

**Report of the
Committee appointed to inquire into and
report on the state of primary education
of boys of the Muslim community and
of educationally backward commu-
nities in the United Provinces.**

ALLAHABAD :
The Superintendent, Government Press, United Provinces
1930

Report of the Committee appointed to inquire into and report on the state of primary education of boys of the Muslim community and of educationally backward communities in the United Provinces.

1. The Primary Education Inquiry Committee appointed under G. O. no. C.78/XV, dated June 12, 1925, met for the first time on August 28, 1925; subsequent meetings were held on August 29 and 31, 1925, February 15 to 19, March 8 to 10 and 20, and August 1, 1926. The delay in producing a report has in the main been due to the difficulty of collecting the members at any one time on account of their professional and political calls. Many have responded on occasion in spite of great inconvenience and even loss.

2. The terms of reference were as follows :—

- (a) to inquire into and report on the state of primary education of boys of the Muslim community in the United Provinces with a view to bringing them up to the general level ; and
- (b) to inquire into and report on the state of primary education of boys of educationally backward communities in the United Provinces with a view to bringing them up to the general level.

From the beginning of the committee's sittings the wording of the terms of reference, and especially the term "general level," has seriously threatened to terminate its discussions, but the unanimous desire to arrive at some useful conclusions has more than counterbalanced feelings upon communal differences. In order to elucidate the difficulties under which the committee laboured it would be as well to explain the views held by different parties.

The Muhammadan gentlemen on the committee held that the wording of the terms of reference assumed the backwardness of the Muhammadan community, and that the second of the terms of reference connoted two distinct divisions of the Hindu community.

The Hindu gentlemen were prepared to show by statistics that the Muhammadan community both in urban and rural areas was numerically advanced, but refused to concede that the depressed classes were outside of the Hindu community. They maintained that within the Muhammadan community there were distinctions as marked as those between the advanced and the backward sections of the Hindu community.

3. Since there never could be any possibility of change of view in these matters of conviction, it was decided to proceed first with inquiry into the present educational condition of the Muhammadan community and of the depressed classes. With a view to ascertaining the views of non-official and official gentlemen interested in education two questionnaires were issued (see Appendix A). One dealing with Muhammadan primary education was sent to eight Muhammadan gentlemen and two

representative bodies and answers were received in time for consideration from eight gentlemen and one representative body. That dealing with primary education of the educationally backward communities was sent to fourteen non-Muslim gentlemen and one representative body and answers were received in time from eight gentlemen and one representative body.

4. Selection was made of the following gentlemen, who very kindly appeared as witnesses before the committee :—

(a) *Official witnesses.*

- (1) M. Wahidul Hasan, B.A., I.T., Deputy Inspector of Muhammadan Schools, Fyzabad division.
- (2) Saiyid Alay Ali Naqvi, M.A., Deputy Inspector of Schools, Moradabad.
- (3) Rai Sahib Pandit Raj Narayan Misra, B.A., C.T., Registrar, Board of Revenue, United Provinces, Allahabad.

(b) *Non-official witnesses.*

- (1) M. Muhammad Husain Sahib, Member, District Board, Jaunpur.
- (2) Dr. Shafa'at Ahmad Khan, M.A., Litt. D., M.L.C., Professor of History, Allahabad University, Allahabad.
- (3) M. Zahur Ahmad Sahib, B.A., LL.B., late Vice-Chairman, Municipal Board, Lucknow.
- (4) Babu Khem Chand Sahib, M.L.C., Shahganj, Agra.
- (5) Pandit Rama Kant Malaviya Sahib, B.A., LL.B., George Town, Allahabad.
- (6) Chaudhri Mukhtar Singh, Pleader, Meerut.

5. The nature of the issues at stake was such as lent itself to the appearance of majority and minority reports. The committee felt that such reports would be of little value and has attempted to arrive at unanimous conclusions. There were some matters of sufficient importance for record in the body of the report upon which there was irreconcilable difference of opinion, and in such cases the names of dissentients are given.

6. The committee accepted the Chairman's interpretation of the term "general level" as applied (a) to the number of boys receiving primary education, (b) to the quality of the education given. In the first case the basis of calculation should be the percentage of boys of all communities taken together in attendance at primary schools of all kinds to the total male population, and in the second case the standard of quality should be the average standard in primary schools maintained by district and municipal boards.

The figures accepted by the committee were those supplied in the returns of the Education department and in the Census report. Dr. Zia-ud-din, Khan Bahadur Hafiz Hidayat Husain and Khan Bahadur Masudul Hasan were of opinion that the large number included with the Hindu population but classed as "depressed" should not be taken into reckoning for purposes of comparison as very few were literate. Some members considered that boys in attendance at unrecognized

maktabs and pathshalas should not be counted as their recitation of Suras and Slokas did not lead to literacy.

NOTE.—Rai Bahadur Thakur Mashal Singh,
Pandit Venkatesh Narayan Tiwary,
Rai Sahib Pandit Sukhdeo Tiwari, and
Pandit Nanak Chand

held that even if the boys of the depressed classes were excluded, the percentage of Muslim boys at school was higher than that of the boys belonging to the high caste Hindus.

7. *Muhammadan primary education.*—Having accepted the Chairman's interpretation, the committee agreed that according to numerical calculation the male Muhammadan community was not educationally backward in comparison with the total male population of the United Provinces. It was not possible to estimate from the answers to the questionnaire or the evidence of witnesses exactly how far the numerical superiority had been promoted by the institution of special schools such as maktabs and Islamia schools, but some of the evidence showed that maktabs had attracted boys who, but for their existence, would not have attended school at all, partly because of the facilities for religious instruction offered in them and partly on account of the personal influence of the teachers, who depend upon their continuance for a livelihood.

8. The committee recognizes the fact that in quality the education given in special Muhammadan institutions is inferior to that given in ordinary mixed schools maintained by municipal and district boards. The gravity of the situation was realized when it was understood that 33 per cent. of the Muslim boys receiving primary education are enrolled in Islamia schools and maktabs.

The committee attributes the failure of the majority of maktabs and Islamia schools to the following causes:—

- (a) the unwillingness of boards in straitened circumstances to expend money from their own funds on inferior denominational schools;
- (b) lack of healthy competition, incidental to their sheltered condition;
- (c) inferior tuition;
- (d) insufficient and over-lenient inspection.

NOTE.—The note submitted by the President and M. Said-ud-din Khan is given in Appendix G.

9. The committee is unanimous in accepting the ideal of a single type of mixed school maintained by the municipal and district boards as the most economic medium of primary education and the most suitable for the promotion of co-operative self-government.

10. The Muhammadan members agreed to consider the abolition of the Islamia schools only on the following conditions that in boards mixed schools—

- (a) opportunity was given for religious instruction,
 - (b) adequate provision was made for the teaching of Urdu, and
 - (c) sufficient Muhammadan teachers were employed.
- (a) There is no lack of evidence as to the universal desire of all communities for religious instruction in schools. Years ago it found

expression in the demand among Muhammadans for Islamia schools and makhtabs; more recently among Hindus there has been a similar demand for increase in the number of pathshalas. The written answers to the committee's questionnaire and the oral replies of witnesses both attribute the unpopularity of the board's schools to the fact that only secular education is given in them. The committee, therefore, recommends with a view to the gradual elimination of special schools—

- (i) that denominational religious instruction be given within school hours in all schools maintained by district and municipal boards;
- (ii) that each religious community should determine what religious instruction should be given to boys of that community and should pay for it;
- (iii) that the time for religious instruction should not exceed three periods a week;
- (iv) that local advisory committees of the denomination concerned should appoint suitable teachers to give religious instruction either from among members of the school staff or from other sources;
- (v) that all boys should attend the classes for religious instruction unless withdrawn by their guardians;
- (vi) that no ritual should be performed within the school premises;
- (vii) that the grouping of several classes for religious instruction should be permitted.

The majority of the committee was of opinion that it was the duty of the particular community to arrange for payment for religious instruction. Rao Sahib Rao Abdul Hamid Khan, Dr. Zia-ud-din and Khan Bahadur Masudul Hasan thought that allowances for imparting religious instruction to Muhammadan boys should be given out of a cess levied on Muslim landholders and tax-payers for this purpose. The majority was not in favour of the suggestion.

(b) The committee having expressed its opinion that the protection of Urdu and Hindi teaching was essential of the success and popularity of boards' schools, recommends as a first step the revision of both Urdu and Hindi readers. The readers in both scripts should contain the same matter, but there should be a wider range in the passages selected including biographical narratives upon national heroes and benefactors of all creeds. The members are agreed that primary school teaching is useless unless literacy can be maintained afterwards and recommends more liberal subsidization of village libraries and local news sheets, of reading societies conducted by village teachers and other literates, of translations from European languages into Urdu and Hindi. They further recommend, as an incentive to the study of Urdu and Hindi by teachers, that pecuniary rewards be given for success in the Advanced Language Examinations.

(c) The question of fair representation of Muhammadans on teaching and inspecting staff gave rise to much discussion, but the members were unable to arrive at an unanimous conclusion. Dr. Zia-ud-din in a separate note suggests a proportion of 25 per cent. in district and 30 per cent. in municipal schools. Khan Bahadur Masudul Hasan suggested that the

fixing of a proportion should be left to the Local Government. Rai Bahadur Thakur Mashal Singh suggested and a majority favoured the suggestion that in the event of a proportion being fixed, it should be on the population basis of various communities. The majority, however, was averse from fixing a proportion on the ground that it was to the interest of the district and municipal boards to maintain a fair representation.

In this connexion the committee give consideration to the facilities for training that are available for Muhammadan students. Some witnesses laid stress on the lack of hostel accommodation for Musalmans in middle schools which, it was averred, prevented Muslim boys from preparing for entrance through the Vernacular Final Examination to the training institutions, and on the failure of some boards to find Muhammadan candidates for these institutions. Most members considered that insufficient stress was laid upon the reluctance of Muslim boys to enter the teaching profession. The committee recommends that equal facilities should be given in every middle school hostel for Muhammadan and Hindu boys, provided, in the case of the minority, that the cost is not out of all proportion to the numbers.

The committee recommends the elimination of separate inspecting staffs for different communities without prejudice to the careers of existing members of these staffs.

11. While recommending the ultimate adoption of a single type of mixed school under the control of the boards, the committee recognizes the undesirability of summary abolition of Islamia schools and aided maktabs.

12. Notwithstanding the inferior character of the education given in the majority of aided maktabs, it recommends the retention for some years, subject to certain conditions, of a limited number, because maktabs make an appeal to parents in certain sections of the Muhammadan population where there is strong prejudice against secular education.

13. The condition recommended by the committee for aided schools of all kinds, including maktabs and pathshalas, are as follows :—

- (a) That every such school should have a properly constituted managing committee recognized by the district and municipal boards within whose jurisdiction the school is situated.
- (b) That district and municipal boards should have powers of inspection through their own inspecting staff.
- (c) That boards should be able to insist on the proper maintenance and check of accounts and should have power of obtaining rents and statements.
- (d) That the managing committee should guarantee an enrolment of 20 pupils and an attendance of 75 per cent. which in the case of communal schools should be of the community concerned.
- (e) That in the future no teacher should be appointed whose qualification is less than a Vernacular Final certificate.
- (f) That the minimum pay of a teacher be Rs. 12 (exclusive of any amount paid for giving religious instruction).

- (g) That after March 31, 1927, when the present compact with the district boards comes to an end, provision be made for the payment of P. T. C. teachers and untrained teachers be no longer engaged.
- (h) That any special arrangement of classes be abandoned and the standards of the board's schools adopted.
- (i) That the syllabus of secular education in special schools be closely approximated to that in use in board's schools, so that pupils may be able to pass freely into ordinary schools and so that ultimately these schools may be taken over by the boards.

14. The question of the retention of Islamia schools or their conversion into ordinary boards' schools was discussed at great length. From written answers given to the questionnaire and from the replies of witnesses it was evident that there was great ignorance among the educated classes of the functions of these schools.

Again and again the President had to point out that Islamia schools do not provide religious teaching within school hours, that their syllabus is exactly the same as that of ordinary boards' school, and that they are maintained entirely by the boards.

The majority of the committee advocates the gradual conversion of Islamia schools into ordinary boards' schools on the recommendations of the district or municipal boards, if divisional inspectors are satisfied that the conversion should take place; provided that—

- (1) satisfactory arrangements are made in the boards' schools for religious instruction within school hours, if possible by school teachers;
- (2) that satisfactory arrangements are made for teaching Urdu;
- (3) that a boy is taught in Urdu or Hindi as his parents desire.

NOTE.—Dr. Zia-ud-din Ahmad, Khan Bahadur Hafiz Hidayat Husain and Khan Bahadur Masudul Hasan agreed with the general principle of gradual conversion, but were not satisfied with the provision. Their notes of dissent are appended.

15. The committee is unanimous in dissatisfaction with the tentative institution of the Islamia training classes—

- (a) because sanction is given to a low standard of education among teachers by the admission to the classes of youths who have only passed the primary examination;
- (b) because the teachers trained in them cannot find employment at aided maktabs in competition with untrained Maulvis and are not fit to teach in the boards' schools.

It therefore recommends their discontinuance.

16. The committee considered the question of supplying sufficient qualified Muhammadans to meet the requirements of the boards' schools. Official members expressed their opinion that in most divisions it was extremely difficult to find enough Muhammadan boys of the proper qualifications and reasonable ability to fill vacancies in normal schools and training classes. It was asserted by some that the system

of education was at fault rather than the supply of candidates. It was also put forward that shortage might be due to the lack of proper accommodation for Muhammadan boarders in middle schools. In any case, the question of supply was complicated by discussions of what proportion of Muhammadan teachers should be maintained and by the increasing popularity of the maktab which by attracting Muhammadan boys from boards' schools reduced the necessary proportion of fully qualified Muhammadan teachers, whatever that might be.

The committee is in favour of removing all obstructions that may exist for Muhammadan boys in middle and training schools.

17. The committee recognizes that Muhammadan education committees appointed to advise and assist in all matters concerning Islamia schools and maktab have not been a success. On behalf of these committees it was put forward in evidence, and in answer to the questionnaires that their failure was due to want of power within the boards, while on the other side their failure was attributed to apathy or want of judgment. The committee is not prepared to recommend the delegation of administrative powers to an advisory committee or to accept the suggestion that any denominational committee should have equality with the educational sub-committee chosen within the board. It was, however, recommended that denominational advisory committees should be continually consulted by district and municipal boards in all matters of special concern to the community which they represent, and that due consideration should be given to their opinions. In the event of the principle of religious education within school hours in all boards' schools being accepted, the work of the advisory committees in selecting and recommending teachers of religion would be one requiring constant attention to, and accurate knowledge of local conditions.

18. The committee was unable to arrive at a unanimous conclusion with regard to the opinion of Muhammadan education committees, Muhammadans as represented by the opinion of Dr. Zia-ud-din, Khan Bahadur Masudul Hasan and Khan Bahadur Hafiz Hidayat Husain were in favour of the retention of rule 74 of the District Board Educational Rules in its entirety. Hindu opinion, which was in the majority on the occasion, was expressed in an amendment to the rule that "the Chairman of the Muslim advisory committee should be elected by the Muslim members of the board, but he should be nominated by the District Magistrate when the Muslim members failed to elect a Chairman within the prescribed time." The committee was unanimous in recommending that the Secretary of the Muslim advisory committee should be a Muhammadan sub-deputy inspector of schools.

Primary education of the depressed classes.

19. The evidence before the committee showed that the educational backwardness of the depressed classes was due as much, if not more, to economic causes as to social prejudice.

The remuneration in certain occupations has until now been so low that it has been found impossible for families in depressed classes to do without the earnings of children. The improved rewards of recent years have to a small extent created ambition, but their chief result has been to increase the avidity of parents.

The nature of their occupation has not, up to the present, demanded literacy, which is actually considered by illiterate parents as a disability.

Employers of unskilled labourers have no desire to raise literacy among their employees and create discontent. The literate members of other castes and communities are averse from increasing literacy in the depressed classes for fear of competition for the posts of patwaris, school masters, etc.

20. These economic causes combined with strong social prejudices have resulted in local opposition to the foundation of special schools, which usually shows itself in refusal to supply a house or ground for the school on the part of owners of property. In places where accommodation has been found common methods of breaking up schools are to threaten parents or pupils with dismissal from employment and to make the teacher so uncomfortable that he resigns.

21. That the social prejudice is giving way is shown by the admission in recent years of untouchables to ordinary boards' schools in considerable numbers and the attendance of boys of high castes in schools for the depressed classes. According to some witnesses this is due to the effects of certain religious bodies that have definitely taken up the elevation of untouchables as a duty; according to others it is a sign of a better standard of living among depressed communities.

22. The committee reiterates its belief in the ideal of a single type of school maintained by district and municipal boards for all communities and recommends a policy with regard to the education of the depressed classes that will lead to the realization of this ideal.

23. It recognizes first and foremost that the elevation of the depressed classes and their conversion to literacy can only be accomplished by removal of the stigma upon them and the stimulation of their aspirations.

24. For the removal of this stigma it recommends, wherever possible, the establishment of ordinary boards' schools in areas occupied by members of these classes rather than the creation of ignominiously labelled depressed class schools. Where the distribution of classes does not permit of such arrangement, it recommends extra remuneration to teachers who succeed in maintaining a regular attendance of boys from the depressed classes.

It recommends the preservation of special schools in such places where there is definite opposition to the admission of boys of the depressed classes to ordinary schools.

25. To stimulate aspiration the committee recognizes that opportunities must be given to boys of the depressed classes to attain education beyond the primary stage so that they may become missionaries of the cause of education among their own people.

It therefore recommends the removal of all obstacles to the admission of boys of the depressed classes in middle schools, training classes and normal schools, so that the profession of teaching may be open to them. To this end, as a special measure, a limited number of scholarships should be given in each district by the Government through the district board

to boys of sufficient worth, to enable clever boys of the depressed classes to pay for education, food and clothing during a course at middle and training schools. The right and not merely the privilege of accommodation for residence and cooking should be insisted upon for such scholars.

The committee also recommends for a time the retention of the men of the standing of the present supervisors, but belonging to the depressed classes, to preach the necessity of literacy throughout the district. They should not have inspecting powers, but should be more of attendance officers.

It recommends the employment of one attendance officer from the depressed classes in each municipality which has adopted free and compulsory education.

It also recommends the constitution of advisory committees of the depressed classes, wherever it is possible, to voice the opinion of the particular sections of the community.

26. In order to overcome the prejudice of parents against education as detrimental to efficiency for manual work, the committee recommends such revision of curricula and methods as will bring school work into closer association with the home life of students and their parents' occupations, and that substantial Government aid be given to approved experiments, towards giving a vocational bias to education in town and country by private and public bodies.

27. The committee recognizes that one serious imperfection of the present teaching in primary schools is the lack of skill among teachers of preparatory classes, which results in serious delay in acquiring the elements of reading and writing, and ultimately discourages parents of the labouring classes from sending their children to schools.

It therefore recommends that immediate action be taken by the Board of Vernacular Education and the department of Public Instruction towards the revision of the course of training teachers in primary school with special reference to the following points:—

- (a) the testing of children at the time of admission for purposes of grading;
- (b) the creation of decent habits in children;
- (c) the maintenance of interest amongst infants;
- (d) the association of home and school experience whilst acquiring the elements of reading, writing and arithmetic;
- (e) the organization of work and play in relation to time.

28. The committee regrets that a great deterrent to the attendance of children of the backward classes is the attitude of the majority of teachers in primary schools with regard to punctuality, energy, honesty in maintaining records, attendance, etc. It recommends to boards the adoption of a more stringent disciplinary policy and the maintenance of the authority of the local inspecting staff.

29. It recommends that better opportunities of special training in method of teaching and of organization in primary schools should be given to all men who are appointed to sub-deputy inspectorships. It considers that ignorance of their business in officers of the inspecting

staff is intolerable, as these officers are the only persons through whom primary teachers can keep in touch with educational progress; and also because it is impossible for inspectors to command the respect of teachers or of their boards unless they are experts in their profession.

30. The committee recommends the adaptation of school times, seasonal and diurnal, to the needs of the working class population.

In areas where free and compulsory education has been adopted it recommends evening classes for children in the upper primary stage who have to help their parents in the day time. Such classes, it believes, can be started with great advantage in towns and large villages under reliable teachers; provided that suitable arrangements can be made for lighting and warming.

31. The committee recommends the institution of adult night schools in suitable areas in towns and large villages.

32. The committee recommends the introduction of further legislation to safeguard the interests of juvenile employees.

33. The committee realizes the existing difficulty in staffing depressed class schools. It is averse from a policy of introducing men of poor qualifications into such schools as tending to perpetuate special institutions of a low standard. It considers that such schools or the ordinary schools which will take their place, situated in the midst of a depressed class population, should be largely staffed by masters from the depressed classes as soon as such teachers are available.

34. The committee was in favour of the establishment of advisory committees for the depressed classes in municipalities and districts to advise and assist the boards in educational matters concerning depressed class schools. It recommends by a majority that the Chairman of the advisory committee should be elected by the members. Khan Bahadur Masudul Hasan, Khan Bahadur Hafiz Hidayat Husain and Dr. Zia-ud-din were of opinion that the Chairman should be nominated by the District Magistrate.

35. The question of advisory committees to assist and advise in matters connected with education in aided schools partly maintained by the Hindu and Christian communities was discussed. With regard to the former a majority of the committee recommended that there should be within each district or municipal area a Hindu education committee consisting of not less than five members, who should be elected by the Hindu members of the board concerned; that the Chairman and Secretary of the advisory committee should hold office for three years and should be eligible for re-election; that the committee should advise and assist the board in all matters concerning "pathshalas"; that the board might delegate to this committee the power to allot funds within the budget allotment for the purpose of grant-in-aid to pathshalas. Dissentient were Khan Bahadur Masudul Hasan, Khan Bahadur Hafiz Hidayat Husain and Dr. Zia-ud-din.

The committee unanimously accepted the proposal that members of the Christian educational advisory committees should be appointed by a local committee nominated by the Provincial Council of Missions of the United Provinces, and that the officer of the committee be elected by its members.

36. The committee desires to place on record its appreciation of the services of its Secretaries—

Mr. A. K. Majumdar, and
Mr. W. A. Nicoll.

NOTE.—A copy of the report was forwarded to Canon Crosthwaite in England who has cabled his approbation.

H. B. WETHERILL (*President*).
* ZIA-UD-DIN AHMAD.
SAID-UD-DIN KHAN.
* RAO ABDUL HAMID KHAN.
* HIDAYAT HUSAIN.
† MASHAL SINGH.
† SUKHDEO TIWARI.
† NANAK CHAND.
† VENKATESH NARAYAN TIVARY.
† SHEORAJ SINGH.
‡ MASUDUL HASAN.

* Subject to note of dissent.

† Subject to an explanatory note.

‡ Subject to the notes of dissent.

APPENDIX A.
PRIMARY EDUCATION QUESTIONNAIRES.

A.—Muslim.

1. Do you consider the education of the Muhammadan community to be in a state of backwardness? If so, what are the causes?
2. What are the defects in the existing system of Muslim education? What improvements do you suggest with regard to—
 - (a) Text-books (secular and religious);
 - (b) method of teaching;
 - (c) staff (qualifications, salaries, etc.);
 - (d) inspecting agencies;
 - (e) recurring and non-recurring grants?
3. What are your opinions with regard to half-time and night schools in urban and rural areas?
4. Have you experienced any difficulties in securing aid for Islamia schools and maktabas? If so, what remedies do you suggest?
5. Will you express your opinion on Islamia training classes?
6. Are you in favour of retention of both Islamia schools and maktabas? If not, which would you retain?
7. What, in your opinion, are the reasons for the lack of interest shown by Muhammadan educational committees?
8. What special suggestions would you put forward to make primary education popular and useful—(a) in villages, (b) in towns, in educationally backward sections of the Muslim community?
9. Is there any objection on the part of Muslim parents to their children attending mixed schools?
10. What general measures do you suggest for the development of primary education among Muslim boys?

B.—Educationally backward communities.

1. Do you consider the education of the Hindu community to be in a state of backwardness? If so, what in your opinion are the causes?
2. Do you consider the existing system to be defective or not from the point of view of the Hindu community? If so, in what respects?
3. What improvements do you suggest with regard to—
 - (a) Text-books (secular and religious);
 - (b) method of teaching;
 - (c) staff (qualifications, salary, etc.);
 - (d) inspecting agencies;
 - (e) recurring and non-recurring grants?
- 3(a). What are your opinions with regard to half-time, whole-time and night schools in urban and rural areas?
4. Have you experienced any difficulties in securing aid for schools or pathshalas for the education of backward classes?

5. What special suggestions would you put forward to make education popular and useful,—(a) in villages, (b) in towns, for boys belonging to the educationally backward and depressed classes of the Hindu community ?

6. What causes do you assign to the sparse attendance at mixed schools, pathshalas, and depressed class schools of boys belonging to (a) the depressed classes, (b) other educationally backward sections of the Hindu community ?

7. Do you consider that the schools especially meant for the depressed classes are—

(a) Sufficient in number;

(b) suitable in character ?

If not, what improvements do you suggest ?

8. Should more pathshalas or schools be started for the educationally backward sections of (a) the Hindus, (b) the Christians ? If so, of what character should they be ?

9. What steps other than the establishment of separate schools or pathshalas for (a) depressed classes, (b) educationally backward classes, of the Hindu community do you propose in order to bring these classes up to a general level ?

10. Do you consider that such teaching as is now imparted in primary schools adds to or decrease, the efficiency of (a) town, (b) village, boys in their hereditary occupations ? In the latter case what remedies do you propose ?

11. Are any other facilities necessary to attract a larger number of boys from educationally backward classes to the schools ?

12. Are you in favour of Hindu boys (including those belonging to the backward and depressed classes) receiving instruction in schools meant primarily for Muslim boys ? If not, please state your reasons ?

13. Do you consider that the schools or pathshalas meant for the boys of the backward and depressed classes of the Hindu community should be staffed by non-Hindu teachers ? If not, please state your reasons ?

14. Are difficulties experienced by boys of the depressed classes in obtaining admission to Government and aided schools ?

15. Would you suggest the institution of pathshala training classes ?

16. Have the special arrangements for *mahajani* teaching in mixed schools been successful ? If not, do you suggest the starting or aiding of separate *mahajani* schools ?

17. What suggestions, if any, have you to make for the benefit of primary education among Hindus ?

18. What special steps do you think should be taken to improve the education of educationally backward classes ?

APPENDIX B.

| Year. | Total enrolment in vernacular primary schools. | Total number of Muhammadan boys on roll in all kinds of vernacular primary schools. | Percentage. |
|-------|--|---|-------------|
| 1920 | 759,097* | 136,662 | 18'00 |
| 1921 | 804,870* | 138,549 | |
| 1922 | 787,376* | 139,461 | 17'7 |
| 1923 | 831,964* | 142,843 | |
| 1924 | 835,572* | 170,453 | 19'2 |

*From Appendix "B" of Director of Public Instruction's report for the respective years.

(a) Page 27 of report for 1920-21.

(b) Page 35 ditto 1922-23.

(c) Page 32 ditto 1923-24.

APPENDIX B.

| District. | Total male population. | | | Muslim male population. | | | Percentage of Muslim population to total male population. | | | Total number of scholars in Primary schools. | | Number of Muslim scholars. | | Percentage of Muslim scholars to total scholars. | |
|------------------|------------------------|------------------|-------------|-------------------------|------------------|-------------|---|------------------|-------------|--|------------------|----------------------------|------------------|--|------------------|
| | District board. | Municipal board. | Cantonment. | District board. | Municipal board. | Cantonment. | District board. | Municipal board. | Cantonment. | District board. | Municipal board. | District board. | Municipal board. | District board. | Municipal board. |
| Dehra Dun .. | 87,867 | 26,767 | 13,542 | 9,246 | 7,398 | 2,530 | 10.5 | 27.6 | 18.7 | 3,790 | 308 | 573 | 106 | 15.4 | 33.0 |
| Saharanpur .. | 440,562 | 71,721 | 3,625 | 135,198 | 31,360 | 1,262 | 30.7 | 43.7 | 34.8 | 15,275 | 5,201 | 5,998 | 3,439 | 39.3 | 66.1 |
| Muzaffarnagar .. | 411,791 | 22,516 | .. | 111,447 | 10,614 | .. | 27.0 | 4.1 | .. | 14,120 | 272 | 3,414 | 83 | 24.2 | 30.5 |
| Meerut .. | 719,864 | 61,266 | 28,864 | 147,523 | 23,613 | 9,248 | 20.5 | 43.4 | 32.0 | 33,980 | 2,402 | 6,664 | 1,353 | 19.6 | 56.8 |
| Bulandshahr .. | 528,502 | 34,027 | .. | 90,071 | 14,157 | .. | 17.0 | 41.6 | .. | 15,870 | 1,202 | 2,593 | 191 | 16.3 | 15.0 |
| Aligarh .. | 504,972 | 71,307 | .. | 48,510 | 23,302 | .. | 9.6 | 32.7 | .. | 18,172 | 1,802 | 1,614 | 812 | 8.9 | 45.0 |
| Muttra .. | 303,835 | 31,034 | 6,231 | 26,275 | 4,761 | 1,498 | 8.6 | 15.3 | 24.0 | 12,041 | 2,278 | 774 | 589 | 6.4 | 25.9 |
| Agra .. | 393,007 | 102,053 | 13,223 | 24,932 | 32,232 | 2,253 | 6.3 | 31.6 | 24.6 | 17,888 | 4,227 | 1,234 | 1,430 | 6.8 | 33.8 |
| Mainpuri .. | 403,975 | 8,036 | .. | 19,303 | 1,793 | .. | 4.8 | 22.4 | .. | 14,800 | 255 | 1,130 | 70 | 7.6 | 27.5 |
| Etah .. | 422,056 | 27,106 | .. | 38,475 | 8,275 | .. | 9.1 | 30.5 | .. | 12,963 | 1,326 | 1,274 | 252 | 9.8 | 19.0 |
| Bareilly .. | 473,655 | 61,068 | 7,162 | 106,823 | 30,406 | 1,496 | 22.6 | 47.5 | 20.9 | 10,035 | 5,651 | 3,812 | 2,747 | 37.8 | 43.6 |
| Bijnor .. | 350,706 | 28,937 | .. | 114,312 | 22,676 | .. | 32.7 | 58.2 | .. | 15,853 | 893 | 7,064 | 722 | 44.6 | 81.8 |
| Budaun .. | 492,357 | 35,466 | .. | 70,085 | 18,041 | .. | 14.2 | 50.9 | .. | 11,866 | 1,044 | 2,855 | 700 | 23.9 | 67.0 |
| Moradabad .. | 538,832 | 100,190 | .. | 170,174 | 58,742 | .. | 31.6 | 58.6 | .. | 16,465 | 4,551 | 5,669 | 4,069 | 34.4 | 89.4 |
| Shahjahanpur .. | 406,170 | 46,667 | .. | 12,579 | 25,132 | .. | 10.5 | 53.9 | .. | 14,340 | 1,642 | 2,481 | 1,580 | 17.3 | 96.2 |
| Pilibhit .. | 207,600 | 21,530 | .. | 31,816 | 8,895 | .. | 15.3 | 41.3 | .. | 6,253 | 763 | 1,543 | 599 | 24.7 | 78.5 |
| Farrukhabad .. | 431,153 | 36,006 | 1,845 | 40,996 | 10,954 | 480 | 9.5 | 30.4 | 26.0 | 17,473 | 1,124 | 2,330 | 472 | 13.3 | 42.0 |
| Etawah .. | 381,354 | 22,469 | .. | 16,326 | 6,585 | .. | 4.3 | 29.3 | .. | 16,126 | 1,955 | 1,043 | 256 | 6.5 | 18.9 |
| Cawnpore .. | 507,555 | 116,411 | 13,353 | 29,869 | 29,471 | 3,571 | 5.9 | 25.3 | 26.7 | 22,716 | 4,327 | 1,642 | 1,714 | 7.2 | 39.6 |
| Fatehpur .. | 333,730 | 7,797 | .. | 34,728 | 3,588 | .. | 10.4 | 46.2 | .. | 13,826 | 980 | 1,936 | 130 | 14.0 | 34.2 |
| Allahabad .. | 632,525 | 31,701 | 7,962 | 68,172 | 22,710 | 1,925 | 10.8 | 27.8 | 24.2 | 28,749 | 2,864 | 5,011 | 1,332 | 17.4 | 46.5 |
| Jhansi .. | 265,354 | 40,921 | 8,812 | 7,646 | 7,317 | 2,698 | 2.9 | 19.1 | 30.6 | 11,874 | 1,961 | 833 | 443 | 7.4 | 32.6 |
| Jalaun .. | 195,761 | 17,323 | .. | 9,334 | 4,381 | .. | 4.8 | 24.9 | .. | 10,441 | 1,458 | 928 | 436 | 8.9 | 29.9 |
| Hamirpur .. | 224,389 | .. | .. | 14,071 | .. | .. | 6.3 | .. | .. | 10,161 | .. | 1,436 | .. | 13.6 | .. |
| Banda .. | 303,329 | 10,315 | .. | 15,254 | 2,750 | .. | 5.0 | 26.7 | .. | 13,733 | 808 | 1,337 | 317 | 9.0 | 39.2 |
| Benares .. | 355,530 | 104,204 | 1,954 | 20,061 | 28,689 | 529 | 5.6 | 27.5 | 27.0 | 26,950 | 5,955 | 2,135 | 1,292 | 7.9 | 24.7 |
| Mirzapur .. | 332,961 | 28,674 | .. | 16,531 | 5,436 | .. | 5.0 | 19.0 | .. | 16,144 | 955 | 1,293 | 282 | 8.0 | 29.5 |

APPENDIX B--(concluded).

| District. | Total male population. | | | Muslim male population. | | | Percentage of Muslim population to total male population. | | | Total number of scholars in Primary schools. | | Number of Muslim scholars. | | Percentage of Muslim scholars to total scholars. | |
|-----------------|------------------------|------------------|-------------|-------------------------|------------------|-------------|---|------------------|-------------|--|------------------|----------------------------|------------------|--|------------------|
| | District board. | Municipal board. | Cantonment. | District board. | Municipal board. | Cantonment. | District board. | Municipal board. | Cantonment. | District board. | Municipal board. | District board. | Municipal board. | District board. | Municipal board. |
| Jaunpur .. | 557,104 | 17,376 | .. | 43,499 | 6,496 | .. | 7.8 | 37.4 | .. | 32,339 | 792 | 4,253 | 386 | 13.9 | 42.4 |
| Ghazipur .. | 411,363 | 13,277 | .. | 32,077 | 4,121 | .. | 7.8 | 31.0 | .. | 20,781 | 1,525 | 3,450 | 537 | 16.6 | 35.2 |
| Hallia .. | 416,399 | 10,127 | .. | 24,006 | 1,619 | .. | 5.8 | 16.0 | .. | 26,376 | 194 | 3,423 | 9 | 13.0 | 4.6 |
| Gorakhpur .. | 1,631,355 | 27,237 | .. | 159,917 | 8,926 | .. | 9.8 | 32.8 | .. | 47,331 | 1,063 | 6,249 | 221 | 13.2 | 20.8 |
| Basti .. | 984,741 | .. | .. | 167,210 | .. | .. | 17.0 | .. | .. | 34,368 | .. | 8,977 | .. | 25.0 | .. |
| Azamgarh .. | 767,871 | 8,398 | .. | 89,254 | 2,713 | .. | 11.8 | 32.8 | .. | 25,133 | 177 | 5,627 | 44 | 26.0 | 21.9 |
| Naini Tal .. | 147,592 | 12,616 | 590 | 29,881 | 3,025 | 77 | 20.2 | 24.0 | 13.0 | 6,186 | 562 | 872 | 303 | 14.1 | 54.8 |
| Almora .. | 257,985 | 3,921 | 3,947 | 1,026 | 445 | 369 | 0.4 | 11.3 | 11.0 | 13,626 | 177 | 112 | 40 | 0.8 | 22.6 |
| Garhwal .. | 228,783 | .. | 4,080 | 2,475 | .. | 220 | 1.0 | .. | 5.4 | 12,578 | .. | 147 | .. | 1.1 | .. |
| Lucknow .. | 256,946 | 119,873 | 15,750 | 29,513 | 47,380 | 4,217 | 11.5 | 39.5 | 26.8 | 16,322 | 8,124 | 2,820 | 4,110 | 17.3 | 50.6 |
| Unao .. | 427,239 | 6,374 | .. | 34,469 | 2,426 | .. | 8.0 | 38.0 | .. | 12,394 | 331 | 2,027 | 98 | 16.4 | 28.0 |
| Rae-Bareilly .. | 465,752 | 8,990 | .. | 38,241 | 3,579 | .. | 8.2 | 35.8 | .. | 19,260 | 1,039 | 3,016 | 394 | 15.1 | 37.9 |
| Sitapur .. | 563,081 | 1,871 | .. | 78,542 | 7,729 | .. | 13.9 | 41.6 | .. | 17,112 | 1,201 | 3,426 | 594 | 20.1 | 49.5 |
| Hardoi .. | 560,557 | 25,609 | .. | 51,901 | 10,835 | .. | 9.3 | 42.3 | .. | 21,773 | 1,331 | 2,661 | 80 | 12.2 | 43.8 |
| Kheri .. | 478,054 | 7,123 | .. | 69,068 | 1,911 | .. | 14.4 | 37.0 | .. | 9,778 | 627 | 1,759 | 138 | 18.0 | 22.0 |
| Fyzabad .. | 545,907 | 38,509 | 4,069 | 51,006 | 12,257 | 664 | 9.3 | 31.8 | 16.3 | 19,311 | 1,657 | 3,447 | 563 | 17.9 | 33.8 |
| Gonda .. | 717,070 | 15,826 | .. | 119,913 | 6,275 | .. | 16.3 | 39.6 | .. | 17,707 | 997 | 4,327 | 263 | 24.4 | 26.4 |
| Bahraich .. | 539,832 | 14,716 | .. | 105,238 | 7,762 | .. | 19.5 | 52.7 | .. | 16,037 | 950 | 4,517 | 252 | 28.3 | 26.5 |
| Sultanpur .. | 489,645 | 4,348 | .. | 54,005 | 1,764 | .. | 11.0 | 35.7 | .. | 16,457 | 417 | 3,459 | 273 | 21.0 | 65.5 |
| Partabgarh .. | 413,246 | 4,093 | .. | 44,399 | 1,409 | .. | 10.7 | 34.4 | .. | 17,522 | 306 | 3,260 | 154 | 18.6 | 50.3 |
| Bara Banki .. | 530,076 | 6,820 | .. | 87,694 | 2,994 | .. | 16.7 | 43.9 | .. | 14,059 | 363 | 4,999 | 131 | 35.6 | 36.0 |
| Total .. | 25,060,089 | 1,593,252 | 134,404 | 2,773,661 | 580,457 | 34,033 | 12.6 | 36.4 | 25.3 | 937,934 | 76,030 | 141,974 | 31,677 | 16.9 | 45.6 |

NOTE.—The figures for male population in municipalities and cantonments have been taken from Imperial Table V of Census Report for 1921 Part II.

The figures for male population in district boards have been calculated by deducting the figures for municipalities and cantonments from the total district figures in Imperial Table VI.

The number of total male scholars as well as Muslim male scholars in cantonments is not available.

APPENDIX B—(continued).

Consolidated statement showing enrolment of Hindu and Muhammadan boys in Islamia schools of the United Provinces for 1925-26.

| Number of Islamia schools. | Total enrolment. | Number of Muhammadan boys and girls on roll | | Number of Hindu boys and girls on roll. | | Staff. | Remarks. |
|----------------------------|------------------|---|--------|---|--------|--------|---------------------|
| | | Boys. | Girls. | Boys. | Girls. | | |
| 665 | 24,925 | 21,075 | 24 | 3,773 | 2 | 954 | 51 of other castes. |

Statement showing enrolment of Hindu and Muhammadan boys in maktabas of the United Provinces for 1925-26.

| Number of maktabas. | Total enrolment. | Number of Muhammadan boys on roll. | Number of Hindu boys on roll. | Grant-in-aid. | Remarks. |
|---------------------|------------------|------------------------------------|-------------------------------|------------------------------|---------------------------------------|
| 853 | 29,177 | 27,645 | 1,433 | Ra. 10,017 per mensem. | 99 girls (98 Muhammadan and 1 Hindu). |

APPENDIX B

APPENDIX B—(continued).

Statement showing percentage of Muslim and Hindu boys attending schools to their number of school-going age.

| Year. | Number of boys of school-going age. | | Number of boys attending schools. | | Percentage of boys attending school to the number of school-going age. | | Remarks. |
|---------------|-------------------------------------|--------------|-----------------------------------|--------------|--|--------------|-------------------------------|
| | Hindus. | Muhammadans. | Hindus. | Muhammadans. | Hindus. | Muhammadans. | |
| 1916-17 | *6,038,015 | *998,756 | 660,690 | 152,495 | 10.94 | 15.27 | *According to census of 1911. |
| 1917-18 | *6,038,015 | *998,756 | 677,558 | 156,563 | 11.22 | 15.68 | |
| 1918-19 | *6,038,015 | *998,756 | 673,789 | 159,432 | 11.16 | 15.96 | †According to census of 1921. |
| 1919-20 | *6,038,015 | *998,756 | 732,064 | 172,504 | 12.12 | 17.27 | |
| 1920-21 | †5,791,569 | †972,155 | 763,643 | 178,231 | 13.19 | 18.33 | |
| 1921-22 | †5,791,569 | †972,155 | 754,311 | 169,271 | 13.02 | 17.41 | |
| 1922-23 | †5,791,569 | †972,155 | 824,927 | 178,846 | 14.44 | 18.40 | |
| 1923-24 | †5,791,569 | †972,155 | 876,959 | 195,806 | 15.14 | 20.09 | |
| 1924-25 | †5,791,569 | †972,155 | 891,590 | 203,704 | 15.39 | 20.95 | |
| | | Population. | Hindus. | Muhammadans. | | | |
| | | 1911 | 40,253,433 | 6,658,273 | | | |
| | | 1921 | 38,610,462 | 6,481,032 | | | |

APPENDIX B—(concluded).

Table VIII-B of the United Provinces Census Report.

| | Total males. | Literate males. | Literates per thousand. |
|---------------------------|--------------|-----------------|-------------------------|
| Hindus (page 116) .. | 20,180,814 | 1,248,545 | 62 |
| Muhammadans (page 122) .. | 3,888,161 | 221,503 | 68 |

Statement showing number of Hindu and Muhammadan boys reading in middle vernacular schools in the Allahabad division during the year ending March 31, 1925.

| | Hindus. | Muham- madans. | Total. | Remarks. |
|----------------|---------|-------------------|--------|---|
| Allahabad .. | 980 | 361 | 1,341 | Excludes 147 boys of the primary section of the Model school attached to the Government Normal School, Allahabad. |
| Cawnpore .. | 1,180 | 87 | 1,267 | Includes 35 boys of the middle section of the municipal board English Middle School, Cawnpore. Their caste details being not available the figure could not be omitted. |
| Etawah .. | 1,043 | 69 | 1,112 | |
| Farrukhabad .. | 955 | 138 | 1,093 | |
| Fatehpur .. | 497 | 121 | 618 | |

APPENDIX C.

A short note by Dr. Zia-ud-din Ahmad.

I would consider it unfortunate if any unnecessary controversy as to whether Muslims are or are not educationally backward is raised in this committee. The very fact that this committee has been constituted by Government shows that it has been assumed that the Muslim community like the depressed classes is backward. It will be the duty of this committee to make recommendations for the advancement of the education of boys of the Muslim and other backward communities as it is surely not expected of us merely to report that the Muslims are not below the general level and that, therefore, no recommendations are needed. If we are to submit our recommendations then all disputes as to interpretation of the terms of reference are useless.

I would not summarize comparative figures of illiteracy which have been collected in the statement submitted on behalf of the Provincial Muslim Educational Conference, but I would like to endorse the view that the census figures are far more reliable than figures collected by municipal boards or district boards. In the first place, the machinery employed during census is far more efficient and, in the next, there is not ordinarily any strong motive for making false returns. Whereas the staff employed by municipal boards is not half as efficient, and that employed by district boards is often worse. Furthermore, totals are often based on statements submitted by needy institutions anxious to secure grants-in-aid. Such statements often exaggerate the number of scholars attending school and are permeated by a desire to show that the institution teaches boys of all creeds. Figures submitted under such circumstances are by no means trustworthy. Even the inspecting staffs of municipal and district boards have a tendency to show the progress made under their supervision. Such drawbacks, however, do not exist at census time. The last census was held in 1921, hardly five years ago, and there is no valid justification for not making the recent census figures the working basis of calculation, but being led away by fluctuating figures based on reports received from municipal boards or district boards. If it were necessary to state it I would have no hesitation to say that figures collected by district boards are often far less reliable than those procured by municipal boards.

I would also like to emphasize the point that the number of scholars belonging to a particular community and attending school in any particular year is no true test for determining whether it is or is not backward. The degree of its general illiteracy is a far better criterion of its backwardness. The mere fact that comparatively more scholars are receiving instruction in a particular year cannot show that that community has passed out of the stage of backwardness, as a large proportion may still be uneducated and illiterate.

Sir James Meston's Government got the whole question of Muslim education examined in detail and laid down a well-considered scheme which was embodied in the Government resolutions, dated August 26, 1914. Although those resolutions were put into effect shortly after, the scheme for a long time did not have a fair trial because of the war conditions which prevailed, and later on, because of the rise of the unfortunate non-co-operation movement. For many years the Muslim community did not derive that benefit from it which it ought to have

done under ordinary circumstances. Conditions have improved since 1922 and there are unmistakable signs that Muslims have now awakened and fully realize the importance of the benefit that was intended to be conferred on them. It would be unfortunate if cold water were thrown on their enthusiasm, or if the policy of the Government were to be altered just at the time when the Muslims are about to take advantage of it. No scheme can be condemned before it has had a fair trial. The Government can, therefore, not go back upon its policy in so short a time. Our recommendations should make suggestions for improvements and removal of imperfections, and not for reversal of the policy hitherto adopted. Nothing is likely to rouse more resentment or create greater mistrust than an alteration of the existing policy.

The causes of the backwardness of Muslims in education are manifold, and it is unnecessary to enumerate them. Various recommendations have been summarized in the brief answers to the questionnaires submitted by the Muhammadan Educational Conference, of which printed copies have been circulated. I am in complete agreement with the views expressed by the conference, and I consider that the suggestions are worthy of consideration and deserve to be accepted. In particular I would point out that undoubtedly there are three main grievances existing which have considerably retarded the growth of Muslim education—

- (a) Applications for grants-in-aid made to boards are not considered sympathetically, and are kept pending for an unduly long time and then on adverse reports of the inspecting staff are in most cases rejected.
- (b) In many mixed schools maintained by boards there are no facilities for teaching Urdu, which circumstance deters Muslim parents from sending their boys to such schools.
- (c) Very often the teachers are not sympathetic towards the Muslim students, and certainly do not encourage or induce Muslim parents to send their boys to school.

These grievances can be removed by—

- (a) An increase in the powers of the Muslim Educational Committees so as to give them an effective voice in the matter of grants.
- (b) An adequate Muslim representation in the supervisory staff, and
- (c) An adequate Muslim representation in the teaching staff.

I, therefore, formulate the following proposals under these three heads for the consideration of the committee:—

A. (1) The status of Muhammadan Educational Committees should be raised and some power of supervision over the grants earmarked for Muhammadan education be given to them.

2) Care should be taken to select men of education and position in the district as members.

(3) Meetings of the committees should be held at offices of the district boards and not at the residence of the chairman, and one clerk should be specially attached to each committee.

(4) The existing rule no. 75 directing boards to open Islamia schools where an attendance of 20 boys is guaranteed should be strictly enforced.

(5) An extension of rule no. 73 to maktabas.

(6) Resolutions of such committees should also be forwarded to the office of Inspector of Muhammadan Schools who should be kept in touch with their views.

(7) Before minimum grants for Muslim education are fixed the Inspector of Muhammadan Schools should call for estimates from Muhammadan Educational Committees and submit them to the Education Department.

(8) The present minima should be raised as they are inadequate, and are erroneously treated by many boards as the maxima.

B. An adequate Muslim representation in the governing staff can be secured by—

(1) the maintenance of a Muhammadan Assistant Director in the Education Department,

(2) the filling up of the post of the Inspector of Muhammadan Schools,

(3) an increase in the number of deputy inspectors for Muhammadan schools in divisions where there are more than 70 schools for each such deputy inspector,

(4) the appointment of a Muslim supervisor for Muslim schools in each, district,

(5) an increase of Muslim element in the divisional inspecting staff.

C. Complaints as regards teaching may be removed by—

(1) an increase in the number of Muslim teachers employed in the mixed schools,

(2) seeing that facilities for teaching Urdu exist,

(3) reservation of an adequate proportion of scholarships and free-ships for poor Muslim students,

and, lastly, (4) the imparting of religious instruction through the Muslim teachers employed.

ZIA-UD-DIN AHMAD.

APPENDIX D.

A note by Dr. Zia-ud-din Ahmad.

After passing the Primary Education Bill, the question whether Mussalmans comparatively are or are not backward is not very important. We should attempt to educate and educate efficiently all the children belonging to any race or creed. But I like to make one observation. The Hindu community for purposes of census consists of two classes: (a) high class Hindus and (b) untouchables.

The literacy among untouchables is admittedly very low and this committee is expected to recommend ways and means for spreading literacy among untouchables. With the increase of literacy among the untouchables the proportion of literacy among the Hindu community should rise and must rise. Will it not be just to take steps to raise the proportion of literacy among the Mussalmans also?

I don't question in this note that low caste Hindus—chamars and bhangis—are as much Hindus as persons of high castes such as brahmans and kayasthas.

Hindu community—(a) High class plus (b) untouchables. If the proportion of literacy among (a) and (b) combined is 65 say and among (b), i.e., untouchables, it is considerably lower than 65, then among high class it should be considerably higher than 65. It is this high percentage which we should fix as a common level and try to bring up untouchables on one side and Muslims on the other side to this level.

SECTION II.

The ultimate goal both in education and politics is uniformity. Separate electorate in the Council and local bodies and separate Islamia schools are transitional provisions and they will disappear as soon as the majority communities have realized that it was their duty and not the duty of the Government to safeguard the interests of the minorities. Under the existing tension the process of their disappearance must necessarily be slow and we shall proceed cautiously.

I am second to none in my earnestness to get mixed schools and the success will depend upon the generosity of the majority community who have complete and effective control in the boards, in the Educational Department and in the Council.

I agree to the amalgamation of Islamia schools and mixed schools on the following conditions:—

- (1) There should be one common board school for all classes of Hindus and Muhammadans. The Muhammadans have no objection to going to a school in which the boys of low caste Hindus (untouchables) are admitted and to sit side by side with them in spite of the fact that they are called non-Muslims. The Hindus, who insist in calling untouchables as Hindus, are not likely to have any objection in admitting them to other schools. Judging from the resolutions passed by Hindu Mahasabha I anticipate no difficulty in this direction.

- (2) The proportion of Muslim teachers in board schools shall be 25 per cent. and in municipal schools 30 per cent.
- (3) Religious instruction should be given by school teachers during school hours to such Muslim boys whose parents desire to have it. Boys may be withdrawn from the religious lessons by the parents but unless so withdrawn shall be compelled to attend.

If the board or the Council objects to religious instruction being imparted at the expense of common tax-payers, then a small cess may be levied on Muslim tax-payers alone for this specific purpose.

- (4) The provision for teaching Urdu should be made in every mixed school.
- (5) The special benefits and concessions which the teachers and students of any Islamia school may be enjoying should be continued at the time of amalgamation.

It is also desirable that there should be some guarantee that these conditions will be adhered to. This should be done by the introduction of a Bill in the Council.

III.

Whatever the future of Islamia schools may be, whether they may be retained as Islamia schools or be changed into mixed schools, it is necessary that they should be made more efficient. The quality of teaching both in Islamia schools and maktab may be improved. They should be made more efficient to improve their quality and quantity.

Judging from the evidence recorded, the following suggestions are made :—

Notes for recommendations.

I. Introduction and facilities for religious instruction :—

- (1) Maktab readers be introduced in Islamia schools.
- (2) Religious instruction be given during school hours.
- (3) Be given by school teachers.
- (4) In single-teacher school, teacher be provided by the community.
- (5) Courses to be prepared by the Provincial Muslim Education Committee. Teaching of the holy Quran and lessons on morals be also given.

II. *Maktab.*

- (1) Till such time trained and qualified teachers are available, men of lower qualifications be employed and retained.
- (2) There should be a managing committee or a manager.
- (3) Trained teachers should get the same pay as they get in district board schools.
- (4) Training in Normal schools may be too high and, therefore, a central training class in each district for maktab teachers may be established.
- (5) Persian may be introduced in maktab curriculum.
- (6) Grants be provided for equipment, contingencies and capitation (rule 82).

- (7) Adequate allotment for each district to meet needs and requirements of the Muslim community be made under the Government rules.
- (8) No maktab be opened or abolished without the approval of the Muslim Educational Committee.
- (1) Literary course to be the same as in maktab.
- (2) Teachers should have the same grade as in mixed schools.
- (3) Allotments for the developments of these schools should be adequate and present deficiency should be soon made up in consultation with Muslim committee.
- (4) Religious course should be the same as in maktabs and should be compulsory for Muslim students.
- (5) Control should vest in education committee.
- (6) Vocational and agricultural training facilities should be the same as provided for mixed schools.
- (7) Qualifications of teachers should be the same as in boards' schools.
- (8) These schools should be raised wherever possible to upper primary standard.

Teachers.

- (1) Muslim candidates for teachership in boards' schools and candidates for training classes be selected through Muslim Education Committee.
- (2) Proportion of Muslim teachers in mixed primary schools, middle schools, and training institutions be fixed by local Government on the principle of Lucknow Pact.
- (3) Annual returns should show in detail the number of Muslim teachers in each kind of school and grade of service.

Scholarships and exemption.

- (a) Proportion should be fixed.
- (b) Stipends to students of middle schools for serving as teachers.
- (c) Free supply of books and other requisites.

Hostel arrangements for Muslim boys with Muslim superintendents.

Kitchen arrangements should be made for Muslim boys in the hostels attached to middle schools.

Curriculum.

- (1) The Provincial Muslim Text-book Committee should prepare graduated religious tracts for Muslim boys.
- (2) The literary course of special Muslim school be revised and made up to date, without losing sight of the principle adopted in determining the language course of maktab readers.
- (3) Scout course in Urdu be provided.

In Central Training schools facilities for Muslim teachers of special schools be provided.

(26)

Allotment of grants for Muslim schools.

Inspection.

- (1) A whole-time Inspector for Muslim schools.
- (2) Deputy Inspectors for Muslim schools with full power to watch Muslim interests. The duties be fully defined; as regards mixed schools they should be permitted to inspect.
- (3) Supervisor or Sub-Deputy Inspector in each district.

ZIA-UD-DIN AHMAD.

APPENDIX E.

Note on the education of backward communities amongst Christians.

(BY REV. CANON A. CROSTHWAITE.)

Pandit Sukh Deo Tiwari, in his note on the depressed classes and backward communities, has estimated the number of Christian boys attending school at 11 per cent. of the Christian male population of the province. I wish the proportion were so good, but I regret to say that an examination of the tables in the census report and in the Director of Public Instruction's annual report from which the Pandit has obtained his figures for the Hindu, Muhammadan, and depressed classes communities reveals a far less favourable state of affairs. I give below my own computation. It is not possible in the case of any of the communities to confine the statistics to boys attending primary schools, as these figures are not supplied separately, but the element of error will be about the same for all, so that the comparison instituted will still be valid. My figures for Hindus and the depressed classes differ slightly from the Pandit's as he has taken those for Brahmanic Hindus only and 1 for all Hindus, including Aryas:—

| Religion. | Number of males. | Number of boys in school. | Males. | Percentage of boys from 5 to 15 years. |
|--|------------------|---------------------------|--------|--|
| All religions | 23,787,745 | 835,572 | 3·7 | 16·8 |
| Hindus | 20,243,949 | 792,709 | 3·9 | 17·7 |
| Muhammadans | 3,388,151 | 191,095 | 5·6 | 25·4 |
| Depressed classes | 4,717,511 | 72,618 | 1·5 | 6·8 |
| Hindus, excluding the depressed classes. | 15,525,438 | 720,091 | 4·6 | 20·9 |
| Indian Christians | 83,696 | 4,342 | 5·0 | 22·7 |

It will be seen from the above that the Christian community so far from being greatly in advance of others, is only 4 per cent. ahead of Hindus, excluding the depressed classes, and is behind the Muhammadan community by 4 per cent. This, to me, surprising state of things is due to the large influx into the Christian church of members of the depressed classes, who have numerically swamped all others. These figures are confirmed by statistics I have collected independently from the missionary societies working in the provinces, which give practically the same results. The achievements of the Christian church, therefore, is to be measured, not by the comparison of it with the Hindu and Muhammadan communities as a whole, but with the depressed classes from which the vast majority of its members have come. Viewed in this light the raising of the number of boys attending school from the 1·5 per cent. of the depressed classes to the 5 per cent. of the Christian community is evidence that something has already been done towards the uplifting of the educationally backward, and that Government can look with confidence to the Christian church to carry further the work already begun, but it is obvious that a great deal remains to be done, and that the Christian community as a whole cannot yet claim to have escaped from the educationally backward classes.

It seems to me that the recommendations of this committee to Government with regard to the depressed classes and those drawn from them should aim at the accomplishment of three things—(1) The overcoming of the unwillingness of parents to send their boys to school.

This unwillingness is, by universal testimony, very widespread and until education is made compulsory, as, of course, it ought eventually to be, the opposition must be overcome in other ways. (2) We must aim at the evolution of a system which will be so related to the environment of the boys, as to tend both to the fullest development of all their powers, and also to fitting them to render the greatest possible service to the community of which they are members. This point has been well brought out in Government's resolution on the Piggott report, which says:—

“There are two definite objects which it is the clear duty of Government to ensure that its primary schools should fulfil. On the one hand they must not be so designed as necessarily to make the pupils discontented with, and averse from pursuing their ancestral calling which, with the vast majority, are all that they can possibly look to for their maintenance in life. On the other hand, they must give the boys such an education as will have a lasting influence on their intelligence and will equip them better for their work in the world. Any system of primary education, which fails in these respects, is either treachery to the people or the gravest waste of public money or both.”

In these respects, in my opinion, the present system is lamentably defective. It is necessary to devise a better.

(3) A third object must be to give to education a direction which will so improve the economic condition of the community that it will be able to bear the heavy financial strain that the cost of such education will place on the country.

It is held, and rightly, that the main cause of India's poverty is the prevalent illiteracy. But the breaking down of illiteracy will not enrich the country if it floods it with those who are unfitted by defects in the education given them to improve the staple industries of the country, and so add to its wealth.

The solving of the problems involved in the evolving of the type of education required to satisfy these conditions is very difficult, and I would suggest that what is most needed at present is well-thought-out and financially backed experiments, along the lines indicated. I would urge therefore that this committee recommend Government to support with generous grants any body which is prepared to make experiments along these lines, backed by offers of personal service from those who are competent to conduct them and adequate financial support.

The fact that the leading missionary societies recently appointed a rural education commission, composed of some of their best men, to travel over the whole of India and investigate this question and report on the best way of solving the problems involved is evidence that missionaries are seriously facing them. Some of the leading missionary societies have already set aside men and spent a good deal of money in attempting to establish schools, which will accomplish the objects enumerated above and train teachers for them. Others are about to do so. It is not likely that any of us will evolve a school, which will meet all

requirements but I venture to suggest that, in making experiments in this, bodies, which are closely in touch with the people whom it is desired to benefit, and can command the services of many workers who are enthusiasts in the matter, have advantages which a Government department does not possess in the same measure, while in making their experiments, it will be a great advantage to them to have the benefit not only of Government financial support, but of the criticism and guidance of the Government inspecting staff.

My recommendation that "any body which is prepared to make experiments along these lines, backed by offers of personal service from those who are competent to conduct them, and by adequate financial support" should be generously aided, obviously applies to many other bodies besides Christian missionary societies. The Servants of India Society, the Arya Samaj, the Sanatan Dharm, and other Hindu and Muhammadan societies, which seek the amelioration of the condition of the depressed classes and are prepared to comply with the above conditions should be strongly supported.

If this is done, Government will gain by watching our failures and successes and the way will be prepared for the launching of such large schemes as Government alone can carry out, but which, if prematurely attempted entirely at Government expense, might involve it in considerable waste of public funds

ARTHUR CROSTHWAITE.

MORADABAD:
January 15, 1926.

APPENDIX F.

A note on the "depressed classes and backward communities"
by RAI SAHIB PANDIT SUKHDEO TIWARI, B.A.

Spread of education in rural areas in the United Provinces began just after the mutiny when numerous Halkabandi schools were started, a large number of which, however, had to be closed at about the time district boards came into existence, having been found inefficient. As the development of education in any country depends on its special circumstances such as old traditions, public opinion, etc., education both in rural and urban areas here was confined amongst the literary classes only. The backward communities were allowed to remain in ignorance as they were before. The agriculturist and most of the other village crafts thought that they did not require literary education as it was rather a source of hindrance than of any use to their boys who could not take to their different professions at the required age. The high class and literate Hindu communities, particularly the zamindars, discouraged the backward classes to educate their boys as they did not like the latter to become more learned and question their authority over them. The teachers who happened to belong to literate communities did not admit boys of untouchable classes for one reason or another. Only a few boys of Kahars, Ahirs, Nais, etc., were taken in to serve them as menial servants. Although the angle of vision has now changed still I believe that there is a considerable number of high class people who discourage education amongst the backward classes. Therefore special means will have to be adopted for the general spread of education amongst them. So far as I remember it was during the viceroyalty of the late Lord Curzon that a comparative statement was issued showing literacy in British India and on comparison with other provinces this province was found more backward than others. On investigation it was brought to light that no attempt was ever made to educate the depressed and other backward Hindu communities which formed a large percentage of the total Hindu population. As a result of the above inquiry Government sanctioned various grants from time to time for starting and aiding vernacular schools, and it was then that most of the village crafts as apart from literary classes began to be represented in vernacular schools in varying proportions. The Government resolution of 1914 on the report of Justice Piggot's Committee gave an impetus to the spread of education particularly amongst special classes, and led to the opening of depressed class schools. Later on other facilities were provided in the shape of freeships, scholarships, etc., and the appointment of supervisors for this class of schools resulted in an appreciable increase of scholars. Still some of the backward classes particularly those which are designated "untouchables" attend our schools only in negligible numbers.

| Male population in rural and urban area in British territory in the United Provinces. | Number of scholars. | Percentage | Table (Census report) |
|---|---|------------|-----------------------|
| I. Total 23,787,745 | 885,572 (Director of Public Instruction's report, 1924, page 32A.) | 3.7 | VII-70. |

| Male population in rural and urban area in British territory in the United Provinces. | Number of scholars. | Percentage. | Table (Census report) |
|---|-----------------------|-------------|-----------------------|
| 2. Hindus 20,130,814 | 705,119 | 3·4 | VII—78 |
| 3. Muhammadans 9,388,151 | 170,453 | 5·0 | VII—86 |
| 4. Depressed classes 4,717,511 | 23,000 | ·5 | |
| 5. Hindu depressed classes 15,413,303 | 682,119 | 4·4 | |
| 6. Indian Christians 86,273 | 10,000 approximately. | 11·0 | XV—237 |

From the foregoing table, it would be seen that literacy for the total population of all religions is 3·7. Christians head the list with a percentage of about 11. Muhammadans come the second with 5 per cent., and Hindus stand at the bottom with only 3·4 per cent. If the Hindu depressed or untouchable classes are separated from the total Hindu population, then the percentage rises to 4·4, but remains still below that of Muhammadans and the depressed classes show a percentage of ·5 only. Thus education amongst the latter is deplorably low and needs special attention of the Government and the public bodies. From the information received through the Director of Public Instruction the number of Muhammadan boys exceeds the number of Hindu boys on population basis in 30 districts. It is only 18 districts which show an increase of Hindu boys over Muhammadan. From the last annual report it will be seen that Hindus increased only by 6·2 per cent. (as compared with the preceding year) whereas Muhammadans showed an increase of 9·3 per cent. From the above it would appear that the peoples of all religions in these provinces are more backward than those in other British provinces but comparatively speaking it is the Hindus who are more backward than the Muhammadans so far as these provinces are concerned, and amongst the Hindus the untouchable classes are far behind. I would therefore make the following suggestions for the spread of education amongst the latter :—

- (1) That separate pathshalas like maktabs and Islamia schools be opened for the education of the backward and untouchable Hindu communities.
- (2) That their management be entrusted to various Hindu Samities as Arya Samaj, Dharam Samaj, Seva Samities, etc., with a general control by the district boards.
- (3) Teachers of such schools, so far as possible, be required to be all Hindus and preferably of the class which contributes the majority of the boys. Maktabs and Islamia schools seem to have done well for the spread of Muhammadan education as with one exception all the teachers in them (1913) are Muhammadans.
- (4) Special curriculum for these schools will have to be framed for the teaching of important subjects, i.e., the three R's. Graded text books dealing among others with such subjects as agriculture with all its branches (cattle-breeding and dairy keeping, vegetable growing, gardening, etc.) village manufactures (carpenter's, smith's, and potter's work, etc.) etc., will be needed to attract more boys and to create an interest in them for future vocational training, and will take the place of nature study lessons. Ramayana, works of Kabir, Rahdaa,

etc., have a great hold on them and if introduced these books will lead to the popularity of the schools, or separate graded religious books may be prepared for their use. A chapter on their rights over their fields, etc., functions of patwaris and chaukidars, will be very useful to them.

- (5) To begin with, if possible, books be provided free of cost, and liberal prizes and scholarships, be awarded and no fees be levied.
- (6) Number of days for which the schools will close may be fixed and district boards given liberty to allow such holidays and for as many days as they consider are needed for observance in their respective districts.
- (7) The above schools may be opened on some fixed principles, and not haphazardly on the recommendation of any influential member whether they are needed or not, to avoid wastage of money. Sufficient population of the place where a school is to be opened, to ensure the required number of boys, should receive the chief consideration.
- (8) At present Hindu boys admitted in maktabas and Islamia schools are at a disadvantage. It should, I think, be ruled that in such schools only Muhammadan boys be required to attend as mixed attendance in such schools will lead to bad feeling and prove a source of trouble when Shudhhi and Tabligh movements are preached everywhere. Teachers in such schools are all Muhammadans, text-books in maktabas are sectarian and Ramzan and other Muhammadan holidays are observed. Similarly Hindu pathshalas with their special religious education should have only Hindu boys reading in them.

It appears from the report of the Islamia Committee that they are not in favour of having preparatory schools and rightly recommend all schools to be made primary schools, and similar should be the case with pathshalas. Such procedure will be in keeping with the suggestions made in Mr. Kichlu's report.

SUKH DEO TIWARI.

APPENDIX G.

Note by the President and M. SAID-UD-DIN KHAN on the present condition of maktab and Islamia school's in the United Provinces.

The inferiority of tuition in aided maktab in the United Provinces is largely due to the influence of vested interests in these institutions. Many of them afford a scanty livelihood to unqualified maulvis, who collect around themselves a few of their neighbours' children and then succeed in obtaining a grant-in-aid from the local board to save themselves from starvation. Others owe their origin to the desire of one or two influential gentlemen to secure private tuition for their children through the preparatory stage of their education, and to this end lend a verandah, a chair and their patronage. Some poor dependent who has just achieved literacy offers his services as teacher until such time as the rich man's son has acquired the elements of reading and writing at the expense of the public and then interest ceases and the maktab disappears. In the meantime the teacher has to subsist upon the grant-in-aid eked out by presents of food and clothes. He has neither ability nor incentive to increase his attainments as a pedagogue, and his policy is to give the best of his attention to the children of his patrons. The proof of the importance of the vested interest in the foundation of aided maktab is to be found in the existence of several of these teaching ventures in small areas within a stone's throw of each other.

There do exist flourishing maktab with a large attendance in places where generous Muhammadan gentlemen have endowed primary education with funds and buildings, but such institutions are few and far between, and even in them the standard of tuition is low because of the difficulties placed in the way of appointing trained men and the lack of opportunity for promotion to such men.

Nor has the foundation of Islamia training classes benefited the teaching in the aided maktab. Owing to the difficulty of obtaining Muhammadan pupil teachers the qualifying standard for admission was lowered to the passing of the primary examination and it has been found almost impossible to do much in a year with men of such poor calibre. The slight improvement achieved does not meet with the reward of appointment to posts in maktab, as the influence of original incumbents is in opposition to their own replacement by better trained men. In one district the patrons of the maktab refused to give shelter to schools staffed by trained men, and finally the authorities were obliged either to give in or to pay rent for buildings on the borders of the villages.

Even in the Islamia schools, where the qualifications for teachers are the same as in the boards' ordinary schools, the standard of tuition is lower. Service in Islamia schools is not sought after by the best type of Muhammadan schoolmaster, because they are supposed to offer less chances of ordinary promotion. This unpopularity of service in special institutions is not characteristic of such service in the United Provinces only. In western countries service in schools for particular classes of the community was found so detrimental to promotion that larger salaries had to be offered to attract capable teachers. Such schools are in those countries limited to the rich and to those suffering from infirmities. The former are subsidized by heavy payment by parents, the latter from public funds. The Islamia school ranks with the former as a privilege and does not recommend itself to the boards for additional subsidization.

from their exiguous resources. The constant influx of the least efficient teachers in the districts and municipalities into the Islamia schools actually results in the acceptance of a lower standard of attainment in these schools by the special examining and inspecting staffs.

So long as pupils remain in the maktab and Islamia schools they are judged by low standards, but as soon as they are removed from their sheltered environment into the inclement atmosphere of open competition they fail to hold their own. They are found in the lower classes of middle vernacular and anglo-vernacular schools standing physically a head and shoulders above their class-fellows, but mentally dwarfed by the sterility of their earlier teaching. An appalling remedy for the backwardness of the products of the maktab and the Islamia school has been suggested in the extension of a sheltered system of segregation right through education up to the university.

A separate inspectorate has seriously increased the disadvantages under which aided maktab and Islamia schools suffer; the Deputy Inspectors of Muhammadan Schools cannot, and confessedly do not, keep in touch with the scattered schools under their supervision. Continuous association with low standards eventually lowers their own standard of criticism, and their reports bear witness that they do not expect the boys in their schools to be up to the ordinary level. The anomalous relation of the Deputy Inspector of Muhammadan Schools with other divisional officers prevents close association with them in schemes for the advancement of teaching, and his association with the Inspector of Muhammadan Schools is so rare as to be negligible.

The district and municipal boards cannot be expected to take particular interest in schools that are to a certain extent outside of their control or to spend more than the minimum expected from them on less efficient institutions. The Muslim public, as represented by the Muhammadan education committees, becomes apathetic because it does not control the finances or the staff of the Islamia schools.

To the two members of the committee who write this note it seems that no greater disservice could have been done to Muhammadan education in these provinces than has been done by the institution of separate primary schools for Muslim boys. In their opinion it has lowered standards, weakened discipline, created apathy, and above all dissociated Muhammadans from the ordinary national system of education. Instead of fixing their attention on the preservation of rights in the more efficient institutions, they have concentrated on the establishment of communal schools with all the defects inherent in a sheltered system.

The following suggestion is put forward for the distribution of teachers in primary schools:—

A community in the minority locally should be allowed.

One teacher for 20 children in regular attendance in a single-teacher school.

One teacher for 20 children in attendance in a two-teacher school.

One teacher for every 30 children in regular attendance in large schools.

H. B. WETHERILL,
SAID-UD-DIN KHAN.

APPENDIX H.

Scheme of the co-ordination of the ordinary primary education with practical training in agriculture and common industries by
SAIYID ALAY ALI NAQAVI.

Seeing that the S. P. G. Mission are successfully maintaining an agricultural school at Umedpur (Moradabad district), in which both the primary education and agricultural training have been co-ordinated on a sound basis; also that some of the children receiving primary education in the elementary school managed by the Salvation Army at Fazalpur (Moradabad) receive, side by side, a practical training in industrial work without the least harm to their health or their studies, and at the same time earn wages for their labour, the attention of the well-wishers of the country is naturally drawn towards these useful institutions, and I am thoroughly convinced that it would be in the best interests of the country if the excellent lead given by the aforesaid Missions was duly appreciated and followed by the public and the department, and earnest efforts made to introduce similar systems in our primary schools, gradually, with a due regard to the funds at our disposal.

After having carefully inspected both these schools and making all necessary inquiries, I have arrived at the conclusion that the methods employed there can, and should, with advantage, be adopted—of course with necessary adaptations—by the district boards, although the establishment of an institution like that of Umedpur would, evidently and necessarily, involve a heavy initial outlay and a substantial recurring expenditure.

Before describing the main features of the named schools I consider it my duty to point out here at the outset that the secret of their success lies not merely in liberal expenditure, which is being incurred by these philanthropic Missions for the uplift of the depressed classes, but also and mainly in the spirit of self-sacrifice and selfless service evinced by the leading missionary workers and unstinted sympathy shown by them to the poor classes; a thorough supervision exercised by the controlling authorities, due consideration of the minutest details, and the unfailing clock-like regularity and punctuality with which each of the prescribed functions is promptly discharged by every member of the establishments concerned. Now coming to the point.

The Agricultural School, Umedpur.

The Agricultural School at Umedpur is a boarding institution, and has, besides the school and hostel buildings, an agricultural farm, a chapel and a dispensary, farm buildings, teachers' quarters and a *pucca* well. It is divided into a nursery and a senior primary school with separate arrangements for the hostel accommodation, cooking of food as well as the tuition of the infants and the elder boys.

The students of this institution belong to the Chamar community, since converted into Christians. Out of the present enrolment of 31 boys in the senior school and 27 in the nursery school—total 58—only 15 are orphans; all the rest having their parents and families in the neighbouring or outlying villages in the district that have sent them here voluntarily. The guardians of the latter usually come to the schools to pay visits to their children once every month, and while at

Umedpur they are treated with attention and hospitality by the school authorities. The children themselves are allowed to go to their homes during the Christmas holidays and summer vacations ; only a few of them as are needed for the work connected with the farm or the garden or to look after the cattle being by turns detained.

The staff consists of a missionary lady, Miss Cruddas, who is an honorary worker and is in charge of the nursery school, Revd. Underwood, who regularly comes every week from Moradabad to train the children in boy scouting, Mr. H. C. Dutta, a graduate of Ohio University in agriculture, who is in charge of the senior school and the agricultural farm and the garden, two female and six male assistants, one manual instructor, and only one farm servant and a chaukidar. The farm dispensary is in charge of a missionary lady, who does other mission work as well in the interior. The whole establishment is in the charge of Revd. Canon Crosthwaite, whose attachment to the institution and excellent management and supervision are self-evident and well known.

The buildings are all *pucca*. The total initial expenditure, already incurred so far, on the farm and building, the cattle and the agricultural implements comes up to about Rs. 36,000, and the recurring expenditure on the pay of the staff is Rs. 438 per month or Rs. 5,256 per annum.

The session begins in July and the annual examinations are held before the commencement of the harvest work in March, though formally the school session lasts till May.

The tuitional work is done for two hours in the nursery school and for three hours in the senior school in the day time, and the boys

General time-table.
5.30 a.m.—Rising bell.
6 to 6.30—Morning assembly (and morning breakfast).
8 to 11.30—Farm and garden work.
11.30 to 12 a.m.—Morning meals.
12 a.m. to 1 p.m.—Rest.
1 to 4 p.m.—School.
4 to 4.30 p.m.—Rest.
4.30 to 6 p.m.—Farm and garden work.
6.30 p.m.—Evening meals.
7 to 7.25 p.m.—Evening devotion.
7.25 to 9 p.m.—Study work.
9.30 p.m.—Sleeping bell.
N.B.—1. On Saturdays scouting is done from 8 to 5 p.m. and the children wash their clothes from 10 to 12 a.m., and on Sundays they clean and oil the machines, look after the cattle and take rest.
2. From 8 to 11.30 a.m. a batch of four boys, which is changed every week, learns carpentry with the mistri.

are collected again in the evening to privately study under the supervision of teachers what they have learnt in the day for one and half hour, while three and half hours are devoted by them in the forenoon and one and half hour in the afternoon to agricultural work. Thus the total period which the senior boys daily devote to their studies is four and half hours (including the night school time), while five hours are given to agricultural and horticultural or other work. The younger children do a less amount of work, and while at the farm only assist the bigger boys. Along with this it may be mentioned with due emphasis that the daily routine of duties assigned to boys, which would be evident from the general time-table given on the margin,

is strictly adhered to, and the boys themselves in batches of four, which are changed every week, do the kitchen work, and every Saturday each boy washes his clothes, and all of them learn boy scouting.

Besides the work at the farm and in the garden, the boys themselves have to do, turn by turn, the *chansa* work at the well (i. e., irrigation of the school garden), the looking after of the farm cattle, the work of the *kolhu* at the time of sugarcane-pressing, and also learn from the *mistri* the carpentry work needed for making or repairing agricultural apparatus and miscellaneous useful articles.

The function of the farm servant is only to carry on in the absence of the children while they are in school, the farm work needing continuous attention.

The head master keeps an account of the income and expenditure of each boy.

The monthly earnings of each boy are determined by the total number of hours he has worked at the farm in a month at the rate of one anna per hour of work, and the expenses are the food and clothing charges, a grant of Rs. 1-8 per month for tools and implements required by boys for personal use, and an anna per rupee earned given to him as pocket money. The savings, if any, are credited in the name of each boy in the post office savings bank.

The average total monthly expenditure per boy over the food, clothing and implement charges comes to Rs. 8 in all (food charges being only Rs. 6 per mensem), but the earnings of different boys, which depend on their respective efficiency and amount of work, naturally differ, and consequently such of the children as do not at present earn enough wages to cover their necessary expenses, though supported out of Mission funds, are shown as debtors and the amount of the liabilities recorded, with the idea that they will have to clear them in future. It would be interesting to note here that by the end of June, 1925, eight students of classes III, IV and V had in their accounts savings ranging from Rs. 15-9-9 to Rs. 56-11-6, while the majority of the senior school boys were earning sufficient money to meet their personal expenses, and only a few of them were in debt.

The gross income from the produce of the various crops of the farm and the garden attached to the school was, in the year ending June, 1925, Rs. 3,665, while the expenditure, so far as could be ascertained and which was exclusively spent on rent and revenue paid for the farm lands, the purchase of seed and contingencies amounted to Rs. 1,054. The grain and vegetables, whose price has been included in the former sum, was mostly consumed by the boys and teachers at Umedpur themselves.

The curriculum taught here, though not yet standardized, is on the lines adopted in ordinary primary schools, with the only difference that the Punjab series of rural readers are taught here as the literary course.

The classes A, B and I are taught in the nursery schools, and classes II, III, IV and V the last class no being the same as in our middle schools, so far as the course taught is concerned) in the senior school.

The agricultural training comprises farm work, garden work, looking after cattle, work at the well for the irrigation of the vegetable garden, and manual training.

On looking into the details and classification of the various processes of agriculture taught to these boys, as explained to me by the able head master at the time of my visit, as also on seeing the results of the

labours of boys in, the form of improved and profitable crops of grain and vegetables raised by them last year, it was proved to me that an average rural child, who is, as a rule, more or less familiar with horticultural and agricultural work, can pick up a fair knowledge and practical skill in those two branches, and along with that in carpentry work necessary for an agriculturist in five years' time.

The main point which deserves particular mention in this connexion is that, generally speaking, there is no hard and fast line of demarcation between different agricultural processes as in the case of the tuitional work, as a result of which the young children as well as the senior boys, while busy in agricultural activities, receive equal and simultaneous training in all or nearly all the various processes into which the farm work is divided. For instance, a boy working in the garden will be acquiring a knowledge of and practice in soil preparation, bed-making, drainage and seed-planting simultaneously, and the degrees of efficiency of different children will vary only according to the individual diligence, energy and aptitude and the amount of work done.

The only points that remain to be noted here are that I found the children at Umedpur quite healthy and well-behaved and imbued with a spirit of self-help and self-reliance, and that their tuitional progress was also quite satisfactory on the whole, the standard of their ability in the language subject and Urdu pronunciation being above the average, presumably because they are taught the Bible also, and literary readers used in the Punjab are taught here.

The Primary Salvation Army School at Fazalpur.

This institution is a day school and quite different in several respects from that at Umedpur, though equally well serving a highly useful purpose.

The school is attached to the Salvation Army Settlement at Fazalpur, which is under the management of Adjutant E. H. Sheard.

The colony is mostly populated by Bhantus and Haburas and some Sansias and Doms, and has got a big weaving factory in which cloth, carpets, towels, and *niwars* are manufactured, and the women of these communities do the sewing work.

The students of the school (93 boys and 76 girls) belong to the above-named castes only, 80 out of 169 being Bhantus, 81 Haburas, 1 Sansia, and 7 Doms. Out of the total number 125 children are such as live with their parents in the colony, while 44 (including 17 girls) daily come to the school from the city (Moradabad), which is about two miles distant, and where their fathers are employed as domestic servants and are under the general supervision of the manager of the Settlement.

The course taught in this school is the same as in use in ordinary primary schools. It is regularly inspected by the district inspecting staff, and, till recently, used to get an aid of Rs. 25 per mensem from the district board.

It might be stated here that religious instruction also forms part of the teaching imparted in the school, and the children are well versed in the general religious information given in the catechisms used and recitation of prayer songs, which, when sung by them in chorus, are very impressive.

The school staff consists of three female and three male teachers, each of whom is paid at a uniform rate of Rs. 12 per mensem. It might be mentioned here, by the way, that the husbands of these ladies (one of whom is the wife of the head master of the school) are also getting Rs. 25 per mensem each for the work in the office or at the factory.

The school house is a spacious rectangular shaped building with a *pucca* flooring, a tiled roof, a side apartment in one corner, and a wide courtyard in the centre and one gate for egress. It was constructed at a cost of Rs. 2,000, and is quite airy and well lighted. Three dormitories are used for school purposes, while in the fourth some of the weaving machines (in excess of those in the main factory building) are placed and worked at.

The working time of the factory is from 8 to 12 noon, and again from 1 to 5 p.m., while the school is held from 10 a.m. to 2 p.m.

Now the characteristic features of this school are that some of the scholars reading in it, whose parents are poor, voluntarily work at the factory also. The number working at the factory consists of none of those that come from the city to attend the school and none from the preparatory classes A and B. Further, some of the school children working at the factory attend the school for half the time only, and others for the whole of it.

The half-timers attend the school from 12 noon to 2 p.m. and work at the factory for the rest of the time, while those attending the school for the full time work at the factory from 8 to 10 a.m. and again from 2 to 5 p.m. Though not fixed on a regular basis it is a fact that the children do not work continuously from 8 a.m. to 5 p.m. and get short intervals of recess, in the course of the work, to take their meals or a little rest. They have to work at the factory for four days only in a week.

The total number of children who attend the school for the full time and also work at the factory is 20 (including four girls), and that of the half-timers nine (including two girls). Of the latter nine students four work in the factory at the spinning wheel and make windings, and five do the weaving work at the handlooms. The weekly earnings of the children doing the winding work range from 12 annas to Re. 1-4 per head, and of those engaged in spinning cloth from Rs. 1-4 to Rs. 2 per head.

Of the boys attending the school for the full time three children do the winding work, one does hosiery work, and 15 weave *niwar*. The weekly earnings of those doing the winding work range from Re. 1 to Re. 1-4, and of those engaged in *niwar* weaving from 10 annas to Re. 1-4.

The time taken in acquiring fair efficiency and a working capacity in the different kinds of work referred to above would be shown from the following statement :—

| <i>Niwar</i> weaving | Hosiery (sock-making). | Winding. | Ordinary weaving. | Advanced skill in weaving. |
|----------------------|------------------------|-----------|-------------------|----------------------------|
| 1 week .. | 2 months .. | 1 week .. | 6 months .. | 2 years. |

Before concluding the account of this school it must be mentioned that the boys and girls reading here were quite healthy and energetic-looking, which proves the fact that the work of teaching, though combined with additional labour at the factory, does not impair their health. On the other hand, the co-ordination of the school education with the practical work in the factory is extremely useful in securing them some skill in particular vocational work, and at the same time enabling them to earn something every day, which is a source of satisfaction and material help to their parents, and consequently of winning their sympathy and attracting them towards education, which, in itself, is a valuable thing.

The only point which needs the attention of the manager, as I suggested to him at the time of my visit, is that the tuitional arrangement of the half-timers is not completely satisfactory, as in the school, during the two hours that they attend it, they are educated with such other children in their respective classes that attend it for the full time, and so the former cannot conveniently keep pace with the latter after having missed two hours' teaching every day.

Scheme of co-ordination of ordinary primary education with the agricultural and industrial training in the district board schools.

As the general lines and methods of work adopted in the schools at Umedpur and Fazalpur, on whose models schools are proposed to be opened by the boards, have been outlined above in fair detail, it appears advisable that only such of the important points may be mentioned here as have not been stated in connexion with either of the two institutions, or as will have to be specially borne in mind when adapting the scheme for its introduction in ordinary schools whose general atmosphere and environment are evidently different from the institutions controlled and managed by the Missions.

Agricultural primary schools.

1. The place selected for a school of this type should have a complete rural environment and should preferably not be far from a town having an agricultural middle school and a dispensary.
2. These institutions must, as a rule, be boarding schools, and separate hostel arrangements be made in them for the senior and junior pupils and separate kitchens for Hindu and Muhammadan boys provided.
3. The buildings should, as a rule, be all *pucca* houses, well ventilated and well lighted, a rough estimate of whose cost is given below :—

| | Rs. |
|---|-------|
| (1) Class rooms according to the plan given on the margin and as adopted at Umedpur | 5,000 |
| (2) Hostel dormitory for seniors | 4,000 |
| (3) Ditto for juniors | 2,000 |
| (4) Kitchen for Hindu students | 1,000 |
| (5) Do. for Muhammadan students | 1,000 |
| (6) Head master's house | 2,500 |
| (7) Quarters for the staff (10 houses) | 6,000 |
| (8) Two rooms to serve as godowns | 500 |
| (9) Two latrines | 3,500 |
| (10) Cattle-shed | 150 |

| | | | | | |
|---------------------------------------|----|----|----|-----|--------|
| (11) Other farm buildings | .. | .. | .. | Rs. | 500 |
| (12) Pucca water course in the garden | .. | .. | .. | .. | 100 |
| (13) Threshing-floor | .. | .. | .. | .. | 150 |
| (14) Mill houses | .. | .. | .. | .. | 650 |
| (15) Granary | .. | .. | .. | .. | 1,100 |
| (16) Land, 40 acres | .. | .. | .. | .. | 8,000 |
| (17) Pucca well | .. | .. | .. | .. | 500 |
| Total | | | | .. | 39,000 |

4. The cost of the agricultural apparatus and other tools and implements as well as equipment of school will be as follows:—

| | | | | | |
|---|----|----|----|-----|-------|
| 1. Agricultural apparatus | .. | .. | .. | Rs. | 1,000 |
| 2. Initial school equipment | .. | .. | .. | .. | 500 |
| 3. Manual training tools and implements | .. | .. | .. | .. | 200 |
| 4. Other miscellaneous | .. | .. | .. | .. | 300 |
| Total | | | | .. | 2,000 |

5. The staff should be properly strengthened by the appointment of a graduate in agriculture who is also experienced in the management of farm work as head master on a decent pay, and the assistants should, as a rule, be V. T. C. men who are trained in agriculture also. The number of teachers, including the head master, should at least be six, so that each man may have to teach not more than one class; one of the assistants may be entrusted with the supervision of the agricultural work in particular, though all would more or less take part in agricultural work besides the tutorial; and the head master may be required to devote most of his time to supervising the school as well as the farm; to keep the accounts, and do some little teaching of the purely agricultural part of the studies. The teachers should preferably be trained in boy-scouting. Some of the teachers on the staff should be Muhammadans, one of whom may be in charge of the Muhammadan kitchen. A qualified doctor of the neighboring town may be given a decent allowance to visit the school every week and to treat the children when needed.

6. The estimated recurring expenditure on the salaries of the staff will be as given below:—

| | | | | |
|---|----|----|-----|----------|
| 1 Head master (graduate in agriculture), Rs. 120-5-150 | .. | .. | Rs. | 150 |
| 6 V. T. C. assistants (trained in agriculture), Rs. 30-2-50 | .. | .. | .. | 300 |
| Medical allowance to a doctor at Rs. 25 | .. | .. | .. | 25 |
| 1 Carpenter at Rs. 25 | .. | .. | .. | 25 |
| 1 Farm servant at Rs. 12 | .. | .. | .. | 12 |
| 1 Chaukidar at Rs. 10 | .. | .. | .. | 10 |
| 1 Sweeper at Rs. 8 | .. | .. | .. | 8 |
| 2 Hindu cooks at Rs. 10 | .. | .. | .. | 20 |
| Pay | | | | 550 × 12 |
| | | | | 6,600 |
| Provident Fund | .. | .. | .. | 170 |
| Books and apparatus (annual allotment) | .. | .. | .. | 90 |
| Repairs of buildings | .. | .. | .. | 1,200 |
| Total | | | | 8,000 |

It might, in this connexion, be mentioned that if in order to encourage and help the poor and deserving children of agriculturists and depressed classes some assistance is given in the beginning, say for two or three years, in the form of a monetary grant or stipend at the rate of Rs. 4 per month per boy to cover half of his monthly expenses until such time as their labour at the farm becomes productive. About Rs. 2,000 more shall have annually to be reserved in the budget for this purpose, and the total annual expenditure will ultimately, i.e., when all the teachers begin to get their maximum salaries, amount to Rs. 10,000.

The cost of supply of seed and other necessary contingent charges of the farm will evidently, except in the first year or the first two years, be forthcoming from the cost of produce of the fields and the garden, and as the work develops the amount of receipts under this head will certainly exceed the expenditure incurred.

Though apparently the institution will involve a high initial as well as annual recurring expenditure, yet, considering its evident usefulness and educative value in awaking and attracting the agriculturists towards education, and, in the maturity of time, to make them realize the utility of the use of advanced agricultural implements and improved methods, the money will be well spent, and the country should not grudge it.

Admission of students and hostel arrangements.

7. I personally think that it would be preferable to admit in this school the children of only such persons as are engaged in the profession of agriculture, and agree to allow the children to live in the boarding-house, and for at least a year or two are willing to meet the expenses of their sons, or, if they are not well to do, to pay at least Rs. 4 per mensem for each boy. The selection of pupils to be admitted in the school should, as far as possible, be from each tahsil, and every agricultural community in the district, so as to widen the sphere of influence and reputation of the school.

Another condition for admission should be that the boy must have passed the infant stage. The children themselves may be required to do all the work connected with the farm, the garden, looking after cattle irrigation of the garden from start to finish, as they do at Umedpur, and the accounts of their income and expenditure regulated in the same way as at Umedpur.

The Hindu, Muhammadan and Christian (if any) boys may be accommodated in the hostel together, but the mess arrangements of each community should be made separately. At least one of the hostel superintendents should be a Muhammadan, whose duty would be to supervise the kitchen arrangements of the Muhammadan boys, as well as to see that they pay due attention to their religious observances; in the same way the Hindu superintendent will look to the needs of the Hindu students in those respects.

The only distinction for the Hindu boys would be that a Brahman cook will, as a matter of necessity, have to be employed to prepare their food, for the evident reason that in their case the caste question comes in. The Muhammadan or Christian boys will, on the other hand, prepare their own food as the boys do at Umedpur, because this practice seems to me very desirable and useful from every point of view.

The number of boys for whose education arrangements will be made in the beginning will be 60, but when the reputation of the school is established and the experiment proves a success the enrolment is sure to rise, and the increasing demand for such education will have to be satisfied by either extending the hostels or by opening new schools in different places.

8. *Course of studies.*

So far as the teaching of arithmetic, geography, drawing, and object lessons is concerned the curriculum might be the same as prescribed for primary schools at present, but the literary course shall have to be changed so far as the readers are concerned. It would, perhaps, not be a bad idea to prepare fresh readers for such agricultural primary schools in which the greater part of the subject-matter may consist of rural topics and some rudimentary knowledge of the science of agriculture which may lead the children, on finishing the primary stage, to the agricultural course of the middle schools. Also, in consultation with the Agricultural department, some suitable syllabus be given of practical agricultural work also, though, as I have noted elsewhere, the general scope and nature of the work to be done by the beginners as well as the higher classes will be nearly the same.

Manual training will also form part of the curriculum as at Umedpur, but the work will be alternative with farm work and done by different batches, changed every week and the aim will, in this stage, be only to enable the boys to make necessary tools or carts, etc., which are commonly required for agricultural purposes.

The last point that I would insist upon in this connexion is that the fullest advantages of the residential system recommended above, will accrue only if sufficient attention is paid as actually done in the Mission institution, held as a model, to religious teaching and boy scouting on sound lines.

9. *Time-table.*

The only suggestion I have to offer under this head is that its general outlines should be the same as at Umedpur. The particular point to be borne in mind for a school, the majority of whose students will be Hindus and Muhammadans, is that the boys should get enough recess for their prayers.

10. *Inspection.*

As in order to ensure the efficient working of every institution of public utility its regular inspection by experts is essential, the proposed school will be under the inspection of responsible department of both the educational and agricultural officers and directly managed by the Deputy Inspector.

11. *General suggestions.*

In order to draw the attention of the rural public to this useful institution, and to spread its reputation as well as to broaden the outlook of the students reading in it and to secure them all the advantages of camping, it would be highly advisable if occasionally the boys go, under the supervision of teachers, far and near on hikes, demonstration trips, and service trips in the district.

Industrial primary schools.

These institutions, though greatly different from a model agricultural—primary school, whose scheme has just been sketched in more than one respect, will serve a distinct and highly useful purpose.

The proposed schools of this type will be only day schools, involving much less expenditure than a model agricultural—primary school, and, in case the general principles adopted at Fazalpur are accepted, it would be conveniently possible to arrange the training of students in different arts and crafts, in primary schools of particular places, to suit the local industries at more than one centre in a district. The amount of expenditure incurred, though more than the cost of an average big primary school, will not be forbidding.

The main objects of these schools will be threefold :—

- (1) To provide vocational training in primary schools and thus remove the familiar, though well-based, objection that the children taught in primary schools are alienated from their hereditary professions.
- (2) To provide to the children of poor classes after a short preliminary instruction and practice in the craft introduced an easy means of earning daily wages which will lessen the apathy of the needy and ignorant parents towards education, and attract the children to schools.
- (3) The boys who are compelled by circumstances to give up their education on passing the primary stage and lead a discontented and aimless life in search of employment, which is nowhere available, will be enabled to earn their livelihood and thus be a great help in disproving the wrong notion of the unthinking masses that primary education is a curse rather than a blessing to them.

The various points needing attention in this connexion are briefly dealt with below :—

1.—*Location.*

To start with, only those places may be selected for this experiment where the people are not generally adverse to professional work or which have already got some thriving industry, for instance, the following places in Moradabad district which are famous for the industries noted against each :—

- | | | |
|----------------|-----|---------------------------------------|
| 1. Moradabad | ... | Brassware-making. |
| 2. Kanth | ... | Carpentry and cobbling. |
| 3. Sambhal | ... | Comb-making. |
| 4. Bhojpur | ... | Weaving of cloth. |
| 5. Thakurdwara | ... | Cotton print (<i>chhipi's</i> work). |
| 6. Amroha | ... | Weaving of <i>niwar</i> , etc. |

2.—*Status and type and the working of the school.*

The school in which an industrial training is also to be introduced should, preferably, be an ordinary primary school, but in case the experiment proves a success the privilege may be extended even to

preparatory schools if the people may be desirous of it. The only necessary conditions to be observed in such schools should be—

- (a) That the school may be held for four hours in the forenoon, and again for four hours in the afternoon with suitable short intervals, after each period, for drill or rest, and a recess of one or two hours in the noon, for taking meals and the timetable should be so arranged, that the children may not have to do either the school studies or the manual work for more than three hours; of the two alternatives (1) that the tuitional and the manual work may each be done exclusively in one of the half-times, and (2) that, either work be done both in the forenoon and afternoon side by side : I prefer the latter course.
- (b) To insure that the tuitional work of classes, other than the preparatory section, to which four or five hours are given at present, may not suffer, each class may be given a separate teacher regardless of the number of students in it.

Besides them, one or two local manual instructors (either of only one or of two professions) may be engaged as whole-time employés of the board.

3. *Building.*—In case there exists already a district board school house at the place selected for school of this kind it may be extended according to the needs. But, if in that locality a new building is to be erected, it should be of the Fazalpur plan, which will cost only about Rs. 2,000 and will be quite commodious and spacious enough for our purposes.

4. The school will be open to boys of all castes and creeds; and the admission into the manual work class will be voluntary. The salaries of the teachers will be according to the approved scale in force, while the pay of the manual instructor will vary in different places and for different men, but it will not exceed Rs. 25 or 30 per mensem.

5. The course of school studies will be the same as may be in force in ordinary primary schools for the time being, but that of the professional work introduced in it will be easily determined, in consultation with the local artisans, or experts of the Industries department.

6.—*Arts and crafts to be introduced.*

If once the principle of co-ordinating the ordinary primary education and manual training is accepted, there would be no limitation as to the selection of useful occupations, that might, with advantage, be introduced in different schools. A list of some such works, which is by no means comprehensive, is given here, as can be profitably introduced in primary schools: (a) *niwar*-weaving; (b) cloth-weaving; (c) *durri*-making; (d) dyeing of cloths and *chhipi*'s work; (e) cobbling; (f) tailoring; (g) carpentry; (h) brassware-making; (i) comb-making, and so on.

The general determining factors in the selection of particular crafts should be, that after a short apprenticeship, the boys may become able to pick up a working capacity in the work, as at Fazalpur, and the work done or the articles constructed by the teacher and the boys and sold at the market price, may bring in sufficient income to be distributed to the worker students, as monthly, weekly or daily wages.

As is evident, it would not only create in the children a taste for independent earning, but also impress their minds with the dignity of labour, and be a source of material help to themselves and their parents.

7.—*Ways and means of supply of requisite raw material and the disposal of the manufactured goods.*

The main points deserving a mention are that necessary tools and apparatus, required in the case of majority of the crafts, will not cost much and the necessary tools, as well as the raw material, shall have to be supplied by the board out of its own funds.

In the beginning, so long as the pupils are beginners, there will be no profit, then for some time the finished articles will be those prepared by the teacher himself, with the help of the students, and the third stage will be that in which both the teacher and the boys will be preparing a sufficient number of articles which will fetch a substantial price.

Finally, the board will be relieved of making any grant for the purchase of raw material. Having the example of Fazalpur before me, and after consulting some persons acquainted with some of the important occupations recommended above, I have not the least hesitation in stating that it would not take long to reach the final stage.

As a matter of principle, the children will be eligible to get wages, only when they have become skilled enough in an occupation, and have begun to prepare finished articles, and the amount of wages will depend on the period taken by them in making a thing, or doing a work, and the profit accruing after deducting the actual cost, from the sale price, as is done in the Salvation Army Factory.

The one concession that the board shall have to make for the encouragement of the boys will be that the wages due to them, will be paid at regular intervals without waiting the sale of the articles manufactured by them in the school.

In conclusion, I respectfully urge, once again, the extreme necessity and advisability of establishing schools of the type of Umedpur and Fazalpur, as an experimental measure, for the benefit of the agricultural and backward communities and the poor classes of the Indian community.

DATED MORADABAD:
March 8, 1926.

ALAY ALI NAQVI, M.A.,
Deputy Inspector of Schools,
Moradabad district.

APPENDIX I.

*Note of dissent prepared by MASUD-UL HASAN, ESQ., Khan Bahadur,
member of of the Committee.*

To take as a basis of calculation the percentage of boys of all communities at school to the total male population and treat it as giving a general level as regards primary education is incomplete, defective, and misleading.

Paragraph 6. It is safe to take the standard of literacy as given in the Census Report as the true indication of a community's educational progress.

Paragraph 15, Note of Dissent. It is to be noted that so many as 33 per cent. of the Moslem boys, receiving primary education, are enrolled in Islamia schools and maktabas. It is recognized by the Committee that teaching in them is comparatively inferior, and also that the boards are unwilling to spend money from their own funds on them, which almost resembles calling a dog a bad name and then kill it. What is really and justly needed is to attach the fullest importance to schools attracting one-third of the total Moslem scholars and to adopt effective measures for the improvement of these institutions, which are very popular among the Muhammadan community and helpful in improving its literacy.

In this connexion it will not be out of place to mention that so early as 1882 the Educational Commission, after fully weighing the facts and educational conditions of the Moslems, made their recommendations with regard to the Moslem education. In my opinion the Commission had rightly diagnosed the disease and prescribed efficacious remedies. Later on Mr Karamat Husain's Committee endorsed the views of the Educational Commission and made useful suggestions, more or less on the same lines. The evidence recorded by this Commission corroborates, in substance, the conclusions arrived at by the representative bodies referred to above. The necessity for Islamia schools and maktabas to cater for the special educational needs of the Moslem community was fully recognized by the Local Government. Sir James (now Lord) Meston in the Government Resolution no. IV of 1914 was pleased to observe: "It is useless to ignore the fact that in existing conditions the ordinary board schools do not and cannot adequately cater for certain sections of the communities, and for the education of these sections special measures must therefore be taken."

No doubt some improvement in the education of the Muhammadans has been made of late, but the lack of sympathy shown to the Moslem education by the boards is evident from the fact that only 762 Islamic schools exist for the education of the boys belonging to the Muslim community, numbering nearly 70 lakhs. Further, it has to be pointed out that it was due to the lack of sympathy shown by the local boards that no appreciable improvement in the educational conditions of these schools could be made.

It is a matter of great regret that applications for grants-in-aid to maktabas are never considered with deserving sympathy, and are generally rejected. This being the state of affairs, how could any improvement in these special institutions be expected?

None of the boards or the Education department ever made, or even thought of making, any serious effort to remove the defects existing in these institutions, and to raise the standard of their efficiency while retaining them as such.

While we recognize as an ideal a single type of school for boys of all classes and communities we cannot shut our eyes to the realities of Indian life, full of communal prejudices and abounding in castes and creeds. It is very well for an idealist to have lofty and noble ideals to perceive, but it is so very difficult to put them into practice all of a sudden, and to ignore the actual difficulties that lie in working these ideal institutions. In this country we feel that a single type of school cannot fairly cater for the special needs and requirements of the Muslim community, and attract boys in sufficient number, for a long time to come. We feel that special Islamia schools should not be abolished for the following reasons :—

- (1) Sufficient experience of the advantages of the facilities and efficacy of safeguards to be provided in a single school system has still to be ensured.
- (2) These institutions have given a distinct stimulus and have popularized education and led to an increase in the number of Moslem scholars.
- (3) There is a guarantee for cultivating Islamic habits and religious practices among the boys by their association with Moslem teachers.
- (4) The presence of Moslem teachers in the schools creates a confidence in Moslem parents.
- (5) There is a certainty of teaching real Urdu. What is needed to improve the utility and efficiency of these institutions is that they should be staffed with qualified and trained teachers, and the same facilities—rebuilding, equipment, and grants—be extended to them as are provided in the ordinary mixed schools. The special curriculum approved for the maktabas should be introduced in Islamia schools in place of the mixed school curriculum.

The personality of a teacher is one of the most important factors upon which depends not only the success or failure of a school, but even in a greater degree the attraction of children of a particular community. Hence it has been a long-standing grievance of the Muhammadan community, since the time of the Education Commission of 1882, that one of the chief causes of their backwardness in education has been the paucity of Muhammadan teachers in public schools. This point is the most important one from the Muslim point of view, and must be dealt with prominently in order that no loophole be left for the recalcitrant boards to avoid or ignore it.

In my opinion the guarantee to ensure a sufficient number of Muslim teachers should be embodied in the Education Code, and should not be left as a pious wish to the local boards.

The safest and most unobjectionable principle, which has already been adopted by the Government in determining the number of members of district and municipal boards, should also be applied to teachers

employed in mixed schools. In my opinion the distribution of Muhammadan teachers in various schools in a district should better be left to the discretion of educational officers of the district, who should be guided by the opinions of Muhammadan educational committees. But the district officers should be enjoined to follow the principles suggested by the chairmen of such committees. I agree with the main principle underlying the suggestion of the chairman, but I consider it advisable, in the interest of my community, that the following modifications be made in the proposal :—

A. The posting of a Muhammadan teacher in a single-teacher school, or in one having two or more teachers on the staff, should not be dependent upon the attendance in the school concerned, but upon the Muslim school-going population of the locality.

Further, in the case of two or more teachers' school, if 10 or 12 boys are available for admission in a school, a Muhammadan teacher must be appointed on the staff. In my opinion the proportion should be determined by the Local Government for each district and should not be left to the board concerned.

Another important safeguard for the interest of Muhammadan education which was recommended by Lord Meston's Government in the famous resolution which has never, so far, been duly attended to, is that the number of Muhammadan Deputy Inspectors of Schools in charge of the districts should be adequately strengthened. It is these officers on whom ultimately rests the working out and enforcement of the schemes for the expansion of primary education that are, from time to time, sanctioned by the Government.

In regard to the proposal of the ultimate elimination of a separate inspecting staff for the Muslim community, which is embodied in the concluding paragraph, I lodge a strong protest against the proposal, and insist that, in order to safeguard the interest of my community, it is essential that Inspectors of Muhammadan Schools for the whole province, whose status may be that of divisional and deputy divisional inspectors of schools, must be retained. With the object of strengthening the hands of these officers, and making them more useful, the scope of their work and powers should be widened. Their duties should not consist of merely inspecting special Muslim schools and the compiling of statistics, but also of keeping an eye upon the progress of Muslim education as a whole. They should look after the educational interest of the community in the districts assigned to their charge, and should be permitted to inspect mixed schools and records of the educational branches of the district board offices if needed. In the same way it is necessary to provide equal facilities to Muhammadan boarder students. To supply an adequate number of Muhammadan teachers in primary schools is highly desirable and necessary. In order to attract a greater number of Muhammadan students it is advisable to grant a certain number of scholarships to boys passing the upper primary examination, reserved particularly for Muhammadan students in the district.

With regard to paragraph 8, part A., I very much regret to point out that the conclusions arrived at by the Committee are not warranted by facts. It is an open secret that the same boards, which on account of

so called straitened circumstances "are unable to spend money on inferior denominational schools" have been liberally providing funds for the establishment of ultra-denominational and inferior institutions. A number of pathshalas without any fixed syllabus, or a qualified staff, have been founded in a number of districts. It is a pity that while the Islamia institutions are denounced not a voice is raised against these pathshalas on which public funds are being lavishly spent.

For the very reasons noted in the reports, as grounds for the retention of aided maktabas, as well as for the reasons suggested by me elsewhere, I am of opinion that not only all the existing maktabas should be retained, but also sufficient allotments should be made for the aiding of new maktabas to satisfy the existing demand. At the same time I would strongly recommend that active steps may be taken to improve them in all respects.

The words "or a responsible manager" should be added after the words "managing committee" in parts A and D because at the present stage, when about 95 per cent. of the population is illiterate, we cannot always expect the formation of an efficient managing committee even though the demand be perfectly genuine.

The recommendations contained in parts (e) and (g) should gradually be enforced in maktabas and, in case teachers with the V. F. or P. T. C. qualifications be not available, a man with lower qualifications may at present be allowed to remain on the staff.

The recommendation contained in part (i) should not interfere with the provision of teaching Persian and special Urdu readers containing religious subject, matter should be prescribed in the maktabas.

See the evidence of Mr. Allay Ali Naqvi on the subject of Islamia training classes. In my opinion his suggestions should be accepted.

It must be one of the specified duties of the Muhammadan educational committee of a district to prepare the budget for the special Muhammadan institutions, within the allotment sanctioned by the Government for the purpose, as well as to suggest measures to satisfy the genuine demand for the expansion of Muhammadan education.

MASUD-UL BASAN,
Bar-at-Law.

APPENDIX J.

The joint note of the four Muslim members of the Committee.

We sign the report subject to the following note of dissent :—

We wish to express our regret at the outset that it should have at all been necessary for us to write a separate note on Muslim education, but we are impressed with the necessity of so doing, because we feel that the question had not had that sympathetic consideration from the majority of the members which its importance demanded. The United Provinces of India have been the cradle of Muslim civilization and Muslim culture for centuries, and it does not redound to the credit of our educational system that the Muslims of these provinces should be even more backward than the average Musalmans throughout India. According to Census Report, volume I, part I, page 187, the number of literate Musalmans throughout India is 93 per thousand, whereas the number is only 73 in the United Provinces. This percentage is for boys of five years of age and over. If all ages were included the percentage comes to 65 per thousand. It would further be manifestly unjust to compare the literacy of the Muslims in these provinces with all the rest of the population including the depressed and the untouchable classes, diffusion of education among whom, however laudable in itself, is an idea of recent growth.

Without committing ourselves to the view that depressed and untouchable classes form an integral part of the Hindu community we think that for the purposes of this resolution the population of these provinces may be divided into three main heads :—

- (1) Musalmans.
- (2) Depressed and untouchable classes.
- (3) Rest of the population.

We have said that diffusion of education among the depressed and untouchable classes is an idea of recent growth. The numerical strength of these classes in the provinces is about the same as that of the Muslims* the proportion of literacy among them being necessarily very low. The percentage of literacy among the higher classes of Hindus included in class (3) above is fairly high, as the joint percentages of classes (1) and (2) is practically equivalent to the Muslim percentage of literacy as mentioned in the report. In case of steps being taken to raise the standard of education among classes mentioned in class (2) above the general percentage of the Hindu population formed by classes (2) and (3) will be automatically raised.

The proportion of literacy among the Muslims must, therefore, be raised in order to bring it to the general level.

The resolution asks the Committee to suggest steps which should be taken for the improvement of education among the depressed classes as well as the Musalmans. The implication of the resolution being that the standard of education among the higher classes of Hindus should be considered as a level to which the standard of education of classes (1) and (2) should be lifted.

* In the Census Report (1921), volume I, part I, page 225, the depressed classes in the United Provinces are estimated at nine millions plus a large proportion of an additional seven millions.

We admit that there has been some increase of literacy among the male Muslim community attributable to a great extent to the institution of special Islamia schools such as maktabas and Islamia schools, but we are not prepared to say that the community, taken as a whole, is not educationally backward compared to the Hindu community taken as a whole. This is still more markedly noticeable if we take castes separately and compare their literacy. We take the following from the Census Report, 1921, volume XVI, part I, page 126 :—

| Hindus. | | | Per thousand. | Muslims. | Per thousand. |
|-----------|----|----|---------------|----------|---------------|
| Kayasthas | .. | .. | 523 | Syeds | 210 |
| Agarwalas | .. | .. | 398 | Mughals | 145 |
| Brahmans | .. | .. | 191 | .. | .. |

From the same report at page 118, we find that the Muslims have a superiority only in the age period 20 and over.

The figures for literacy of the various communities (including males and females) in these provinces are as follows :—

| Class. | Population. | Literate. | Percentage. |
|--|-------------|-----------|-------------|
| (1) Muslims | 6,481,032 | 243,937 | 3·76 |
| (2) Hindus — | | | |
| (a) Agarwalas, Brahmins, Kayasthas, Rajput, Jat, and other high caste:— | | | |
| British district totals | 10,597,917 | 919,365 | 8·67 |
| (b) Untouchables, i.e. Agrahi, Bhangi, Bhar, Chamar, Koli, etc. | 13,973,193 | 69,739 | ·49 |
| (c) Other depressed classes | 14,698,816 | 146,639 | ·99 |
| Total of literacy among untouchable and depressed classes :— | | | ·71 |
| (3) Jains | 67,883 | 20,748 | 30·56 |
| (4) Sikhs | 14,234 | 2,947 | 20·70 |
| (5) Buddhists | 488 | 60 | 12·29 |
| (6) Christians | 200,718 | 47,511 | 23·67 |
| (7) Parsis | 925 | 692 | 74·81 |
| (8) Jews | 41 | 28 | 68·29 |

Thus even if the depressed classes be not excluded from the Hindu population the percentage of literacy among Muslim males is lower even than the percentage of Hindus and, of course, still lower as compared with the Christians and other communities.

The standard is still lower for the younger generation. The scope of this Committee's inquiry is confined to the state of the primary education of boys of the Muslim community with a view to bringing them up to the general level. For all practical purpose, therefore, the male population of the age period 5 to 10 years (for which definite figures are available in the census report) will come within the scope of the committee's inquiry. If therefore, we limit ourselves to these figures for the British districts only and curtailed our inquiry still further by taking the population of boys of the age period 5 to 10 distinguishing mere literacy from literacy in English we can easily deduce the comparative percentages :—

(1) In volume XVI, Part I of the Census Report (1921), at page 120, are given the following numbers per mille who are literate persons between the ages 5 to 10 and 10 to 15 :—

| | 5 to 10 | 10 to 15. |
|---|---------|-----------|
| All religions | 14 | 62 |
| Hindus, including depressed classes | 19 | 60 |
| Arya | 112 | 341 |
| Brahmans | 571 | 909 |
| Muslims | 12 | 54 |
| Christians | 132 | 251 |

(2) Volume XVI, Part II of the Census Report gives the following figures :—

Males from 5 to 10 years in British territory.

| | |
|--|-----------|
| (a) All religions | 8,311,780 |
| (b) Hindus (including Aryas and Brahmans with depressed classes) | 2,846,020 |
| (c) Muslims | 486,303 |

Literate males from 0—10 years in British territory.

| | |
|--|--------|
| (a) All religions | 46,231 |
| (b) Hindus (including Aryas and Brahmans with depressed classes) | 37,367 |
| (c) Muslims | 6,069 |

The figures yield the following percentage :—

| | |
|-----------------------|------|
| All religions | 1.38 |
| Hindus | 1.32 |
| Muslims | 1.25 |

This proportion of literacy is still further reduced when we take the urban figures into account. The Muslim population is confined more or less to municipal areas, and the proportion of Muslim literacy in these areas is still more disappointing as the following figures will show :—

Volume XVI, Part II, Census Report, 1921, pages 128, 130 and 132 give the following figures for 24 cities :—

| (1) All ages, males. | Population. | Literate. |
|-----------------------|-------------|-----------|
| All religions | 1,216,940 | 258,949 |
| Hindus | 726,811 | 160,502 |
| Muslims | 433,347 | 68,180 |

The percentage for these three sets of figures comes to—

| | |
|-----------------------|----|
| All religions | 21 |
| Hindus | 22 |
| Muslims | 15 |

(2) Ages 5 to 10—

| | | | | | | |
|---------------|----|----|----|----|---------|-------|
| All religions | .. | .. | .. | .. | 192,126 | 8,723 |
| Hindus | .. | .. | .. | .. | 74,825 | 5,407 |
| Muslims | .. | .. | .. | .. | 53,195 | 1,958 |

The percentages comes to—

| | | | | | | |
|---------------|----|----|----|----|----|------|
| All religions | .. | .. | .. | .. | .. | 6.60 |
| Hindus | .. | .. | .. | .. | .. | 7.23 |
| Muslims | .. | .. | .. | .. | .. | 3.67 |

The basis of calculation may plausibly be the percentage of boys in attendance at schools to the total male population of school-going age (i.e. 5 to 12). Correct figures for this period are not available, but approximately the Muslim percentage worked on these figures is not more than 3.75 to 7.50 of the Hindus. It cannot be too often repeated that mere percentage of scholars belonging to a community in any particular year without regard to its general illiteracy is no true test of the actual advance made by that community, but even if this test be applied it will appear that the position of Muslim boys is by no means strong.

We take the following from the general reports on Public Instruction in the United Provinces:—

In 1920-21 number of Hindus under instruction increased in that year by 4 per cent., while that of Muslims only by 2½ per cent.

In 1921-22 the percentage of the Muslims to pupils of all creeds is 15.7.

In 1922-23 the Hindus under instruction increased by 5.3 per cent., while the Muslims by 3.4 per cent.

In 1923-24 the increase of the Muslim boys is shown as 9.3 per cent. as against 6.2 per cent. of the Hindus. This percentage is, however, misleading, because there has been a steady decline in the rate of progress during the years 1920-21, 1921-22, and 1922-23. The percentage of increase for the last four years is lower for Muslims than for Hindus.

The annual percentage of Muslim boys to the total number of all religions undergoing primary education was as follows:—

| | | | | | | |
|---------|----|----|----|----|----|------|
| 1920-21 | .. | .. | .. | .. | .. | 14.3 |
| 1921-22 | .. | .. | .. | .. | .. | 16.0 |
| 1922-23 | .. | .. | .. | .. | .. | 15.7 |
| 1923-24 | .. | .. | .. | .. | .. | 16.2 |

The increase shown is largely due to the fact that a large percentage of the population is residing in urban areas where Muslims are concentrated and where in some municipalities principally inhabited by Musalmans, compulsion is in force, but taken singly here, too, they are, as shown previously, much more backward (6.67 as against 7.23 of the Hindus). Thus from whichever point of view the position may be judged, Muslim backwardness in education is not a matter which is capable of any doubt.

Increase in recent years is due to the incentive given to Muslim primary education by the famous resolution of Sir James (now Lord) Meston's Government of August, 1914. This resolution conceived in a beneficent spirit by the Government has been carried out in a spirit of "consideration for the foster child" by those charged with its execution.

Under this resolution of 1914 provision was made for the establishment of special Muslim schools and the improvement and encouragement of maktabas. The pivot of the whole scheme, however, was the Muslim Inspector whose duty was on the one hand to advise the Government in the interest of the scheme and on the other to organize Muhammadan effort for establishment of Islamia schools and for qualifying private schools for grants-in-aid. The Muslim Inspector has not existed for some years, his duties having been entrusted to other officers of the department. Under the resolution of 1914 "the District Boards shall start a special Islamia school and provide it with a qualified Muhammadan teacher" where an attendance of at least 20 Moslem boys could be secured, regardless of the fact whether there existed any primary school or not at the place where special Islamia school was required to be started. Had this resolution been loyally carried out Muslim education would have had a spurt, but only minimum expenditure based on previous actuals is provided under the present contract, and, although district boards can generally afford funds for pathshalas, special Islamia schools and maktabas which derive their authority from the Government resolution are being starved out and several Islamia schools and maktabas have closed and are now closing. There is no question of starting new Islamia schools and maktabas under the circumstances obtaining at present.

We admit that the Islamia schools do not come up to the standard of mixed schools, but the fault is not of the system, it is the machinery that is at fault, and we hope that, in order to properly and effectually stimulate Muslim education, the system shall be maintained in the spirit of the resolution of 1914. The entire Muslim community of these provinces shall view with great disfavour and alarm, any proposal for their abolition.

Muslim teachers and Muslim inspectorial staff play an important part in the recruitment of Muslim boys. In mixed schools tutorial element has been systematically on the wane. We find in the report of the Education department for the year 1922-23 a paragraph to the following effect:—"The number of Muhammadan teachers in ordinary vernacular schools has fallen from 2,932 to 2,656, i.e., by 276." This rather significant fact is explained on the ground that "the encouragement of Islamia schools and maktabas is tending to reduce the Muhammadan element in the ordinary schools." In resolution no. III of August, 1914, referred to above, it is clearly laid down that "facilities will be given for a proper infusion of Muhammadans among the teachers and the inspecting staff." Had any step been taken to give effect to the above-mentioned part of the Government resolution there could be no reduction in the number of teachers of ordinary board schools. Although several new ordinary vernacular schools have been opened since the year 1922-23 the number of Muslim teachers has still further declined to 2,368. The number of Hindu teachers, however, is 22,814. The proportion of Muslim teachers is remarkably low in most of the districts. We quote only, for example, Muzaffarnagar, which has a large Muslim rural population. It employs only 15 Muslim teachers out of 164, Aligarh 33 out of 515, Muttra 9 out of 401, Agra 24 out of 573, Mainpuri 11 out of 425, Etah 22 out of 423, Farrukhabad 31 out of 575, Etawah 7 out of 506, Cawnpore 17 out of 790, Fatehpur 41 out of 444, Benares 36 out of 1,176, Ballia 6 out of 759, Gorakhpur 21

out of 1,494, and Azamgarh 57 out of 908. In the Kumaun and Jhansi divisions the percentage is inordinately low.

The percentage of teachers in municipal schools is somewhat higher than in the district boards, but much less than the status of Muslims in towns and their educational needs demand. It is no wonder, therefore that the ratio of population of these mixed schools which admits only high caste Hindus and Muslims should be seven to less than one in district boards. Hindu (boys only) in mixed schools number 763,883 and the Muslims 137,220 only.

With regard to special inspectorial staff we emphatically urge its retention and increase. The paucity of the staff has been constantly urged by the community without any response. Its retention has been recommended even by the inquiry committee of which our colleague in the committee, Pandit Nanak Chand, was a member.

The above will, perhaps, suffice to show the general backwardness of the Muslim education, the need for special schools to stimulate that education, and the causes retarding the progress of that education.

We agree with the President's interpretation of the words "general level." They connote not only the quantity, but also the quality. We have admitted that the quality of education in Islamia schools is inferior, but in areas where the Primary Education Act of 1926 is to be enforced, both of these questions will lose much of their force. In areas where the Act will be applied every boy of the school-going age will have compulsorily to receive education. The only question would be, how should the education be imparted and what should we teach. The question of number is immaterial.

We feel no doubt whatsoever that the conversion of Islamia schools into mixed schools will not have the approval of the Muslim community, and, therefore, we strongly plead for more sympathy for the Islamia schools which should be raised to the level of mixed schools. In the latter class of schools we recommend that a minimum should be fixed for the admission of Muslim boys. As an experimental measure we will even approve of the conversion of Islamia schools into mixed schools *only* in areas where Compulsory Primary Education Act has been enforced, but subject to the following conditions:—

- (1) That there is an adequate Muslim representation in the teaching staff of boards' schools. The number of Muslim teachers in municipal schools should be 40 per cent. in rural areas at least 30 per cent.
- (2) Adequate provision is made for religious education.
- (3) Every facility is given for the teaching of Urdu from teachers knowing the Urdu language.

With regard to maktabas we regret that we cannot approve of all the conditions recommended by the committee for aided schools of all kinds. These conditions, if rigidly enforced, will lead to stoppage of grants to maktabas. As matters stand at present, boards are none too liberal in making grants to maktabas. We cannot approve of insistence on enrolment of 20 pupils and an attendance of 75 per cent., nor of the qualification of the teacher, nor do we approve of the fixing of syllabus which must be left to the Muhammadan Education Text-book Committee. We advocate a policy of free and liberal grant-in-aid to maktabas.

Maktabas serve a distinctive purpose and impart religious instruction. These are indigenous institutions and appeal specially to a very large number of conservative Muslim parents, who attach more importance to religious education and the teaching of Urdu and Persian. In the following suggestions that we are making for the improvement of Muslim education in order to bring it to the general level, we believe we have the approval of our community :—

- (1) No other duties should be assigned to the Inspector of Muhammadan schools, and his office establishment should be an integral part of the office of the Director of Public Instruction. The post of the Inspector of Muhammadan schools is now vacant and we strongly recommend that it should be filled up immediately; the status and position of the Inspector of Muhammadan schools should be the same as of Divisional Inspectors.
- (2) The power of the Muhammadan Deputy Inspectors at present is very restricted, with the result that their utility is much curtailed. We are, therefore, of opinion that the Deputy Inspectors should be authorized to correspond directly with the Inspector of Muhammadan schools and also with the Muhammadan Education Committees of the district under their jurisdiction. In the resolution of Lord Meston's Government it was clearly mentioned that the Deputy Inspectors would be under the Divisional Inspectors; and they should continue to remain under them instead of being under the Assistant Inspectors, as is the case at present.
- (3) A Sub-Deputy Inspector or a supervisor be appointed in each district to look after the Islamia schools and maktabas.
- (4) The formation of Muslim Education Committees should be obligatory, and not optional; and they should be advisory bodies to the municipal and district boards.
- (5) The Chairman of the Muhammadan Education Committee should be a gazetted officer selected by the District Magistrate as in the old constitution. The Secretary of the Muhammadan Education Committee should ordinarily be a Muhammadan Deputy or Sub-Deputy Inspector of schools.
- (6) The powers regarding appointment, leave, arrangement, dismissal, transfer, control of teachers in Islamia schools and maktabas should be vested in the Muhammadan Education Committee or in its Chairman, in the same way as similar powers for boards' schools are proposed to be vested in the Chairman of the Education Committee or of the board.
- (7) The boards be made not to take any action on any question dealing with the Muhammadan education and particularly with Islamia schools and maktabas without consulting the Muhammadan Education Committee whose opinions ought to carry great weight with the board in their deliberations.
- (8) The board should require the Muhammadan Education Committee to prepare a budget for Islamia schools and maktabas and for the educational requirements of the Mussulmans

and incorporate it in the general education budget of the board.

- (9) The savings, if any, in the budget allotments of Islamia schools and maktabas should be utilized for the development of Muslim education and should be at the disposal of the Muhammadan Education Committee.
- (10) The power of selecting Muhammadan candidates for teachership in vernacular schools, training classes, and normal schools should be vested in the committee. The committee may be required to take assistance from the Muhammadan Inspecting Officer of the district or in special cases from the Special Muhammadan Deputy Inspector of the division.
- (11) In order to avoid unnecessary delay and misrepresentation of their requirements, the Muhammadan Education Committee should be authorized to correspond directly with the Deputy Inspector and the Inspector of Muhammadan schools.
- (12) The District Muhammadan Education Committee should also be required to prepare an annual report on the progress of Muslim education in the district. The report should mention the principal events and give an account of the income and expenditure every year. It should incorporate all the proposals made by the committee, but rejected by the board. A copy of this report should be sent direct to the Deputy Inspector and to the Inspector of Muhammadan schools.
- (13) The Muhammadan Education Committee to be supplied by the board all papers dealing with Muslim education, such as statements showing the number of free and half free scholars, number of scholarships, number of teachers and scholars, for preparing statements with regard to Muslim education. We urge also reservation of a fixed proportion of free and half free scholarships for Muslim boys. We would fix the proportion at 30 per cent.
- (14) Muslim girls' schools should also be under this committee.
- (15) For safeguarding the educational interests of the community it is necessary that a fixed amount be set aside for maktabas and Islamia schools, the grant so ear-marked should not lapse at the end of the year. The local boards be required further to contribute sufficient funds to meet emergencies such as opening of new schools or maktabas.
- (16) It is also desirable that Muhammadan Education Committees should be formed in municipalities and individual areas on the same lines and with the same powers as the committees suggested for Muhammadan education in the district boards.
- (17) The board allows contingent charges, equips the schools maintained by it and also the school for depressed classes, but no such provision is made for the maktabas. We, therefore, recommend that maktabas should be equipped, and the contingent charges should be provided by the board in the same way as is done in the case of schools for depressed

classes. The inspection of the maktabas should be confined to Muhammadan members of the board, Muhammadan educational officers or other Muhammadans appointed by the board, as the text-books generally contain lessons on theology.

- (18) It is also desirable that a Muhammadan clerk should be assigned to the Muhammadan Education Committee who should keep all the records dealing with the maktabas and Islamia schools and other matters connected with Muhammadan education.
- (19) According to recent rules teachers trained in Islamia primary training classes are not eligible for appointment as teachers in any schools except maktabas. We suggest that such teachers of the Islamia training classes as have passed the vernacular final examination should not be debarred from becoming teachers in the board schools and particularly in Islamia schools.
- (20) Some boards in these provinces have issued instructions that Hindi should be taught as a compulsory subject in Islamia schools. Such an order is against the object for which Islamia schools were established, and is opposed to the intentions of the Government repeatedly announced in various resolutions. Such orders of the boards should not be allowed to have any effect.
- (21) The number of Muhammadan teachers in the boards' schools and, particularly, the number of head masters in the middle vernacular schools is very limited, as shown above. In most of the districts in these provinces there is hardly a single head master of a vernacular middle school, and the number of Muhammadan teachers at present is very small. They are usually appointed as teachers of oriental languages and are consequently debarred from becoming head masters of middle schools. It is necessary that a definite proportion of every class of teachers should be fixed for every type of school, and this proportion should be different in different districts, varying from 30 to 40 per cent., according to the population of the Muslim community.
- (22) In certain districts the salary of Muslim teachers in ordinary board schools is paid out of the grants reserved for Islamia schools and maktabas. This is against the intention of the Government grant which should be reserved exclusively for the purpose for which it is given.
- (23) It is also necessary that an adequate number of primary scholarships should be reserved for Muslim scholars passing the upper primary examination in the same proportion as we have recommended for teachers—30 to 40 per cent.
- (24) Some of the boards have issued instructions that all their correspondence should be carried on exclusively in Hindi written in the Nagri character. This has created a great deal of excitement and agitation among the Mussulmans.

as it is opposed to the settlement arrived at by the Government of Sir James La Touche. This practice will be a source of great annoyance and inconvenience to all the persons who do not know Hindi, for teachers of Islamia schools, maktabas and of Muhammadan girls' schools, according to this rule, will be compelled to correspond in Hindi.

- (25) In the hostels attached to the middle schools cooking sheds and servants are provided for Hindu students, while Muhammadans are left to shift for themselves on the ground that their number does not justify separate arrangements. Our experience is that the number of Muhammadan boarders does not increase, simply because suitable kitchen arrangements do not exist. If a Muhammadan superintendent or assistant superintendent is appointed in charge of the Muslim boarders with suitable kitchen arrangements the number is sure to increase.
- (26) The number of Muhammadan candidates for the normal schools is fixed for each district. This number is very inadequate and should be increased in the proportion already mentioned, i.e., 30 to 40 per cent. We also beg to recommend that the number of Muhammadan candidates for the training classes should be fixed in the same way, and that they should be selected by the Muhammadan Education Committee, as already mentioned.
- (27) The curriculum of studies for Islamia schools should be drawn by the Muhammadan Education Text-book Committee.
- HAFIZ HIDAYAT HUSAIN.
ZIA-UD-DIN AHMAD.
* MASOODUL HASAN.
RAO ABDUL HAMID KHAN.

* Signed in addition to the separate note.

APPENDIX K.

The joint note of the five Hindu members of the committee.

This note is intended to serve a twofold purpose. In the first place, we should like to deal in greater detail than has been done in the main report with the question of the alleged educational backwardness of Muslim boys, and, incidentally, to examine the various statements that are generally put forward by Muslim publicists in support of their contention. The importance of the subject demands that it should be thoroughly discussed. Since 1909, whenever the problem of primary education in these provinces has been under consideration, the question of Muslim backwardness has been raised, and raised in such a form as to exert a profound influence over the growth of our system of elementary instruction. And yet, in the past no serious attempt was made to inquire into the alleged educational backwardness of the Muslim boys. It is, therefore, a matter for satisfaction that the Wetherill Committee, consisting of Hindu, Muslim and Christian members, official and non-official, should, after a prolonged inquiry, have arrived at a unanimous finding that the alleged backwardness was nothing more than a myth, and that a majority of the committee,—one Muslim, two European and five Hindu members—should have further recommended the gradual elimination of the separate educational facilities provided under the Meston Resolution for Muslim boys, because, they have adversely affected the quality of instruction imparted to them. In the second place, we deem it necessary to state in full the reasons for the attitude adopted by us in the consideration of the various issues raised in the course of our inquiry, and also to state frankly the grounds on which we have accepted a compromise here and there, in spite of our holding clear and definite views on those points. We are constrained to do so, owing to the action of some of our respected Muslim colleagues who informed us at the last meeting, after the report had been signed, of their intention to go back on the compromise and to append a separate note of dissent even on those points on which the committee had by agreement arrived at unanimous findings.

2. In dealing with the subject, we do not propose to follow the order in the report, because in our opinion it is not conducive to convenience, although we realize that the terms of reference made it necessary for the committee to prefer the arrangement of the subject as given in the report. We shall consider the following points in the order in which they are given:—

- (a) Whether Muhammadans are educationally backward;
- (b) whether there should be one mixed type of district board schools; or whether, along with the district board mixed school, there should be district board Islamia schools and Hindu pathshalas;
- (c) whether religious instruction should be permitted during school hours, and, if so, under what conditions;
- (d) whether it is desirable to fix the proportion of district board teachers and the members of the inspecting staff on communal lines, and, if so, what would be the fair and equitable basis for determining the proportion;

(e) whether the existing rules regulating the grants to aided (vernacular primary) schools of all kinds require modification, and, if so, in what direction; and

(f) whether a separate inspecting agency should continue.

3. In regard to the alleged backwardness of the Muslim community in the matter of education, we should like to make a passing reference to the lack of unanimity among their representative spokesmen as to what should constitute the standard by which their backwardness is to be measured. As has been indicated in the report, the committee was presented from day to day with novel and far-fetched interpretations of the phrase "the general level", in the terms of reference. So scholarly a gentleman as our esteemed colleague, Dr. Zia-ud-din Ahmad Sahib, was of opinion that the standard to be taken should be the highest level attained by any community or a section of a community. Ultimately, the definition of the expression of "the general level," which had been put forward by one of us at the very first meeting, was adopted by the whole committee as the right one. Accordingly, in this note we shall use the term "the general level", as defined by the committee in paragraph 6 of their report. Similarly, there seemed to be considerable hesitation among the Muhammadan publicists as to whether the figures of literacy for the various communities, as given in the latest census report, should alone be taken into consideration in deciding the question of the relative backwardness of one community or another, or whether the census figures should be discarded and the question settled by a reference to the number of scholars reading in the vernacular primary schools of all kinds as supplied to the committee by the Department of Education. On this point there have been violent fluctuations of opinion. The pendulum seems to have oscillated in quick succession from one side to the other, and then back again. It would, however, appear that they have, for the time being, chosen to let their case stand or fall on the basis of the figures in the census report. Out of our desire to do full justice to their view-point, we shall begin the examination of this point by taking the census reports for 1901, 1911 and 1921, and see if the allegation of the Muhammadan community regarding their educational backwardness is borne out by a study of these reports.

4. Roughly speaking, the total male population for the 48 (British) districts of these provinces is 23·8 millions, of whom 3·4 millions are Muslims, one lakh Christians, and the rest Hindus (including approximately 4·6 millions of males belonging to the depressed classes). The following statement shows in a tabular form the comparative progress made by the Hindus and the Muhammadans in literacy during the twenty years, 1901 to 1921 :—

| Year. | Per 1,000 males. | | | |
|------------|------------------|---|----------|---|
| | Hindus. | Increase per cent. as compared with 1901. | Muslims. | Increase per cent. as compared with 1901. |
| 1901 | 55 | .. | 52 | .. |
| 1911 | 78 | 3·5 | 59 | 13·2 |
| 1921 | 62 | 10·7 | 65 | 25·0 |

5. In this connexion it is interesting to note the curious error into which the Census Commissioner of the United Provinces for the year 1921 seems to have fallen—an error which is as inexplicable as it is baseless. In his report, part I, chapter 8, paragraph 12, page 118, occur the following words:—

“Of the two main religions the Hindus have progressed more than the Muhammadans As regards males only the Hindu proportion is now 67 and the Muhammadan 65 (per 1,000 males). In 1911 figures were 58 and 59, respectively. As the Muhammadans have a superiority only in the age-period 20 and over, it seems likely that they will in the next decade fall further behind.”

6. That the above is a palpable misrepresentation of the true facts, is susceptible of easy demonstration. The Census Commissioner in the above quotation gives the Hindu proportion as 67 for males of all ages, while on page 120 of his report (part I) he gives 70 literates per thousand Hindu males of five years and over as against 74 for the Muslim males of the same age-period. If both the sets of his figures are accurate, then it follows that the Hindus must have got an overwhelmingly large number of literates among males of the age-period 0—5 years, in order to convert the Muslim superiority of four per thousand males of five years and over into inferiority of two per thousand males for all ages. The above proposition on the face of it is absurd. But this is not all. If we turn to part II of his volume and look into the detailed figures given in table VIII, we find that the Hindu proportion of literate males is 62.—not 67 as stated by the Census Commissioner,—and the Muhammadan proportion 65, for all ages. The figures relied upon by the Census Commissioner being unreliable, the inference drawn by him from those figures, namely, that ‘it seems likely that they (Muslims) will in the next decade fall further behind,’ falls to the ground.

7. There is yet another point that merits consideration before we pass on to deal with another aspect of the question. It is urged that the depressed classes should be excluded from the Hindu community as their inclusion has the effect of unduly reducing the percentage of literacy among the Hindu community. It is admitted that the various sections of the Hindus are not equally advanced in the matter of education, and we wish very much that the progress had been uniform so that an equal proportion from among the various sections of the Hindu community should have been able to read and write. But similar disparity among the various sections of the Muslim community is also to be found. If there are among the Hindus some sections that are as advanced as Kayasthas, Agrawals and Brahmans and backward sections like Pasis and Bhangis, then a close study of the figures relating to the Muslim community reveals a similar state of things. For instance, the number of literates per thousand males among the Muslim community was as follows in 1911 and 1921:—Saiyeds 210, Moghals 145, Rajputs 114, Sheikhs 107 (in 1911), Pathans 88 (in 1911), Neo-Muslim 40, Julabas 30, Qassab 19, Gujars 19, Dhuuja 12, Bhangi 5, Darzi 4, Faqirs 3, Manihars 3, Turks 3, Pasis 3, Kanjaras 2, Nats 2, Bhisti 1·3 and Gaddi 1. It is thus obvious that if an attempt is made to split up the Hindu community into the backward and advanced sections, the same should be done in the case of the Muslim community. This uneven distribution of education among the various sections of one community or another is

due not to the difference in creed but to differences in surrounding and avocations, so that the men following the same or similar professions, though belonging to different communities, show similar degree of advancement in the matter of literacy. The urban classes have got a larger proportion of literates than the rural classes; and the professional classes of both the communities exhibit a higher standard of literacy than the artisans who in their turn are more advanced than those who follow agriculture or lead a pastoral life. The line of demarcation between the advanced and the backward sections of the communities is not along communal but vocational lines; it is horizontal, not vertical. Mr. Blunt who was a Census Commissioner for the United Provinces in 1911, arrived at the same conclusion. In his report he states that "the non-agricultural caste finds use for literacy, the agricultural caste does not". And Mr. Edye in the last Census Report makes a similar statement. In these circumstances, it is not fair to suggest the splitting up of the Hindu community alone. If a comparison is to be instituted between the two communities with a view to finding out which of them is more advanced in the matter of education, one should not leave out the backward section of one community and compare only its advanced section with another community including the advanced and backward sections.

8. It is further suggested that the Muhammadans may be more literate than the Hindus, but, as their superiority is more marked in the age-period, 20 years and over, they are likely to lose their advantage and fall behind in the next decade. The following statement will show that even during the last 20 years which have witnessed the rapid advance of the Muslims in literacy as compared with that of the Hindus, the Muslim males of the age-period 0—10 years did not have a larger proportion of literates than the Hindu males of the corresponding age-period:—

| Years. | Literates per 1,000 males of 0—10 years. | | | |
|------------|--|----------|-------------|----------------|
| | Hindus. | Muslims. | Christians. | All religions. |
| 1901 | 6 | 6 | 14·9 | 6·6 |
| 1911 | 8 | 8 | 8·2 | 8 |
| 1921 | 6·9 | 6·75 | 7 | 6·8 |

From another point of view also, it can be shown that the apprehension regarding the possible decline of the Muslim community in literacy during the next decade is groundless. For instance, although the Muhammadans constitute 14·7 per cent. of the total population in these

provinces, the percentage of Muslim scholars in primary schools of all kinds was as follows —

| Year. | Total enrolment in vernacular primary schools. | Total number of Muhammadan boys attending such schools. | Percentage. |
|---------------|--|---|-------------|
| 1919-20 | 759,097 | 136,662 | 18·0 |
| 1920-21 | 804,870 | 138,519 | 17·2 |
| 1921-22 | 787,376 | 139,461 | 17·7 |
| 1922-23 | 831,664 | 142,843 | 17·2 |
| 1923-24 | 865,575 | 170,553 | 19·2 |

In view of these figures, it is certain that far from losing ground, the Muslim community will continue to make progress at the same rate at which it has advanced during the last 20 years. Those who have been frightened by the gloomy prospect of the future deterioration of the Muslim community, as drawn by the last Census Commissioner of the United Provinces, may rest assured that their fears are unjustified and that Mr. Edye's conclusions are as unreliable as his figures are inaccurate.

9. In certain Muslim quarters although the provincial superiority of the Muhammadan males over the Hindu male population in literacy is acknowledged, it is pointed out that in the twenty-four cities they are less advanced—the proportion for the Muslims and Hindus being 150 and 221 per 1,000, respectively. This would be a valid objection to an assertion, if made by any one, that the Muslim males were equally advanced all over the provinces. But no one has ever suggested that. If the Hindus have a superiority over the Muslims in the twenty-four cities, the former are relatively much more backward than the latter in the rest of the province. The total male population of the twenty-four cities is, roughly, a little over 12 lakhs, of whom 7·3 and 4·3 lakhs, are Hindus and Muslims, respectively. In other words, less than one-eighth of the total Muslim male population in the provinces is to be found in the twenty-four cities. And the proportion for the provinces including these twenty-four cities is 70 for the Hindus and 74 for the Muslims, if we take the figures for males of 5 years and over. In 35 out of 48 districts, the Muhammadans have got a larger proportion of literates than the Hindus; and in some cases, their superiority is remarkably high. That they have not only been able to maintain in 1921, the position held by them in 1911, but have succeeded in improving it, is proved by the fact that, while they were relatively backward in 17 districts in 1911, they were found in 1921 to be behind the Hindus only in 13 districts. In order, however, to appreciate the full extent of the advantage they have over the Hindus, a detailed study of the figures relating to districts is recommended. For instance, in 1921, the Allahabad district had 68 literates among Hindus and 130 among Muslims per 1,000 males of 5 years and over; while the corresponding figures for Lucknow were 88 and 165, respectively. Another argument put forward to prove the educational backwardness of the Muslim

community in these provinces is that while the All-India proportion of literates among Muslim males is 93, the provincial average is only 74. On this basis, the Hindu community is even more backward, as the corresponding figures for it are 137 for All-India and 70 for these provinces.

10. So much for the claim put forward by the Muhammadans on the basis of the figures given in the various census reports. Let us now turn to the departmental reports on education, and see if the Muslim boys are not taking advantage of the educational facilities provided by the State in adequate numbers, namely, whether on the basis of population a smaller proportion of scholars are Muslims. For the year 1923-24, we find that there were, roughly, 6,200 scholars reading in various universities and arts colleges (including associated intermediate colleges) of whom about 1,600 or 26 per cent. were Muslims. (If in the Aligarh Muslim University scholars belonging to the outside provinces are reading, the same is the case in the Benares Hindu University and other colleges). Nearly 93,000 boys were receiving English or vernacular secondary education; of these over 15,000 or 15 per cent. were Muhammadans. Similarly, among 886,000 male scholars attending vernacular primary schools of all kinds 1,70,000 or 19 per cent. were Muslim boys. Thus, although the Muslim males constitute only 14.3 per cent. of the total male population of the provinces, roughly, 26 per cent. of the scholars receiving higher education are Muslims, while in secondary and primary schools they number 16 and 19 per cent., respectively. The conclusion from these facts is irresistible: that the alleged backwardness of the Muslim community or its apathy towards western education is a fiction.

11. It might be objected that the state of things as shown by the figures for 1923-24 is not normal. But the objection is not well-founded. We have given above the figures relating to scholars reading in vernacular primary schools of all kinds for four years from 1919-20 to 1923-24, which clearly demonstrates that the progress is by no means spasmodic, it is on the other hand, normal. The truth of this assertion can be demonstrated by a reference to the number of Muslim boys attending vernacular primary schools (recognized) from 1915-16 onwards. Appendix A gives the figures taken from the Table no. III of the Annual Reports of the Department of Education for the years concerned. The table given below summarizes the figures contained in that appendix:—

| Year. | Percentage of Muslim boys to total number of boys reading in recognized vernacular primary classes. | | |
|---------|---|----|------|
| 1916-17 | .. | .. | 14.3 |
| 1918-19 | .. | .. | 16 |
| 1921-22 | .. | .. | 16 |
| 1924-25 | .. | .. | 18.5 |

12. There is one aspect of the question that requires consideration. It was suggested by our esteemed Muhammadan colleagues of the

committee that the depressed classes should be excluded before any proper comparison can be instituted. We have accordingly compiled the following table on the above basis :—

| United Provinces (British). | Male population (in lakhs). | Scholars (in thousands). | Per cent. |
|-------------------------------|-----------------------------|--------------------------|-----------|
| All communities | 2·33* | 8·86† | 3·7 |
| Hindus | 2·03* | 7·13 | 3·5 |
| (a) High caste | 1·57* | 6·90 | 4·4 |
| (b) Depressed classes | 40* | 23‡ | ·5 |
| Muslims | 34* | 1·70‡ | 5·0 |
| Indian Christians | 86* | 3·2 | 3·7 |

The table shows clearly enough that even if the depressed classes are omitted, the Muslims remain at the top followed at a respectable distance by the Hindu and Indian-Christian communities.

We should like to add that a similar table given by Revd. Canon Crosthwaite in his note submitted to the committee, though not altogether free from inaccuracies in regard to figures, bears out the truth of our contention.

13. Having dealt with the figures relating to the scholars belonging to the various communities in the provinces as a whole, we propose to consider separately the state of primary education among the boys of the communities concerned in the rural and urban areas. At the outset, it should be made clear that no figures are available for the boys residing in the areas under the jurisdiction of the Cantonment Authorities. We are, therefore, concerned only with the boys attending schools managed or aided by the district and municipal boards. Taking the district boards first, we find that the male population under their jurisdiction totals, in round figures 22 millions, of whom 12·6 per cent. are Muhammadans. Of nearly 8,38 thousand boys in primary schools within the area under the district boards, 142,000 or 16·9 per cent. are Muslim. Similarly, in the municipal area although the male Muslim community constitutes 36·4 per cent. of the total male population, the proportions of the Muslim scholars to the total number of boys at school is 45·6 per cent. In this connexion, we wish to draw the attention of the Government to a most disquieting state of affairs disclosed by a statement supplied to the committee by the Department of Education, as regards the education of Hindu boys reading in municipal

FOOT-NOTE.—* Of Census Report, United Provinces, 1921.

† Director of Public Instruction's Report, 1923-24, appendix B, page 33b.

‡ Director of Public Instruction's Report, pages 32, 33.

schools of the Rohilkhand division. The present position would appear to be as follows :—

(Males only.)

| Municipalities. | Percentage of Hindu population to total population. | Percentage of Hindu scholars to total number of scholars. |
|----------------------|---|---|
| Bijnor | 41·8 | 18·2 |
| Moradabad | 41·4 | 10·6 |
| Shahjahanpur | 46·1 | 3·8 |
| Pilibhit | 38·7 | 22·5 |

Comment on the above is superfluous. We would urge on the Government the desirability of instituting an enquiry into the above and similar other cases with a view to ascertaining the causes responsible for so low an enrolment of Hindu boys even in places, like Moradabad, where compulsory elementary education has been introduced. We will further suggest that as soon as the inquiry has been made, a statement should be published so that the uneasiness caused by these figures may be removed.

14. We think we have shown by a reference to the relevant facts and figures that the allegation regarding the educational backwardness of the Muhammadan community is unsubstantial. But the fact that it should have gained credence for so long needs to be considered. Some light is thrown on the genesis of this mistaken belief by the report of the Karamat Husain Committee, 1913. The Committee, in chapter 2, paragraph 2, of their report, stated: "A reference to the statistical tables of 1895 will establish the fact that, at that time, 32·6 per cent. of the pupils belonging to these two sections were Muhammadans." They further added: "It is our duty to point out that there has been a steady and gradual retrogression and that the Mussalmans have been losing ground in the field of primary education. Their percentage, with regard to total number of students, has fallen gradually in the course of the last 18 years, from 23·6 per cent to 18·75 per cent." The Karamat Husain Committee claimed, and this claim has been repeated in every successive representation submitted to the Government by the Muslim educational conferences, that the Muhammadans should receive special consideration in the matter of education, as, "considering the class of Mussalmans who inhabit these provinces and comparing them with the rest of the population the submission that the Muslim educational needs should not be determined by their percentage but by their status, past history and present deplorable condition in the country is not at all unreasonable." The above views, we respectfully suggest, betray an utter lack of proper perspective. It may be true that in 1895 nearly 33 per cent. of the pupils were Muhammadans; but it only shows that at that time Hindus were not taking fair and adequate advantage of the educational facilities provided by the State; but with the gradual awakening in the country and the more widespread appreciation of the value of education, it is only natural that the schools should cease to be the monopoly of the boys belonging to any particular community, with the result that the relative proportion existing at any particular time is bound, in course of time, to

be altered. While the relative position of the Muslim community *vis-a-vis* the other communities may be changed, we assert that there has been no decline in the number of Muslim boys attending primary schools since 1895, but that it has been steadily increasing with the opening of more schools. At the present time there are in the provinces nearly 34 lakhs of boys of school-going age, of whom about 490,000 are Muhammadans. The percentage of boys attending schools to the total number of boys of school age for all communities is 26; while in the case of Muhammadans 40 out of every hundred boys of school age are actually undergoing instruction in primary schools of all kinds. Unless, therefore, it can be shown that there has been a fall in the number of the Muhammadan boys at school in recent years as compared with 1895, the demand for special treatment is untenable. It is further open to objection on higher grounds of public policy. It is the duty of a national Government not only to provide educational facilities for the education of all boys of school-going age, but to use compulsion on the parents to send their boys to school. With the introduction of the representative form of Government in the country, the need for the education of voters has become even more insistent. The problem of providing education to boys of all communities cannot be solved by spoon-feeding the boys of one community at the expense of others who have got as good a right to be educated as any other. It is in view of these facts that our committee has come to the unanimous decision that the Muhammadans are not backward.

15. Coming now to what should be the type of a school under the management of a local body we should like to place on record our deliberate opinion that there should be only one type of school, namely, the mixed school open to boys of all communities. In the written opinions placed before the committee by the representative spokesmen of the high-caste Hindus and of the depressed classes, it was stated that if Islamia schools were to be maintained at the expense of the board then similar facilities should be provided for the benefit of boys belonging to the educationally backward sections of the Hindu community also. We do not see how this just demand for the establishment of institutions similar to Islamia schools and meant for these backward sections can be resisted so long as the Islamia schools are not going to be abolished. The continued existence of the latter can no longer be justified on the ground that the Muhammadan community is educationally backward. It is the Hindus in general, and the depressed classes in particular, who are now, as they have always been, more backward in the matter of education. The committee have by majority decided that the establishment of separate institutions on the lines of Islamia schools for the Hindus in general, and the depressed classes in particular, should not be countenanced, because they felt that the creation of such separate schools would make the existing confusion worse. Convinced as we are that the policy of driving boys of tender age into communal schools that are maintained out of the public funds is suicidal to the larger interests of the country and fraught with incalculable dangers to the future peace and prosperity of our people, as also on the ground that the establishment of the Islamia schools has done more harm than good to the educational progress of the Muhammadan community we are strongly in favour of the total abolition of Islamia schools. The joint note of the President and Mr. Said-ud-din Khan Sahib clearly sets forth how

inefficient the Islamia schools are, and how incapable they are of improvement, as well as how grave the injury is, that they have been inflicting on the Muslim boys who have been receiving instruction therein. Those of us, who have had personal experience of the quality of instruction imparted in these schools, can bear witness to the truthfulness of their statement; and if we were interested in retarding the educational progress of the Muslim community, we should have pressed for their continuance instead of suggesting their abolition. It is claimed that the creation of Islamia schools has been responsible for attracting a larger number of Muhammadan boys than would have been otherwise possible. We think that in places, where Islamia schools are being run side by side with other schools managed or aided by district or municipal boards, the denominational institutions would appeal more to the communal instincts of a parent. But if the proportion of Muslim boys to the total number of boys at school in the year 1918-19, when these schools had only recently come into existence, is compared with that in 1923-24, it will be found that they have played a very insignificant part, if any, in stimulating the interest of Muhammadan parents. (Please refer to table given on page 11, paragraph 11 of this note.) These Islamia schools are open to another objection. The rule that only Muhammadan teachers should be employed in them, although they are maintained by the local boards, constitutes a flagrant breach of the repeated pledges given to the peoples of India by Her Gracious Majesty Queen Victoria and her successors. This deliberate exclusion of the members of certain important communities from occupying the posts of teachers in these schools, merely on the ground of religion, cannot be justified. We enter our most emphatic protest against the continuance of this policy which imposes a humiliating disability on Indians other than Muslims. That we are not actuated by any petty considerations of securing a few more jobs for the members of this community or that can be easily understood when we say that we are equally opposed to the exclusion of qualified non-Hindus from service as teachers in depressed class schools. Babu Khem Chand, M.L.C., in giving evidence before our committee strongly pressed us to recommend to the Government to make a rule to the effect that no non-Muslim shall be appointed to the post of a teacher in a depressed class school under the management of a local board. We, the Hindu members of the committee, did not consider it to be either just or fair to press this point on the committee; but if the rule relating to Islamia schools is not to be abrogated, then we think that the proposal of Mr. Khem Chand cannot be dismissed lightly. We are opposed to the one as to the other. We look upon both as wrong in principle and harmful from an educational point of view. We shall feel deeply sorry if Mr. Khem Chand's proposal is given effect to, simply because that there is disinclination on the part of the Government to modify the rule relating to Islamia schools.

15. Although we were and are of opinion that Islamia schools should be abolished immediately we have agreed to the compromise embodied in the report, proposing the gradual elimination of such institutions. We agreed to this compromise because we thought that by so doing we should be able to secure the support of the four of our esteemed Muhammadan colleagues. As they unfortunately, for reasons be known to them, have not accepted the compromise in the spirit in which it was

put forward by Mr. Said-ul-din Khan Sahib, we should like to make it clear that we are still of opinion that the further continuance of Islamia schools is detrimental from an educational point of view and also on grounds of financial wastage. In this connexion we may draw attention to the practice of admitting the Hindu boys in Islamia schools. This is done with the manifest object of complying with the rule requiring that average attendance of 20 boys in such schools should be guaranteed by their promoters. The admission of Hindu boys in schools where only Muhammadan teachers are employed and no provision for the teaching of Hindi exists, and which are established with the sole object of catering for the needs of the Muhammadan boys, is open to serious objection.

16. In view, however, of the majority recommendation that the Islamia schools should be gradually eliminated we should like to make for the consideration of the Government the following proposals with a view to implementing that recommendation :—

- (a) The establishment of additional Islamia schools should be stopped;
- (b) that, of the existing Islamia schools, those should be immediately abolished which are located in villages that have also got a district board mixed school or maktab, and (c) the remaining Islamia schools should be gradually converted into mixed schools within a period not exceeding five years.

17. As has been stated in the main report, the Muslim members of the committee were prepared to consider the immediate abolition of Islamia schools, provided (a) that the text-books were improved; (b) that the satisfactory provision for the teaching of Urdu was made; (c) that the proportion of the Muhammadan teacher to be employed in the district or the municipal board school was fixed; and (d) that religious instructions within school hours was allowed. In regard (d) the Hindu members of the committee had deep-rooted objection to the turning of a mixed school into an arena of theological controversy; they pointed out to the impossibility of securing competent and reliable teachers, specially in rural areas; they also felt that in view of the existing communal tension, the turning of secular schoolmasters into preachers of religion would be a great mistake and they could not reconcile themselves to the expenditure of the public funds for subsidising religion teaching in any form or shape. They, however, with great reluctance and considerable misgivings gave their provisional consent,—they repeatedly stated and take this opportunity of repeating once again that their consent to the compromise regarding religious instruction within school hours is subject to the condition that religious instructions should only be permitted in school hours in mixed schools when the Islamia schools have been abolished. For so long as such schools are permitted to exist they must continue subject to the condition laid down in Sir James (now Lord) Meston's resolution on the Report of the Piggot Committee.

18. As regards (a) and (b) they were unanimously accepted. But the majority of the committee would not agree to the proposals put forward by the four Muhammadan members of the committee for fixing the proportion of Muhammadan teachers in mixed schools. The majority was of opinion that the proposal was unsound in principle, that it has not been proved that local boards were opposed to the employment of Muhammadans as school masters. Secondly, in case the

principle of fixing the proportion is accepted they could not agree to any proportion other than on the basis of population being laid down for the teachers of the various communities. Nor, in their opinion, would it be fair to fix the proportion of teachers only, when in other departments of Government service a larger proportion of Muhammadans were being employed—far larger than could be justified on grounds of equity and fairness. But the overriding consideration that weighed with them in turning down this proposal was, that in the field of education it is the personality, and not the communal label of a teacher that should count. The experience of appointing only Muhammadans as teachers in Islamia schools has not been so satisfactory as to justify the extension of this vicious principle to the mixed schools. Enquiry also showed that the charges of apathy towards or unsympathetic treatment of Muslim boys by non-Muslim teachers in mixed schools were purely imaginary. Muhammadan witnesses, when cross-examined before the committee could not substantiate such allegations. We found that the less a witness knew about the actual working of the district board and its educational system the more confident he felt in making unfounded charges against the non-Muslim teachers. Similarly, we found another allegation to be equally baseless, viz., that the non-Muslim teachers are averse to encouraging Muslim boys to join vernacular middle schools. The committee has been supplied with the figures relating to the enrolment of Muslim and non-Muslim boys in the vernacular middle schools in the Allahabad division from which we learn that, although the Muslim population in the rural area of the division is only 8·4 per cent. of the total male population, the proportion of Muslim boys to the total number of boys in such schools is over 14 per cent. or 67 per cent. over their population basis. And yet so great is the communal excitement that even responsible persons can make such reckless charges in all seriousness.

19. Some of the concrete proposals put forward by Dr. Zia-ud-din Ahmad Sahib for fixing the proportion of teachers show the spirit in which the discussion on this point was raised in the committee. He started with suggesting that the proportions of Muslim teachers in municipal and district board schools should be fixed at 40 and 35 per cent., respectively. Then he came down to 35 and 30, which were again reduced to 30 and 25. And as the majority in the committee could not agree to agree to this the four Muhammadan members on the committee would agree to no compromise regarding the abolition of Islamia schools. They wanted a *quid pro quo* for their consent to the abolition of the institutions which were admittedly inflicting a great wrong on the present generation of the Muhammadan boys.

20. The problem of maktabas, pathshalas and other aided primary schools deserves to be considered as a whole. At the present time no consistent policy is being pursued, with the result that more often than not they are utilized not so much for the provision of educational facilities as for giving a subsistence allowance to some "toothless" friends of certain influential members of the board or local magnates. Instruction imparted in such institutions is merely nominal, and the average enrolment practically fictitious. The expectation that aided institutions would serve the purpose of attracting more money for purposes of education from liberal-minded private individuals of the

locality has not been fulfilled. With a view, therefore, to putting an end to this state of affairs and to making such institutions more efficient and less wasteful, the committee has laid down certain conditions to regulate the grant of aid by local boards to such schools. In this connexion we would further suggest that it should be made a condition that no school will be entitled to take any grant-in-aid if it has got another school managed or aided by a local board within a radius of one mile. It is nothing but pure waste to have more than one school in a village while hundreds of other villages have to go without schools. For instance, in a district like Allahabad there are villages, each of which has got a mixed, a depressed class, a night, and an aided Muslim school. The number of villages which have got one or more schools is not more than 350 out of a total number of 3,500 villages, of which 750 have got a population of 500 and over; but so uneconomical is the existing arrangement that 720 schools are located in less than 350 villages. In the interest, therefore, of the wider diffusion of the elementary education and bearing in mind the paucity of funds available for this object it is absolutely necessary to put an end to this policy.

21. In regard to the continuance of the special communal inspecting agencies, we should like to place on record our hearty agreement with the views expressed in the joint note of the President and Mr. Said-ud-din Khan Sahib. They are not only useless, but are a fruitful source of inter-departmental squabbles. A demand was put forward by the representatives of the high class Hindus and the depressed classes that the special inspecting agencies on the lines of those provided for Muslim institutions should be created for the inspection of special schools meant for the boys belonging to these communities. We have deliberately refrained from lending our support to this proposal on the sole ground that these special agencies are purely wasteful. The economy committee appointed by the Local Government came to a unanimous conclusion that they should be abolished. The majority of our committee has come to the same conclusion. We should point out that in case the Government does not accept our recommendation on the point they would soon be forced to set up special inspecting agencies for the high caste and depressed class Hindu institutions. Because if the Government think that the special inspecting agency is necessary for the encouragement of education among Muslim boys they cannot, with any show of reason deny similar help to those who are admittedly backward in education.

NANAK CHAND.

MASHAL SINGH.

SUKHDEO TIVARY.

SEORAJ SINGH.

VENKATESH NARAYAN TIVARY.

*Number of boys in Primary Schools during the years 1916, 1917,
1919, 1922 and 1925.*

| Years. | Hindus. | | | Muham- madans. | Others. | Remarks. |
|---------------|----------------|-----------------------|---------|-------------------|---------|---|
| | High class. | Depressed classes. | Total. | | | |
| 1915-16 | .. | .. | 496,041 | 80,900 | 2,430 | (a) As separate figures of depressed class boys are not available the total of Hindu boys has been given. |
| 1916-17 | 520,456 | 16,677 | 537,133 | 92,242 | 4,118 | |
| 1918-19 | 536,908 | 16,756 | 553,664 | 105,644 | 2,266 | |
| 1921-22 | 591,220 | 38,134 | 629,404 | 120,640 | 4,539 | |
| 1924-25 | 705,057 | 72,551 | 777,638 | 156,523 | 4,219 | |

NOTE.—Figures for 1924-25 include in them also the number of boys reading in the primary stage of secondary schools as according to race or creed separate figures of primary schools are not available in the annual returns.

*Schedule of papers circulated to Members of the Advisory Board of the
Imperial Council of Agricultural Research for its meeting held at New
Delhi on the 12th, 13th, 14th, 15th and 16th December, 1931.*

Notes on subjects 1 to 18 and 20 to 35 of Agenda.

AGENDA FOR THE MEETING OF THE ADVISORY BOARD OF THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH TO BE HELD AT NEW DELHI FROM 12TH TO 16TH JANUARY 1931.

1. Decisions of the Governing Body on the recommendations of the Advisory Board in June 1930.
2. Expansion of Pusa as an educational centre.
3. Establishment of an enlarged Animal Nutrition Institute at Dehra Dun.
4. Rice Research :—
 - (a) Proposal for the establishment of a research station in the United Provinces.
 - (b) Rice physiology scheme prepared by Professor R. H. Dastur, Professor of Botany, Royal Institute of Science, Bombay.
5. Necessity for a Central Institute for Education and Research in Dairying in India.
6. Proceedings of the third meeting of the Sugar Committee held in August 1930.
7. Establishment of a sugarcane seedling testing station in Bengal.
8. Scheme for an economic enquiry into the cost of sugarcane production in the United Provinces, North Bihar, Bombay and the Punjab.
9. Scheme for a sugarcane research station in the Bombay Deccan.
10. Appointment of Veterinary Research Officers in the Provinces :—
 - (a) Scheme for research into the protection of buffaloes and cattle from Haemorrhagic Septicæmia by the Bacteriophage Method in Bengal.
 - (b) Application for a recurring lump sum grant for three years to cover the pay of a research officer and equipment to investigate the causes of contagious diseases in animals in the Central Provinces.
11. Proposals for (a) Investigations on virus diseases of plants, and (b) physiologic forms of wheat rust in Bombay.
12. Application from Dr. S. S. Bhatnagar for a grant of Rs. 3,000 a year, for two years, for research on the effect of different Ions on plant growth.
13. Application from Dr. S. S. Bhatnagar for a grant of Rs. 4,150 a year, for two years, for investigations on the relation between the physico-chemical properties and fertility of soils.
14. Scheme for the appointment of a Physical Assistant on the staff of the Agricultural Chemist, Bengal.
15. Application for a grant for experiments on manuring and marketing new types of barley.
16. (a) Establishment of Nutrition research sections in major provinces to work in collaboration with the proposed Nutrition Institute at Dehra Dun.
- (b) Appointment of a Physiological Chemist to study Animal Nutrition problems at Dacca.

17. Application from Dr. H. C. Chaudhuri for a grant of Rs. 12,600 spread over three years for investigation of the "wither tip" of citrus trees.

18. Proposals for the establishment of a research station at Shillong for the development of Bee-keeping in India.

19.—Omitted.

20. Revised scheme of research in fruit growing in Madras.

21. Application from Dr. A. E. Slater, Mission Poultry Farm, Etah, for a grant for 5 years for breeding experiments in connection with the improvement of goats.

22. Production of agricultural cinema films.

23. Testing of Indian agricultural products in England.

24. Application from the Government of Madras for a grant for research work on potatoes.

25. Participation of India in the International Dairy Congress, Copenhagen, 1931.

26. Representation from Kirlokar Bros., in regard to the rates of railway freight charged on agricultural implements.

27. Assistance to be given by the Indian Railway Central Publicity Bureau to promoting agricultural and veterinary development.

28. Dry-farming research station for the Bombay Deccan.

29. Research on the water requirements of crops.

30. Proceedings of the first meeting of the Fertilisers Committee held in June 1930.

31. Preliminary report on the calorific value of some Indian woods.

32. Arrangements for the examination by specialists of papers for publication in the new Journals and the preparation of a list of referees.

33. World's Grain Exhibition and Conference, Canada, 1932.

34. Revision of the Publications "Dictionary of the Economic Products of India" and "The Commercial Products of India".

35. Scheme for research on Plant Physiology at the Hindu University, Benares.

PROCEEDINGS OF THE MEETING OF THE ADVISORY BOARD
OF THE IMPERIAL COUNCIL OF AGRICULTURAL RE-
SEARCH HELD AT NEW DELHI ON MONDAY, THE 12TH
JANUARY 1931.

The following were present :—

1. Diwan Bahadur Sir T. VJAYARAGHAVACHARYA, *Chairman*.
2. Major F. H. BUDDEN (attended in the afternoon).
3. Mr. B. C. BURT.
4. Mr. P. H. CARPENTER.
5. Mr. G. K. DEVADHAR.
6. Mr. R. S. FINLOW.
7. Dr. N. N. GANGULI.
8. Mr. K. HEWLETT.
9. Mr. G. R. HILSON.
10. Dr. L. K. HYDER (attended in the afternoon).
11. Mr. NIZAMUDDIN HYDER.
12. Dr. B. A. KEEN.
13. Mr. P. J. KERR.
14. Mr. T. F. MAGN.
15. Mr. D. MILNE.
16. Colonel A. OLVER.
17. Mr. F. J. PLYMEN.
18. Mr. T. F. QUIRKE.
19. Mr. W. ROBERTSON-BROWN.
20. Mr. P. T. SAUNDERS.
21. Mr. R. L. SETHI.
22. Major R. I. STIRLING.
23. Mr. W. TAYLOR.

Mr. M. S. A. HYDARI, *Secretary*.

The following attended as visitors :—

1. Dr. S. P. AGHARKAR.
2. Mr. B. A. COLLINS (not present in the afternoon).
3. Dr. W. H. HARRISON.
4. Dr. W. McRAE.
5. Mr. W. SMITH.
6. Mr. F. J. WARTH.

2 The meeting lasted from 11 A.M. till 5 P.M. with an interval for
lunch from 1-30 P.M. to 3 P.M.

3. The Chairman, after welcoming members and visitors opened the discussion by referring to the note (Appendix I) of the decisions of the Governing Body made on the recommendation of the Advisory Board at its meeting in June 1930 which formed subject 1 of the agenda.

In regard to sub-paragraph 10 of the note (Appendix I) the Chairman explained that Sir Guy Marshall, and Professor Uvarov, with whom he had discussed the Empire Scheme of Locust Research, had informed him that the Empire Locust Research Scheme was due to start early in January. He had however subsequent information that owing to the fact that King Ibn Saud had vetoed the visit of any investigation party in Arabia, it would have to be confined to countries further west than Arabia. As it was with locust investigation in Arabia with which India was principally concerned the locust research now being conducted under aegis of the Council would be separate from that carried on the African side of the Red Sea. There was, therefore, nothing for India to do but follow the course she was doing.

In regard to sub-paragraph 15 (Appendix I) the Chairman announced that while in London he had conferred with the Empire Marketing Board. The latter considered that expenditure on quarters should be met by the Provincial Governments concerned. With this exception the Board were sympathetic towards sharing the cost of the rice schemes. There was, however, another difficulty which was that the British Chancellor of Exchequer had warned the Board not to undertake new liabilities till the Chancellor had decided what grant to give them for the ensuing year. The Board could, therefore, take no final decision in the matter which was therefore still open.

4. *Expansion of Pusa as an educational centre (subject No. 2 of the agenda) (Appendix II).*—Dr. Keen in introducing the subject said that he would prefer the Directors of Agriculture present at the meeting to express their views first. He desired, however, to make a few preliminary remarks. The questions with which they were concerned were the provision of facilities at Pusa for the training of post graduate students and secondly for what might be called more formal courses of instruction for men of the Deputy Director of Agriculture type. Success in regard to both these points depended, in his opinion, upon the success which Pusa achieved as a centre of fundamental research. He was satisfied that this could be achieved in a relatively short period of time provided the necessary funds were available. Only second to the provision of adequate funds was the need for the presence of keen post-graduate students at Pusa if it was to become a really first class research institution. Post graduate students were the life blood of research institutions. He considered that though research work of a high quality was being done in the provinces there was need for a central institution which could tackle problems of long range research which were somewhat outside the ambit and the resources of Provincial Departments. Mr. Devadhar was not sure whether facilities which would be provided at Pusa would be utilised by Provincial Governments who, in his opinion, judging from the letters received from them in reply to the circular letter of the Government of India, No. 1215-Agri., dated the 23/27th July 1929 (Appendix II), did not appear to be very keen on this point. Mr. Burt said that Bombay was alone in saying that it did not require facilities in India outside those which it could provide within the Presidency itself; other local Governments on the contrary were as specific

and encouraging as the Government of India had a right to expect. In this connection Mr. Burt reviewing the history of the proposal to make Pusa an all-India centre for post graduate training in agriculture said that as far back as 1922 a syllabus was framed and definite proposals made to establish Pusa as such, but that just then retrenchment came and the proposal was for the time being shelved. In these circumstances he considered that the guarded replies (Appendix II) of local Governments were natural. Mr. Milne was of opinion that although several Provincial Agricultural Colleges, for example, the Lyallpur College, had very good facilities for training in certain lines, a central institution like Pusa would be able to give training in special directions which Provincial Colleges could not give, but that from the very fact that facilities did exist at the latter the calls on the central institution would be few. He considered that a central institution should carry out fundamental research of an all-India character. He emphasized that research should be the first function of such an institute and training in research work there second. Mr. Plymen stated that all the provinces in India were re-organising their agricultural services. They were now recruiting for a Superior Provincial Agricultural Service which had replaced the Indian Agricultural Service. What they in the Central Provinces had laid down as a condition for entry into this Superior Service was training in agricultural science *plus* a two years training in a recognised institution. The question was as to the institution which would be so recognised. He considered that Pusa would be one such institution. He was not one of those who attached prime importance to the possession of local experience. In the Agricultural Department he wanted men with an open mind and he was strongly in favour of future recruits possessing wider experience than what a training in a Provincial Agricultural College would give. For this reason he was in favour of sending likely recruits to Pusa or abroad. He did not care whether lectures were or were not given at Pusa but what he did want Pusa to do was to give training in research work. Mr. Milne was in entire agreement with this. Mr. Finlow said that he would emphasize the point that the first function of a central Research Institute was the conduct of fundamental research of the highest standard and that post graduate training was ancillary to this. Whether an institution did or did not attract post graduate students today depended upon the calibre of research conducted there and he would therefore put forward as a first desideratum that Pusa should be a first class centre of research. Mr. Hilson while agreeing generally with Mr. Finlow said that there were certain advantages in sending a student abroad as against sending him to Pusa. Conditions at Pusa were somewhat similar to those in the rest of India and if a wider outlook, the necessity for which had been stressed by previous speakers, was desired it might be an advantage to send the students now and then abroad. There conditions were so wholly dissimilar to those in India that the mere shock of changed conditions and wider opportunities would help the student to acquire a wider outlook. Mr. Main said that he could not support a proposal to make Pusa the only institution in India at which post graduate instruction could be given in agriculture. If it was desired that it should be an institution where such instruction was given without excluding other possible institutions he did not mind. He reminded the Board that an institution which set out to give post graduate training must first make its reputation. He considered that while Pusa could give instruction of the highest

standard in certain branches of agriculture it could not give it in all, for example, in regard to cotton. He therefore thought that it should confine itself to two or three special subjects. Mr. Sethi was strongly in favour of Pusa giving post graduate instruction for which he considered it was better fitted than any Provincial Agricultural College. Mr. Collins was of the opinion that in view of the recommendations of the Royal Commission on Agriculture and of the establishment of the Imperial Council of Agricultural Research it was only logical that the Government of India should do its best to develop one or more Agricultural Research Institutions of the highest type. There should be one institute at least in India which would confine itself to fundamental research. If it did Provinces and Indian States would take the fullest advantage of it though naturally training abroad would also have to be occasionally resorted to. There was at the present time a feeling among students that if one obtained a foreign degree he stood a better chance of getting a post in the Agricultural Department. There was no reason why with a first class institution in India capable of giving instruction of the highest standard this feeling in regard to the superiority of foreign degrees should not disappear. Mr. Robertson-Brown said that the Centrally Administered Areas had only Pusa to look up to in regard to the training of their agricultural officers. Dr. Agharkar said that provinces were at the present moment in varying stages of development. Some Provincial Colleges like Lyallpur gave agricultural training up to the Master's degree; such would probably not have much need of Pusa. In others which were not so advanced the attraction towards Pusa would be stronger. He wished to point out further that Pusa was not very well situated for all kinds of research. He instanced the utility of the Kaiser Wilhelm institutions in Germany; these were a number of institutions of different types each specialising in certain branches of science. Pusa in his opinion should be developed on such lines and could be made pre-eminent in those lines for which it was pre-eminently suited. Moreover, Pusa could only justify itself if it brought itself in closer contact with Indian Universities, for instance, if the post graduate training given there was of a standard which Universities would accept for the grant of Doctorates in Agriculture. If this result were achieved it would be able to attract students even though no promise of employment went with a successful conclusion of their course of training. In short, Pusa should be fitted in with other educational institutions in India. Mr. Carpenter said that as he saw it the position was this: Pusa was a research station for fundamental research. Provincial Institutions like his own, viz., the research station of the Indian Tea Association at Toeklei were stations for the conduct of applied research. He was at one with Mr. Finlow and others in insisting that the most important function of Pusa was that of a research station for fundamental research. Its expansion as an educational centre was secondary to this. He wanted to know what was meant by expansion. Was expansion of staff or expansion of space for students meant? If that was so the Board should have a syllabus and a scheme of work for post graduate training before it could discuss the question of expansion which might lead to an application for a grant from the Council. In his opinion if Pusa created a proper research atmosphere then instead of students from India having to go abroad it would probably be the case of students from abroad coming to India. He also felt that Pusa ought to specialise in certain subjects. That was his reason for enquiring as to the lines on which expansion was contemplated. He quite agreed that it was impos-

sible for local Governments to say from the start how many students they would send. That naturally depended on various factors which could not be foretold at present, one of which was as to how Pusa would shape. He also was somewhat doubtful whether in being asked to assent to the proposal under discussion the Advisory Board was being asked to recommend expenditure which would fall on the funds of the Council. If so, he thought that the Board should have details. In regard to the meeting of 1922 referred to by Mr. Burt he had looked at the minutes (Appendix III) but he felt that those attending the meeting did not know what they wanted. It seemed to him that the conclusions of that meeting were really formulated by the President without any reference to what the other members of the meeting had said. Dr. Ganguli agreed with Messrs. Agbarkar and Carpenter in holding that Pusa should be developed as a centre of fundamental research but he felt that to achieve that end it would have to take in a number of post-graduate students which, quoting Dr. Keen, he said were the life blood of any research institution. At this stage Mr. Devadhar intervened and moved the following resolution which was seconded by Mr. Main.

“ In view of the developments made by the various Provincial Governments in the direction of agricultural education and agricultural research, this Board is of opinion that the question be postponed and referred to a sub-committee to estimate the cost and work out a detailed scheme.”

Thereupon a second resolution was moved by Mr. Finlow and seconded by Mr. Carpenter.

“ That Pusa should continue to be developed actively and to the greatest possible extent as an Institute for fundamental research. If facilities for post-graduate training analogous to those provided at present, are then offered, it will attract research students in proportion to its success as a research centre.”

Before putting the two resolutions to the vote the Chairman asked Dr. Keen whether he would like to say anything in the light of the previous discussion. Dr. Keen said that on the whole he considered that the provincial directors were distinctly sympathetic to having a centre in this country where fundamental research was carried on. He confessed that had he been a Director of Agriculture he would have spoken very much in the same vein as the Directors of Agriculture present at the meeting had spoken, namely, that as to whether they were or were not prepared to send their men to an institution depended upon the institution itself. What was required was the removal of difficulties in the way of further advance and the increase of facilities for such advance. In regard to the suggestion made by Bombay that if need be they could always send students for training abroad he would like to point out that it was getting increasingly difficult to obtain admission for students in foreign institutions of the required standard. He was all for having in one's own country an alternative institution. He was in complete sympathy with Dr. Agbarkar's view that Pusa should be brought into the closest possible touch with Indian Universities through, for example, the post graduate course of training which would be given there being recognised as sufficient for a Doctorate of Agriculture in an Indian University. Finally, he would lay down no rigid rules or regulations for the conduct of post graduate training at Pusa. The whole essence of such training was that it should be fluid

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and flexible to suit the circumstances of each case. The less rules there were the better. It was only thus that the training could be adapted to the needs of each particular student.

Mr. Devadhar's resolution noted above was then put to the vote and lost. Thereupon Mr. Finlow's resolution which was seconded by Mr. Carpenter and which ran as follows was put to the vote and carried unanimously :—

“ That Pusa should continue to be developed actively and to the greatest possible extent as an Institute for fundamental research. If facilities for post-graduate training analogous to those provided at present are then offered, it will attract research students in proportion to its success as a research centre.”

5. The Chairman considered that the general discussion which had taken place so far would be of the greatest assistance to the Government of India but he felt that the stage had now been reached at which the Board should give definite answers to the four questions asked in the letter of the Government of India, No. 1826-Agri., dated the 6th September 1930. (Appendix II.)

Question 1.—Is definite post graduate instruction, as distinct from facilities for research work, desired in all the subjects dealt with at the Pusa Research Institute ?

The Board agreed to a resolution moved by Mr. Burt and seconded by Mr. Hilson that :—

“ The provision of facilities for research work and for acquiring a knowledge of modern research methods and technique is all important : this involves a certain amount of definite but not formal instruction.”

Before the discussion on this point was closed Mr. Burt said that he wished to draw attention to a point made on a previous occasion by the Imperial Entomologist as to the need for a more formal training in Entomology for University graduates taking up Entomology. This was probably necessary in view of the fact that there were not adequate facilities for Entomological training in Indian Universities. Dr. Keen replied that it was to provide for such cases amongst others that he had pleaded that the regulations for post graduate training at Pusa should be as fluid and flexible as possible. He would arrange for a formal course in respect of particular students, if necessary, but would prefer not to be bound down by regulations or resolutions. It was quite likely that post-graduate workers in entomology or mycology or physiology would have to spend a longer time than those taking at other branches of science but it was the function of an institution which gave post-graduate training to adapt the latter to the varied needs of various students.

Question 2.—Is there a need for a special post-graduate course at Pusa designed for future Assistant and Deputy Directors of Agriculture, as distinct from the specialist courses in special branches of agricultural science ? If so, should the special course for Assistant and Deputy Directors be largely in the nature of a refresher course in science and in the technique and interpretation of field experiments designed for men

whose initial training has been largely in agricultural colleges and who have had considerable subsequent experience in practical agriculture ?

There was general agreement that there was need for such a course and also that it should be an original course. Messrs. Main and Burt, while agreeing to the latter, pointed out that in some cases it would be desirable to give a refresher course in the various branches of agricultural science ; in order to assist students coming from a Provincial Department of Agriculture who had left the University or the Agricultural College several years before and were not acquainted with the recent advances in pure science.

Question 3.—What will be the general standard of scientific and technical knowledge which candidates recommended by Provincial Departments of Agriculture will have attained prior to entering on their post-graduate course ?

Mr. Milne said that in the Punjab Department of Agriculture while they did recruit men with a purely scientific training for special appointments the majority of men selected for his Department were those who were B.Sc.'s in Agriculture. Mr. Plymen was against prescribing any scientific qualifications in regard to men sent from a Provincial Department of Agriculture to Pusa. He would leave the recommendation to the discretion of the Director of Agriculture. Mr. Finlow said that he would make a difference as between a post-graduate course for purely scientific men and the special course for Assistant and Deputy Directors of Agriculture. For the former he would insist on very high scientific qualifications ; for the latter lower scientific qualifications might suffice. Mr. Main considered that they should not be satisfied merely with a degree, however excellent that may be, but should also insist that the men sent for post-graduate training had previous experience. Mr. Hilson agreed with Mr. Main. Dr. Agharkar said that the admission of students should not be dependent upon the recommendations of Directors of Agriculture. It was for Pusa like other research institutions in the world to lay down the minimum qualifications which it would require for entry to a post-graduate course there. If a student had those he would be eligible for admission. As to what such minimum qualifications should be Dr. Agharkar thought that this question should be investigated by a small committee. Mr. Carpenter agreed with Dr. Agharkar. Generally speaking he would put down the minimum qualifications as at least an M. Sc. degree. On the question of qualifications Mr. Burt proposed :—

That for University students seeking admission to the post-graduate course it should be insisted that ordinarily they should have the highest degree in science, short of a Doctor's degree awarded by the University from which they came and that for agricultural graduates a first class or a high position in the College gradation list should be demanded.

This proposal was accepted.

Question 4.—The class of students which should be admitted to the Pusa Research Institute for post-graduate training ?

It was generally agreed that entry to the post-graduate course should not be confined to men already in Government service but should be open to private students. That in each province there should be a selection committee on which due representation should be given to Univer-

ties and that the recommendations of such selection committees should go before a selection committee at Pusa. It was generally agreed that as pointed out by Dr. Keen an institute should have the final voice in the selection of students which it admitted. It was also agreed that the formation of such provincial selection committees should not debar the authorities at Pusa from admitting a student who had not gone before a provincial selection committee but who in the former's opinion was suitable for taking up the post-graduate course. In regard to qualifications it was agreed that ordinarily candidates should not be selected unless they had the highest degree in science short of a Doctor's degree which the University from which they came awarded.

Mr. Devadhar inquired if the course to be framed would be submitted to the Advisory Board of this Council for their criticism and added that in his opinion the training to be provided for the Post-Graduate Course laid down for the Assistant and Deputy Directors of Agriculture of the various provinces should contain among others a paper on :—

- (a) Agricultural Economics.
- (b) Agricultural Co-operation.
- (c) Popular methods of propaganda so as to make these officers the best links between the experts on the one hand and the cultivators on the other.

6. The Chairman then referred the Board to paragraph 6 of the Government of India's letter referred to above drawing the attention of the Imperial Council of Agricultural Research to the recommendations of the Royal Commission on Agriculture in connection with the formulation of a scheme for research scholarships and also for scholarships for post-graduate training for district work. Mr. Burt in opening the discussion referred to the proceedings of the Conference of Ministers of Agriculture held in 1928 which expressed itself to be against any scheme of pooling provincial and central resources towards the financing of a general scholarship scheme. The Board must therefore proceed on the understanding that money for any scheme of scholarships recommended by the latter would have to be found from the funds of the Research Council. Continuing Mr. Burt said that he could think of two kinds of scholarships for work in India and a third for work abroad, viz.,

- (1) To enable suitable graduates to take a post-graduate course at Pusa. This would be a very limited number.
- (2) Continuation scholarships, rather on the lines of research fellowships which would assist men of proved capacity as research workers to continue research work at some established institution who but for such monetary assistance would not be able to do so.
- (3) If scholarships for study abroad were given by the Council at all they should be awarded to really distinguished men from India who could do research of a high order abroad.

A good many members of the Board referred to the difficulty in providing employment for scholars after the termination of their scholarships. Professor Ganguli explained the system of scholarships awarded by the Ministry of Agriculture in England, funds being made available from the Development Commission and said that they should not be obsessed too much with the problem of appointments.

Scholarships should be given for definite problems related to some scheme of research of which he has a few examples. Mr. Carpenter threw out the suggestion that they might follow the example of the Colonial Office in Great Britain. That Department gave scholarships to particularly brilliant students to do a certain line of research and at the same time keep them going till a suitable post had been found for them. Colonel Olver said that on the animal husbandry side what they lacked was suitable men; scholarships might provide a reservoir of such men from whom a selection could be made. Dr. Keen said that while Pusa was concerned equally with other institutions in India in such a scheme for scholarships he would appeal that the question be looked at from a point of view other than the purely commercial. The object of such scholarships should not, in his opinion, be merely with a view to provide the scholar at the end of his time with a job, but rather the promotion of research. He would ask for a little courage both on the part of the Imperial Council as well as of the scholar. It was quite likely that a particular piece of research might result in the creation of lucrative appointments. For example, the problem of cold storage to which Dr. Ganguli made a reference might conceivably after due investigation result in producing new openings for technical men. The Chairman said that no reply was due to the Government of India on this subject; the latter had merely drawn the Board's attention to it with a view to such action as the Imperial Council might care to take on the recommendations of the Royal Commission. The discussion had been a very useful one and he personally shared Dr. Keen's views on the subject. For the present, however, and until a definite scheme had been worked out the Board might take note of the subject and pass on to the consideration of the next one.

7. *Establishment of an enlarged Animal Nutrition Institute at Dehra Dun, (subject No. 3 of the agenda). (Appendix IV.)*—After Mr. Warth and Colonel Olver had briefly introduced the subject Professor Ganguli enquired whether the Council was being asked to find any money towards this scheme. He was informed that at this stage no demand for a grant was being made but that the views only of the Advisory Board had been asked for as to the utility or otherwise of this scheme. Professor Ganguli then proceeded to ask why Dehra Dun had been chosen as the site for the proposed institute; whether the fact that buildings and land were available at Dehra Dun rather than the suitability of Dehra Dun for the location of such an institute was not the prime cause of Dehra Dun being selected. Why, for example, was it proposed to shift from Bangalore? At this stage the Chairman adjourned the meeting till 11 A.M. on the 13th.

M. S. A. HYDARI,
Secretary.

The 12th January 1931.

PROCEEDINGS OF THE MEETING OF THE ADVISORY BOARD
OF THE IMPERIAL COUNCIL OF AGRICULTURAL RE-
SEARCH HELD AT NEW DELHI ON TUESDAY, THE 13TH
JANUARY 1931.

The following were present :—

1. Diwan Bahadur Sir T. VIJAYARAGHAVACHARYA, *Chairman*.
2. Mr. B. C. BURT.
3. Mr. P. H. CARPENTER.
4. Mr. G. K. DEVADHAR.
5. Mr. R. S. FINLOW.
6. Dr. N. N. GANGULI.
7. Mr. K. HEWLETT.
8. Mr. G. R. HUNSON.
9. Dr. L. K. HYDER.
10. Mr. NIZAMUDDIN HYDER.
11. Dr. B. A. KEEN.
12. Mr. P. J. KERR.
13. Mr. T. F. MAIN.
14. Mr. D. MILNE.
15. Colonel A. OLVER.
16. Mr. F. J. PLYMEN.
17. Mr. T. F. QUIRKE.
18. Mr. W. ROBERTSON-BROWN.
19. Mr. P. T. SAUNDERS.
20. Mr. R. L. SETHI.
21. Major R. F. STIRLING.
22. Mr. W. TAYLOR.

Mr. M. S. A. HYDARI, *Secretary*.

The following attended as visitors :—

1. Dr. S. P. AGHARKAR.
2. Mr. B. A. COLLINS.
3. Dr. W. H. HARRISON.
4. Dr. W. McRAE.
5. Mr. W. SMITH.
6. Mr. F. J. WARTH.

2. The meeting lasted from 11 A.M. till 5 P.M. with an interval for lunch from 1-15 P.M. to 3 P.M.

3. Subject No. 3 (Appendix IV) continued. Colonel Olver replying to Professor Ganguli said that it was not because suitable buildings were

available at Dehra Dun that the latter place was selected ; when it was found that there was no possibility of expansion at Bangalore a scheme for the location of the Institute at Dehra Dun had been drawn up which provided for buildings and was estimated to cost about 8 lakhs. It was only recently that buildings which were very well suited for a Nutrition Institute had become available owing to the closing of the X-Ray Institute. He thought that the essentials for a research institution of the kind proposed were, first that it should be reasonably easy of access ; secondly, that it must be healthy for stock ; and lastly, that it should be suitable for work all the year round. Dehra Dun satisfied all these conditions and had moreover other research institutions located there like the Forest Research Institute. This would be an added advantage. It was desirable that scientific men should have opportunities of meeting together and comparing notes. The Forest Research Institute especially could help the Nutrition Institute greatly in questions relating to the use of forest products as fodder. Further, the use of rice straw as fodder which was an important question in India could be very well investigated at Dehra Dun where very good rice land was available. Izatnagar, Hissar and Karnal were within easy reach so that there would be no difficulty in keeping the Institute supplied with stock. Animal health was another very important consideration. The land which he had selected at Dehra Dun was well drained and his exhaustive enquiries in regard to the condition of stock in the Dehra Dun area had convinced him that it was a very healthy locality for stock. In this connection he drew attention to the fact that the Body Guard kept their horses at Dehra Dun for long periods of the year. He had originally selected a piece of land which would have had to be purchased but on a second visit he had come across a piece of Government land about 325 acres in extent adjoining the X-Ray Research Institute which would serve the purpose very well. Dehra Dun had been selected as a suitable site for the Animal Nutrition Institute by Dr. Clouston, Dr. McRae, Mr. Burt and Mr. Smith before he himself arrived and after enquiry he came to the same conclusion. Dr. Hyder said that he strongly supported the proposal. In his opinion two-fifths of the misery in India arises through the loss of cattle. There was however one matter to which he should like to draw attention. He did not approve of the proposed Animal Nutrition Institute being under any other authority such as Pusa or Muktesar. It was impossible to direct an institution from a distance. Such an arrangement was merely bureaucratic. What he urged was that if as he hoped an Animal Nutrition Institute was started at Dehra Dun it would be given an independent status and the small allowance asked for the Director would not be grudged. Mr. Sethi said that experiments should be conducted in the plains and that research stations should be in the plains. Dehra Dun was exceptional and not typical of the rest of India. Further he thought that an Animal Nutrition Institute should be close to a veterinary college. Mr. Warth replying to the criticism that conditions at Dehra Dun in the matter of fodder were not typical said that even at Bangalore they had tested materials coming from as far away as northern Punjab. Mr. Kerr said that in Bengal their problem was the utilisation of numbers of indigenous plants as fodder. Bengal was going to have a bio-chemist who would work in collaboration with the proposed Central Institute which he thought was absolutely necessary. There need be, in his opinion, no fear that there would be difficulty in applying the results obtained at the Central Institute in the provinces with their varying climatic and other

conditions ; for it would be the duty of provincial stations to adapt results obtained at the Central Institute to their own needs. Mr. Quirke said that Dehra Dun would be very suitable for the Punjab where they were hoping to start a sub-station which would work in collaboration with the Nutrition Institute. Mr. Saunders said that in Madras the ignorance about cattle food was abysmal. People fed their cattle with the same kind of stuff as their fathers and grandfathers had fed them with before them. In Madras there was the practice of cattle migrating in the summer in search of food. This was uneconomical and was a potent cause of the spread of disease. If therefore as a result of research what was found in a place could be utilised as fodder for the cattle of the place it would be a great saving economically and in other respects. Mr. Hewlett was against the Animal Nutrition Institute being near a veterinary college as the latter was situated in towns. Replying to Mr. Devadhar Colonel Oliver informed him that it was not proposed to shift the Dairy Institute from Bangalore ; there was no particular reason why dairying and animal nutrition should go together. Major Stirling also supported the scheme. Professor Ganguli was in entire agreement as to the necessity for an Animal Nutrition Research Institute. The only question about which he was not satisfied was its proposed location at Dehra Dun. When the Nutrition Section was started at Dehra Dun the then experts probably considered it quite suitable. So did experts consider Burma as suitable for cinchona plantation though it was found later that cinchona would not grow there. When the Royal Commission on Agriculture visited Bangalore they felt that there was not sufficient space there but the suitability of the place itself was never questioned. He was of opinion that the question of location of the proposed Institute should be dealt with by a special committee of the Council. Mr. Warth replying to Professor Ganguli said that Bangalore was not the choice of any expert. It was chosen for him. After two years he knew that Bangalore would not do because of lack of room for expansion. He would point out that hardly any money had been spent on buildings and what few buildings there were for the Animal Nutrition Section would be very welcome to the Imperial Dairy Expert. Mr. Smith, whose section also was in great need of expansion. He confirmed what Colonel Oliver had said that Dehra Dun was not selected because the buildings were there but long before they had any knowledge that buildings would become available. His first plans had provided for erection of new buildings. Professor Agharkar did not agree that the existence of educational and research institutions at Dehra Dun was an argument in favour of locating the Animal Nutrition Institute also there ; for, the kind of research conducted at the former bore no relation to the research which would be done at the latter. Animal nutrition work was akin to the work on human nutrition which was being done by Colonel McCarrison at Coonoor. Mr. Carpenter said that he was at first somewhat bothered about the wastage of buildings at Bangalore but in view of Mr. Warth's explanation that they would be fully utilised by the Dairying Section this obstacle no longer existed. He confirmed what Mr. Warth had stated that Bangalore was never chosen as being the best centre in India. It was chosen purely as a matter of convenience. Then as pointed out by Colonel Oliver Dehra Dun had been selected not by one expert but by several. He therefore would support the proposal to have the Institute at Dehra Dun. He also supported Dr. Hyder's point that the Institute should have an independent status.

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In reply to the Chairman Mr. Smith said that there was no possibility of acquiring more land in Bangalore ; land round about the Dairy Research Institute in which the Animal Nutrition section was also located was Mysore territory ; it was cultivated and held under a tenure which precluded its acquisition by the Mysore Government for the Dairy Research Institute without the consent of the owners of the land. This was not forthcoming. He needed all the space available for his own work of dairy research whereas now he had to share it with the nutrition section. In the result it detracted from the work of both. Cattle which had been made the subject of fodder experiments could not be expected to yield milk to their full capacity. Further the limited land available for growing crops was not sufficient to allow for the needs of the Nutrition Section for which it was necessary to grow special crops. He would be fully able to utilise the space left vacant by the transfer of the Nutrition Section to the betterment of the work of dairy research at Bangalore. He could not conceive of a better place for the location of Nutrition Institute than Dehra Dun. He had examined Belgaum and Jubbulpore but they were not so suitable. Dehra Dun had the great advantage that it grew almost every variety of crop. In the hot weather it was much hotter than Bangalore and in the cold weather it was much colder than Bangalore. In the result both tropical and temperate crops could be grown at Dehra Dun.

The Board agreed to the necessity for the establishment of an enlarged Animal Nutrition Institute in India and for its location at Dehra Dun. The fact was also noted that at present the Council was not committed to the grant of any money.

4. *Subject No. 4—Rice Research.*—(a) Proposal for the establishment of a research station in the United Provinces (Appendix V).—After Mr. Sethi had explained the scheme (Appendix V), Mr. Burt in reply to Professor Ganguli said that the scheme fitted in with the co-ordinated scheme of rice research which had already been approved in principle by the Council. The position in regard to the share of the Empire Marketing Board in schemes of rice research was at present uncertain as had been explained by the Chairman at the meeting of the 12th. Mr. Burt, however, drew attention to the fact that on one point the Empire Marketing Board were quite definite, namely, that they would not share in any expenditure on residential quarters which in the Board's opinion should be borne by each Province. Mr. Burt supported the scheme but not its financial details especially in view of the criticism of the Empire Marketing Board in regard to residential accommodation. He explained that the Board's objection did not extend to all capital expenditure, for example, on laboratories. Mr. Sethi informed Mr. Devadhar that the United Provinces would continue to spend Rs. 30,000 per annum on rice research as they had been doing for the past 4 or 5 years. Messrs. Hilson and Plymen criticised the provision proposed (Appendix V) for the pay of staff, running charges, laboratory, tube well and gas plant as excessive. Professor Agharkar drew attention to the point that no mention had been made of receipts from the land which ought to be considerable. The Chairman considered that to ask the Council to provide for the cost of an Inspection Bungalow (Appendix V) was not right. Dr. Hyder and Mr. Carpenter both urged that the principles governing grants which had been laid down by the Governing Body of the Council should not be departed

from at the request of an applicant. If that were done and the Council on the plea of financial stringency made exceptions the result would be that in course of time the Council would have to do everything and Provincial Governments nothing. Mr. Carpenter also said that looking at the rice schemes so far approved they were only concerned with one side of rice research, namely, the genetic. There were other sides also and he thought that a technical committee should examine the present scheme and pronounce a definite opinion thereon. The Chairman considered that as the scheme under discussion had been subjected to criticism from several points of view it might be examined by the same committee as examined the previous rice research schemes. This would be preferable to referring the scheme back to the local Government and thus delaying a decision thereon. As a few members of the original rice committee were not present at this meeting others were nominated in their place and a sub-committee composed of the following was appointed with instruction to report to the Board before the conclusion of the present meeting :-

1. Mr. B. C. BURT.
2. Mr. P. H. CARPENTER.
3. Mr. R. S. FINLOW.
4. Dr. N. N. GANGULI.
5. Mr. G. R. HILSON.
6. Dr. B. A. KEEN.
7. Mr. T. F. MAIN.
8. Mr. F. J. PLYMEN.
9. Mr. R. L. SETHI.

with the Chairman and Secretary of the Board as *ex-officio* Chairman and Secretary of the sub-committee.

5. *Subject No. 4—Rice Research.*—(b) Rice physiology scheme prepared by Professor R. H. Dastur, Professor of Botany, Royal Institute of Science, Bombay (Appendix VI).—Mr. Main in presenting the scheme said that it was not a departmental scheme but one which had been put forward by the Bombay University in pursuance of the recommendations of the Royal Commission that Universities should be encouraged to collaborate in agricultural research. Mr. Burt said that Professor Dastur was working on a problem which had a definite practical importance, *viz.*, the nutrition of the rice plant. The amount of the grant applied for was reasonable and he supported the scheme as did Professor Ganguli. Mr. Plymen said that during the Science Congress he and others had been very favourably impressed with the work already done by Professor Dastur and he strongly supported the present scheme. Professor Dastur was, however, labouring under one disadvantage in that he had no land for field work but had to grow what he wanted for his experiments in pots or in culture solutions. He thought that facilities should be provided for Professor Dastur for field work. Mr. Main undertook to do so at Karjat where the Bombay Government had a rice station if Professor Dastur applied for assistance. Dr. Agharkar also supported the scheme.

The Board approved the scheme with the rider that Professor Dasiur should be asked to consider the advisability of asking the Bombay Department of Agriculture to grant him facilities at Karjat.

6. *Necessity for a Central Institute for Education and Research in Dairying in India (subject No. 5 of the agenda) (Appendix VII).*—After Mr. Smith and Colonel Olver had introduced the subject by explaining and emphasizing the need for a Central Institute for education and research in dairying in India and therefore for the maintenance and development of the existing Imperial Institute of Dairying at Bangalore, Dr. Agharkar said that a research institute in India should conduct research in those dairy products which were indigenous to this country, for example, sour milk, ghee and butter. Cheese did not form part of the ordinary Indian diet and there was no use in a Dairy Research Institute in India applying itself for example to the problem of cheese manufacture. Therefore while there could be no two opinions about the need for such an Institute as existed at Bangalore he thought it should be emphasized that it should cater for the needs of the people; before undertaking any piece of research it should be ascertained whether that research however valuable it might be as a piece of research work was really suited to the needs of the country and also whether the results therefrom would redound to its economic good. Mr. Devadhar ascribed the lack of an adequate and pure milk supply in India to the lack of education among the milk producers. He commended the statement appearing in the Punjab Government's letter in reply to the circular letter of the Government of India to local Governments on education and research in dairying which ran as follows:—

“ There is reason to believe that a short vernacular course lasting about 6 months in practical dairying would prove more popular than a two-years diploma course. Youths, who have been educated up to the Middle Standard could there be given a useful and practical course in cattle management, feeding, and dairying, and would prove of value to large cattle owners and dairy men ” (Appendix VII).

Professor Ganguli referred to the statement in the letter from the Government of the United Provinces (Appendix VII) in regard to the Allahabad Agricultural Institute which gave dairy instruction of a high standard but which had not for the present been able to affiliate itself to any University and enquired whether the Board could not approach the Allahabad University on behalf of the Institute. Dr. Hyder said that the Board could not interfere in a matter of this kind which was entirely one for the University. Speaking on the main proposition he doubted whether there could be in India a Central Institute for fundamental research in dairying. If not, and he thought there was no scope for it, then the finance of what he would call a dairy factory school did not come within the purview of the Research Council's activities. Mr. Burt said that there was no question of providing any new institute. The institute already existed at Bangalore. In his opinion not only was that doing very valuable work and needed development but in a big country like India he thought there was room for more than one such Central Institution where dairy research could be carried on. He agreed, however, with Dr. Agharkar that such an institute should adapt its research work to Indian conditions. On the other hand there was, for example, in Gujerat an

indigenous dairy industry run more or less on modern lines and which had the same problem to tackle as dairy industries in countries other than India, for example, the economic disposal of skim milk. He suggested that the answer of the Board to the Government of India's letter (Appendix VII) should be that there was great scope for one or two central institutes for education and research in dairying. Mr. Milne referring to Mr. Devadhar's quotation from the letter of the Punjab Government said that the vernacular class recommended therein had already been started in the Punjab and that there were eight students in it. There was, however, in his opinion need for some central institute to tackle the bigger questions like the supply of milk to towns—in short the problems of the dairy factory industry. He as well as Messrs. Warth and Quirke paid tribute to the assistance they had received from the Imperial Dairy Institute, Bangalore, and from Mr. Smith. In Mr. Quirke's opinion the provinces should confine themselves to the elementary forms of dairy training, the higher forms being given by one or more central institutions. At this stage, Mr. Devadhar moved the following resolution :—

“ That having regard to the views expressed by the various Provincial Governments and to the suggestions made by the Government of the Punjab this Board would recommend to the Government of India as a useful preliminary measure in furnishing higher education in dairying to make funds available to local Governments on the basis of equal contribution for the establishment of scholarships for youths particularly of the Gowala class and for the establishment of a small course of six months for the study of subjects dealing with the industry of milk and its development by small men or co-operative societies ”.

Dr. Hyder supported this resolution.

The Chairman put the resolution to the Board in two parts. The first part in regard to the Board recommending that a money grant on a fifty-fifty basis should be made by the Government of India was lost. The second part regarding the provision of short vernacular elementary courses in dairying in each province was passed. The Board also agreed to reply to the Government of India that there was great scope for one or two Central Institutes for education and research in dairying.

7. *Proceedings of the third meeting of the Sugar Committee held in August 1930 (subject No. 6 of the agenda) (Appendix VIII).*—These were noted.

8. *Establishment of a sugarcane seedling testing station in Bengal (subject No. 7 of the agenda) (Appendix IX).*—After Mr. Finlow had briefly explained the scheme Mr. Burt said that the proposal was recommended by the Sugar Committee. It formed part of the Committee's general scheme for a chain of sugarcane testing stations for the main sugarcane belt in Northern India. In his opinion, the importance of testing and propagating new varieties of cane could hardly, be over estimated. During the last 5 years Java had replaced the whole of its canes by a new variety even though the canes previously grown were highly productive. The result of this replacement was that production had been increased greatly beyond what five years ago would have been thought possible. Mr. Hilson said that the Madras Government had established

and were maintaining a sugarcane station at Anakapalle out of their own resources and he would require whether the Council would help with funds to extend that station. He was informed by the Chairman that this was a matter for Madras. If the Provincial Government submitted a scheme of sugarcane research it would in due course be placed before the Sugar Committee.

The Board agreed to recommend the scheme for the favourable consideration of the Governing Body.

9. *Scheme for an economic enquiry into the cost of sugarcane production in the United Provinces, North Bihar, Bombay and the Punjab (subject No. 8 of the agenda) (Appendix X).*—Mr. Burt introduced the proposal which Mr. Finlow supported. In the latter's opinion it was very necessary to know the cost of production of various crops. In Bengal, for instance, during the last six months owing to the slump in the price of jute it had become of importance to compare the cost of production of jute with that of sugarcane and other alternative crops. Such data relating to cost of production for various crops would be of very great value. Mr. Milne said that they in the Punjab were starting a sugar factory and were very anxious to know the cost of sugarcane production. He would in the Punjab divide the enquiry not into irrigated and non-irrigated tracts but take one representative area in the South East Punjab and one in the Canal Colonies. The Chairman referred Mr. Milne to the proceedings of the Sugar Committee which had recommended that the actual tracts for enquiry would be decided upon later in consultation with Directors of Agriculture; it would be in co-operation with and on the advice of Directors of Agriculture that the enquiry would proceed. Mr. Robertson-Brown was against a costly investigation. He had in his own province not found any difficulty in finding out the cost of production and he thought that any intelligent agricultural man should have no difficulty in this matter. Mr. Hilson asked why Madras had been omitted from the scope of this enquiry. Mr. Burt replied that that was so because the Madras Government had informed the Government of India that they saw no possibility of an expansion of sugarcane in the Madras Presidency. Mr. Hilson said that the results of such an economic enquiry if conducted in Madras might help in extending the area under sugarcane in Madras, where it was desirable to limit the extension of paddy cultivation by encouraging the cultivation of alternative crops of which sugarcane was one of the most important. In reply to Dr. Agharkar the Chairman said that the man who would be chosen as the Economist who would direct the scheme would probably be recruited from among the ranks of Indian University Professors. Mr. Milne suggested that the questionnaire for the enquiry should be drawn up by a small committee. The success of the enquiry depended, in his opinion, on the comprehensiveness of the questionnaire. The success of the economic enquiries conducted in the Punjab by the Board of Economic Enquiry was very largely due to the excellence of their questionnaire. The Chairman agreed that a committee should go into this matter but after the Principal Economist had been appointed. Mr. Carpenter in supporting the scheme said that the method adopted whereby the whole scheme would be under the direction of one man who would direct and co-ordinate the work of the various parties in the provinces was, in his opinion, the right way to work all-India schemes financed by the Council.

The Board agreed to recommend the scheme for sanction of funds by the Governing Body.

16. *Sugarcane research scheme for the Bombay Deccan (subject No. 9 of the agenda) (Appendix XI).*—Mr. Main in introducing the scheme drew the attention of the Board to the detailed statement of the case which had already been circulated to the Board. Mr. Burt said that this was undoubtedly an expensive scheme but the Sugar Committee after consultation with which this scheme had been prepared by Mr. Main considered that it was no use tinkering with the problem of sugarcane in the Bombay Deccan. Mr. Burt also drew the attention of the Board to paragraphs 2 and 3 of the note (Appendix XI) circulated to the Advisory Board in connection with this scheme which showed that allowing for the contribution of the Bombay Agricultural Department and for receipts from the cultivation of 100 acres of land the net cost of the scheme if sanctioned by the Council would be reduced to Rs. 2,76,238 over a five year period. This, in his opinion, was a reasonable figure and the expenditure proposed was justified by the importance of the scheme to Deccan agriculture as a whole. Mr. Main said that in forwarding the scheme (Appendix XI) to the Imperial Council of Agricultural Research his Government had said that it was prepared to enter into negotiations about its contribution to the Scheme, and hence he thought this particular point about receipts might fairly be made the subject of negotiations with the Bombay Government as he considered the suggestion of Mr. Burt reasonable. Mr. Robertson-Brown opposed the scheme as he thought that this was a provincial matter. Mr. Plymen said that information in regard to the effect of irrigation on black cotton soil which would be investigated under this scheme was of more than provincial importance, a statement with which Mr. Hilson in supporting the scheme also agreed. Mr. Plymen remarked that the question of crediting receipts accruing from a piece of work financed by the Council had never before been raised until this meeting. He thought that in future it should be. In regard to the Rs. 11,070 provided for residential quarters the Board considered that as the amount was small in relation to the total expenditure and as the local Government would in any case be making a contribution towards the cost of the scheme it was not worth while insisting in this case that the cost of these quarters should be borne by the local Government. Mr. Sethi proposed that the scheme be referred to a sub-committee for the examination of details. This was not accepted by the Board which recommended the scheme for the favourable consideration of the Governing Body.

M. S. A. HYDARI,

Secretary.

The 13th January 1931.

PROCEEDINGS OF THE MEETING OF THE ADVISORY BOARD
OF THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH
HELD AT NEW DELHI ON WEDNESDAY, THE 14TH
JANUARY 1931.

The following were present :—

1. Diwan Bahadur Sir T. VIJAYARAGHAVACHARYA, *Chairman*.
2. Mr. B. C. BURT.
3. Mr. P. H. CARCENTER.
4. Mr. G. K. DEVADHAR.
5. Mr. R. S. FINLOW.
6. Dr. N. N. GANGULI.
7. Mr. K. HEWLETT.
8. Mr. G. R. HILSON.
9. Dr. L. K. HYDER.
10. Mr. NIZAMUDDIN HYDER.
11. Dr. B. A. KEEN.
12. Mr. P. J. KERR.
13. Mr. T. F. MAIN.
14. Mr. D. MILNE.
15. Colonel A. OLVER.
16. Mr. F. J. PLYMEN.
17. Mr. T. F. QUIRKE.
18. Mr. W. ROBERTSON-BROWN.
19. Mr. P. T. SAUNDERS.
20. Mr. R. L. SETHI.
21. Major R. F. STIRLING.
22. Mr. W. TAYLOR.

Mr. M. S. A. HYDARI, *Secretary*.

The following attended as visitors :—

1. Dr. S. P. AGHARKAR.
2. Mr. B. A. COLLINS.
3. Dr. W. H. HARRISON.
4. Dr. W. McRAE.
5. Dr. K. C. MEHTA.
6. Mr. F. J. WARTH.

2. The meeting lasted from 11 A.M. till 1.45 P.M. when the Board adjourned till the 15th at 11 A.M. to allow the sub-committee on the rice research scheme from United Provinces meeting and reporting in the interval.

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3. *Appointment of Veterinary Research Officers in the Provinces.*—
(Appendix XII).—(a) Scheme for research into the protection of buffaloes and cattle from Hæmorrhagic Septicæmia by the Bacteriophage Method in Bengal. (Appendix XII).

(b) Application for a recurring lump sum grant for three years to cover the pay of a research officer and equipment to investigate the causes of contagious diseases in animals in the Central Provinces.

(Subject No. 10 of the agenda). (Appendix XII).

Colonel Oliver in introducing the subject said that after a prolonged survey of the position in India he had come to the conclusion that instead of financing isolated schemes of veterinary research in the provinces two of which, one from Bengal and one from the Central Provinces, were already before the Advisory Board it would be better to organise disease investigation sections in the provinces concentrating pure research at Muktesar. He had accordingly drawn up a scheme (Appendix XII) for the appointment of veterinary investigation officers in certain provinces where they were most needed and which he submitted the Board should consider in substitution of the schemes from Bengal and the Central Provinces. Mr. Kerr said that he supported the scheme and agreed to the merging of the Bengal proposal in the "All India" Scheme, but urged that this should not delay an early start being made by deputing an investigation officer to Bengal.

It was likely that they would be in a position to offer facilities for the work in Bengal as there was a well equipped laboratory in the Veterinary College which was not being fully utilised for want of a research officer. Dr. Hyder while supporting Colonel Oliver's scheme pleaded for its extension to the North-West provinces and Baluchistan. As he understood it the object of the scheme was a systematic collection of facts about veterinary disease. In his opinion it was through the North-West Frontier of India that a good many of the veterinary diseases which inflicted the country filtered through and he therefore considered that a disease investigation staff in the provinces he had mentioned was highly necessary. Major Stirling pointed out that there was great scope for veterinary investigation in the Central Provinces, as in these Provinces they probably had almost every disease known to the veterinary profession. He further stated that, unless this Board recommended some annual grant of money to the Central Provinces, it was unlikely that an investigating veterinary officer would be appointed there for many years. Mr. Quirke said that they in the Punjab knew that disease was coming in from the North-West but they had no powers to take remedial measures. Dr. Hyder replied that all countries adopted control measures on their frontiers but that the first requirement was the ascertainment of facts. Mr. Davadhar supported Dr. Hyder in the resolution which he moved :—

"That the sum proposed be raised to one lakh of rupees for bringing effectively the North-West Frontier Province and Baluchistan into line with the rest of British India for the protection of the country".

Professor Agharkar said that he could not understand why it was taken for granted that there were no veterinary officers in any of the provinces who could or were able to do the work of collecting informa-

tion. Further why could not veterinary graduates be deputed to do such work. The Board, in his opinion, should be satisfied that the work could not be done by the agencies which existed at present before recommending the creation of a new agency. The Professors of Pathology at veterinary colleges might, in his opinion, also be asked to take a hand in disease investigation. Mr. Taylor replied that Professors of Pathology were fully employed with work in the colleges and had no time to do field investigation--a statement to which Professor Agharkar demurred. In the latter's experience Professors of Colleges could and did do field investigations as well as their ordinary college duties. Mr. Taylor was in entire agreement with the difference which Colonel Olver had made between research officers and investigators. In his opinion investigators should have the highest possible qualifications which according to Mr. Hewlett ordinary veterinary graduates of Indian Colleges do not possess. They could not be considered on the same level of education as University graduates. Professor Agharkar replied that the only inference which could be drawn from this state of affairs was that the education given in veterinary colleges in India was highly defective. Mr. Collins pleaded for the inclusion of Indian States especially Hyderabad which was a constituent of the Council in any general co-ordinated scheme of veterinary investigation as the present one. The solution of the veterinary disease problems of Hyderabad was very important not only to Hyderabad but to the adjoining British territory. In so far as the State which he represented was concerned it was not so financially bankrupt as some of the British Provinces and would very likely be able to contribute something towards the scheme if it was included therein. He was therefore of opinion that the Council should help Hyderabad which was prepared to help itself. Colonel Olver in answering the various points raised in the discussion stated that it was unfortunate that the training at present given in the veterinary Colleges in India was not of a sufficiently high standard to fit the graduates from there for work of the nature proposed. He hoped that in course of time arrangements would be made for giving veterinary instruction of a higher standard at the Lahore Veterinary College. He did not think that the College staff could do investigation, they could only submit material for research. Veterinary Officers in the districts on the other hand had their hands fully tied with disease control work and had no time for investigation. He was quite agreeable to the inclusion of Hyderabad in the general scheme as well as to that of the North-West Frontier Province, but he did not think that the case for the inclusion of Baluchistan was very strong. The country was very sparsely populated and, in his opinion, they ought to wait till a reconstituted Sind would take charge of veterinary questions in Baluchistan. Dr. Agharkar was of opinion that if a questionnaire carefully designed were drawn up and distributed to district officers they would probably be able to collect all the information required. Mr. Saunders wanted Madras and Mr. Quirke the Punjab to be brought into the scheme. There was no reason in the former's opinion why if a province had done something on its own it should be denied what was being granted to provinces which had lagged behind. Mr. Quirke said that for lack of funds the services of the officer recently appointed in the Punjab could not be utilised to the full extent. Mr. Hewlett and Professor Ganguli thought that the staff should work under the Council but this was opposed by Colonel Olver, Mr. Milne and Mr. Kerr. In their opinion it was better to let the work be under the

Provincial Directors of Veterinary Services. When a staff centrally controlled was working in a province it was generally found that it was jealous of advice or direction from the local authorities. The Provincial Directors were better acquainted with local conditions and, if held responsible for the work, would have every incentive to see that their local staff gave the special staff every possible assistance. They therefore thought that collaboration between the central and the local authorities which was so desirable could be best achieved if the actual workers were under the control and direction of the latter which in turn kept touch with the central organisation. Mr. Hilson thought that the scheme was incomplete. In his opinion what was required to complete it was to obtain the concurrence of provinces and Indian States not included in the scheme to their supplying information to a central authority which should also be created. It was little use collecting information in certain places and leaving matters at that. Colonel Olver said that he quite realised that the scheme was incomplete and he also visualised the time when the creation of a central organisation would become imperative. This scheme was meant merely to start things. If it proved a success it could and would be developed. Mr. Carpenter said that Mr. Hilson's point was a very good one. He would also emphasize the desirability of a central co-ordinating head. He thought that the Council should at least have a scheme for a central office so that even if it was not sanctioned at once for lack of funds the Council would know the directions in which expenditure would have to be incurred in the future if the present scheme (Appendix XII) were sanctioned. The great thing, in his opinion, was co-ordination and there were not many difficulties in the matter of a central organisation. The obvious person, in his opinion, to be the head of any such organisation was the Director of Muktesar helped with a special *ad-hoc* staff. The Chairman in winding up the discussion said that he had been greatly impressed with what had fallen from Dr. Agharkar but as unfortunately seemed to be the case that the veterinary staff at present in India was neither adequate nor of a high enough quality there might be occasion in certain cases to depend upon Indians who had had their veterinary training abroad until at least such time as facilities to which Colonel Olver had referred for higher veterinary training were provided at the Lahore Veterinary College.

In the matter of control the Chairman considered that on the whole it would be better in this case to delegate control to Provincial agencies rather than keep it in the hands of the Council. He would, however, lay down no hard and fast rules but consider each case as it came along on its merits. He was attracted with the idea of a co-ordinated scheme as suggested by Messrs. Hilson and Carpenter, but he was afraid that if the Council waited till such a very comprehensive scheme was worked out and financed they might end in doing nothing. He was therefore in favour of the Board being satisfied with the degree of co-ordination and comprehensiveness achieved in Colonel Olver's scheme. (Appendix XII).

The Board then proceeded to vote on the several proposals made. The proposal finally accepted was to recommend for sanction Colonel Olver's co-ordinated scheme with the inclusion therein of Hyderabad, the North-West Frontier Province and Baluchistan, each unit costing about Rs. 10,000 per annum *minus* such sum as Hyderabad would be prepared to contribute towards the work within its own territory. It was reckoned that the total expenditure would be in

the neighbourhood of a lakh and ten thousand per annum *minus* the Hyderabad contribution (unspecified). The scheme would be for five years.

4. *Proposals for (a) investigations on virus diseases of plants, and (b) physiologic forms of wheat rust in Bombay (subject No. 11 of the agenda). (Appendix XIII).*—The Chairman announced that the Board announced that the Board would take the two schemes separately into consideration.

5. *Investigations on virus diseases of plants [subject 11 (a). (Appendix XIII)]*.—After Mr. Main had explained the scheme Messrs. Burt and McRae spoke in support of it. Dr. McRae's previous comments on this scheme had already been circulated to the Board. Mr. Carpenter enquired whether it would not be advisable to make the scheme into an all-India one rather than localise it. Dr. McRae replied that very little was known about virus disease. Samples would have to be taken and they might just as well be the plants proposed in the present scheme. When so little was known on the subject it was better to begin in a small way; after all even if an all-India scheme was planned they would have to take examples and the ones proposed in the present scheme were, in his opinion, quite suitable. Dr. Keen agreeing with Dr. McRae said that in regard to virus diseases so little was known that it was as well to have a local investigation which might provide clues; thereafter it might be possible and desirable to work out a co-ordinated scheme for all-India. Dr. Keen further drew attention to the statement in the letter from the Director of Agriculture, Bombay, to the Government of Bombay, dated the 5th April 1930 in which mention was made of the co-operation of Dr. Uppal, Dr. Likhite and Mr. F. J. Dastur in the working of this scheme. These three scientists would not be working in the same laboratory but in places far apart. It would therefore not be team work of which he was all in favour but rather committee work which was not so desirable. Mr. Main explained that Dr. Keen had somewhat misunderstood the position which arose out of the fact that both the schemes, namely, the one on virus diseases and that on the physiologic forms of wheat rust were dealt with in one and the same letter. In actual fact the scheme of research on virus diseases would be under Dr. Uppal in collaboration with, as Mr. Burt added, Dr. Likhite of Baroda. Before putting the scheme to the vote the Chairman observed that one financial statement had been drawn up for both the schemes. It was therefore not possible to state what grant the Council would have to make if only the scheme on virus diseases was recommended by the Board and sanctioned by the Governing Body. He therefore suggested that the Board should approve the scheme and leave the question of the amount of money to be provided therefor to be worked out separately.

The Board agreed to the Chairman's suggestion and approved the scheme.

6. *Investigations on physiologic forms of wheat rust in Bombay [subject 11 (b). (Appendix XIII)]*.—After Mr. Main had introduced the scheme the Board adjourned till 11 A.M. on the 15th.

M. S. A. HYDARI.

The 14th January 1931.

PROCEEDINGS OF THE MEETING OF THE ADVISORY BOARD OF
THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH
HELD AT NEW DELHI ON THURSDAY, THE 15TH JANUARY
1921.

The following were present :—

1. Diwan Bahadur Sir T. VIJAYARAGHACHARYA, *Chairman*.
2. Mr. B. C. BURT.
3. Mr. P. H. CARPENTER.
4. Mr. G. K. DEVADHAR.
5. Mr. R. S. FINLOW.
6. Dr. N. N. GANGULI.
7. Mr. K. HEWLETT.
8. Mr. G. R. HILSON.
9. Dr. L. K. HYDER.
10. Mr. NIZAMUDDIN HYDER.
11. Dr. B. A. KEEN.
12. Mr. P. J. KERR.
13. Mr. T. F. MAIN.
14. Mr. D. MILNE.
15. Colonel A. OLVER.
16. Mr. F. J. PLYMEN.
17. Mr. W. ROBERTSON-BROWN.
18. Mr. P. T. SAUNDERS.
19. Mr. R. L. SETHI.
20. Major R. F. STIRLING.
21. Mr. W. TAYLOR.

Mr. M. S. A. HYDARI, *Secretary*.

The following attended as visitors :—

1. Dr. S. P. AGHARKAR.
2. Mr. B. A. COLLINS.
3. Dr. W. McRAE.
4. Dr. K. C. MEHTA.
5. Mr. F. J. WARTH.

2. The meeting lasted from 11 A.M. till 4-45 P.M. with an interval for lunch from 1-10 to 3 P.M.

3. *Proposals for investigations on the physiologic forms of wheat rust in Bombay (subject 11 (b) of the agenda). (Appendix XIII).—* Dr. Mehta spoke in explanation of his note (Appendix XIII) on the Bombay scheme which had been circulated to the Board. He considered

that there would be a definite advantage if this scheme were postponed till he could put before the Council the results of his investigations which he hoped would be completed by 1932. What he was after in his scheme was to breed rust resisting varieties for the hills. If this could be done the advance of the rust into the plains would be stopped to a great extent. He therefore felt that consideration of the Bombay scheme (Appendix XIII) should be postponed for the time being and that later when the results from his own investigations were available a co-ordinated scheme should be drawn up with the help of Mycologists in India for an attack on the problems which would then remain to be solved. Dr. Mehta informed Professor Ganguli that his first report would be submitted in March 1931 but that would only be a progress report containing no conclusions. Dr. McRae said that the problem appeared to him to be as follows. Supposing Dr. Mehta found that the rust only came through the hills the thing became simple. There was no necessity then for breeding rust resisting varieties in the plains. If, however, it was found that forms of rust did exist in the plains then infection was not eliminated but only reduced by the growing of rust resisting varieties in the hills. In the latter contingency it would mean that instead of tackling the problem of rust in the plains now along side with Dr. Mehta's investigation into rust in the hills they would have to start two or three years later; he was not in favour of this loss of time. Mr. Burt said that he was in favour of waiting till the Council had before it Dr. Mehta's preliminary results. The big wheat growing area was concentrated in the North where the solid weight of wheat cultivation lay. Before therefore subsidiary investigations like the one proposed by Bombay (Appendix XIII) were supported he should like to see the preliminary results and then have the matter discussed in the summer session of the Advisory Board in 1932. If Dr. Mehta was right that the rust came solely from the hills then the problem was simplified; if he was not correct then a much bigger organisation than had hitherto been contemplated would have to be evolved to tackle the problem on an all-India basis. He was therefore in favour of passing no opinion on the Bombay scheme (Appendix XIII) till the summer meeting of the Advisory Board in 1932. In reply to Mr. Hilson who enquired whether the wheat plant was the only one which passed on rust to the plains Dr. Mehta replied that the chances were remote that plants other than wheat would transmit the kind of rust which affected wheat in the plains. The rusts of wheat and those found on grasses were totally different. Answering Dr. McRae, Dr. Mehta said that he was convinced that there was no rust which lived through the summer in the plains. The high temperature killed it. Mr. Carpenter was in favour of Mr. Burt's proposal to postpone consideration of the Bombay scheme. Dr. Agharkar in supporting the Bombay scheme said that rust appeared in the Deccan at the same time as in Northern India. If therefore it came from the hills how was it that it did not appear later in the Deccan than in Northern India. He thought it might be possible therefore that there were other sources of infection and he was in favour of allowing Bombay to carry on the investigation at the modest financial cost proposed. In reply to Dr. Hyder Mr. Main informed him that the altitude of Poona was about 2,000 feet above sea level, the maximum temperature being about 105° in the hot weather and in the seventies in the cold weather, while the minimum was about the freezing point. The maximum height

of the Western Ghats was 4,500 to 5,000 feet. Dr. Mehta also in reply to Dr. Hyder said that the limit of cultivation in the Himalayas went up to about 9,000 feet. In the Kumaon hills no rust survived below 4,000 feet. Mr. Plymou referring to Dr. Agharkar's point as to the simultaneous appearance of rust in Northern India and Deccan said that there was no question of a race from north to south. The rust was probably there already. It was the climatic conditions which brought it out. He agreed that a comprehensive scheme should be drawn up with the help of Mycologists in India including Dr. Mehta and that the Punjab and the United Provinces which were the largest wheat growing areas in India should be brought into the scheme. Mr. Milne agreeing with Mr. Plymou said that he noticed that the intensity of the rust did not seem to decrease with the distance from the hills and he thought that there might just be a possibility that rust survived in the plains from year to year. He therefore suggested that a committee should be appointed which would formulate a co-ordinated programme of research. Mr. Main pointed out that there was no reference to physiological forms in the Wheat Rust Scheme drawn up by Dr. Mehta a year ago and sanctioned by the Imperial Council of Agricultural Research. He pointed out that the Bombay Scheme was before the Council before Dr. Mehta turned his attention to the physiological forms of rust, and he thought that the argument that the scheme should be postponed, pending the discovery of the origin of rust, was not convincing, especially as all the mycologists, except Dr. Mehta, including Dr. MacRae, Dr. Uppal and Mr. Dastur were in favour of proceeding with the scheme. Mr. Devadhar was in favour of approving the Bombay scheme.

The Board was of opinion that the Bombay scheme should lie over for the present and that in the meantime a reference should be made to a committee of Mycologists, including Dr. Mehta, to work out a co-ordinated scheme of rust research; no definite time was fixed for the committee, whose personnel it was left for the Chairman to fix, to submit its report.

4. *Application from Dr. S. S. Bhatnagar for a grant of Rs. 3,000 a year, for two years, for research on the effect of different ions on plant growth (subject No. 12 of the agenda). (Appendix XIV).*—Mr. Milne introduced the proposal which both Mr. Burt and Dr. Keen supported. The latter said that the research proposed by Dr. Bhatnagar was not only a piece of fundamental research work but would have a practical bearing. At the present time, for example, certain manufacturers of manures added substances such as those mentioned by Professor Bhatnagar in his letter which they claimed added to the effectiveness of such manures. The latter, of course, they sold at a higher price. It was not possible for Agricultural Departments to advise on what might be called "doctored" manures without the information which work like that proposed by Dr. Bhatnagar would give. He therefore heartily supported the scheme and would draw Professor Bhatnagar's attention to the work of Dr. Voelckar at Woburn which had been financed out of the Hill bequest. Dr. Voelckar's work was highly suggestive and might be of assistance to Dr. Bhatnagar in his investigations. The Board agreed to recommend the scheme for sanction.

5. *Application from Dr. S. S. Bhatnagar for a grant of Rs. 4,150 a year, for two years, for investigations on the relation between the physico-chemical properties and fertility of soils (subject No. 13 of the*

agenda). (*Appendix XV*).—Mr. Milne introduced this scheme. Dr. Keen said that he was not as enthusiastic about this scheme as he was for the previous one. In this connection he drew attention to paragraph 2 of Professor Bhatnagar's letter (*Appendix XV*) which ran as follows:—

"The whole province will be divided into a number of climatic zones and representative soil samples will be taken from each area. The fertility value will be ascribed to each sample from a knowledge of the cropping history, ascertained from the actual farmers and other men on the spot and the Agricultural Department".

He said that no definite value of the fertility of a soil could be given and that therefore there could be no effective correlation between exact data obtained by the laboratory tests and vague statements about good, moderate or indifferent fertility. This, in his opinion, was the weak point of the scheme. It really brought out the disadvantage from which the scientist suffered when he came down to tackle the problems of practical agriculture. Mr. Milne said that they of the Punjab Provincial Research Committee had realised what Dr. Keen had pointed out but they had felt that in view of the definite data regarding crop cutting experiments, etc., available in the Punjab Government Farms useful results might be obtained by having a try especially as the cost of the scheme was very modest. Mr. Burt explained that he had since had a conversation with Dr. Bhatnagar who had informed him that he proposed in the first place to begin on the soils from Kalabagh near the Khewra Salt Range some of which are barren probably due to the presence of sulphides. As regards the more general problem, Dr. Bhatnagar considered that he could get the necessary fertility records from Government Experimental Farms and from a few private land-holders who had the records of yields in different fields for a series of years. Mr. Burt thought that in any case the first problem which Professor Bhatnagar proposed to tackle was definite enough. Dr. Keen agreed that this had provided a clear issue and he was therefore prepared to support the scheme, all the more so if he would be allowed to assist Dr. Bhatnagar in the course of his research. Mr. Milne said that any assistance which Dr. Keen could give would be heartily welcomed not only by himself but by the Punjab Research Committee.

Finally the Board agreed to recommend the scheme for sanction on the understanding that the problem of barrenness in Punjab soils from causes other than alkali would form the first part of Dr. Bhatnagar's investigation.

6. *Scheme for the appointment of a Physical Assistant on the staff of the Agricultural Chemist, Bengal, (subject No. 14 of the agenda)*. (*Appendix XVI*).—Mr. Finlow introduced the scheme. Mr. Burt said that unless the Agricultural Chemist, Bengal, got an Assistant he could not collaborate with the Dacca University in the soil work for which the Council had recently given a grant; but for the absence of Mr. Finlow on leave the present proposal would have been made to the Council along with the Dacca scheme and as a part of it. Professor Ganguli also spoke in support.

The Board agreed to recommend the grant for sanction.

7. *Application for a grant for experiments on manuring and marketing new types of barley (subject No. 15 of the agenda)*. (*Appendix XVII*).—Mr. Sethi introduced the scheme. Mr. Burt said that it was

very satisfactory to note that through the agency of the Indian Trade Commissioner arrangements had now been made whereby at the request of the Council the Institute of Brewing would carry out detailed examination of barleys including actual malting tests at the moderate cost of from 3 to 4 guineas per sample. Mr. Milne recalled that a few years ago a firm of barley exporters had found that while certain cargoes of barley which they exported to England from the Punjab were quite good, other cargoes did not germinate evenly on the malting floor. He had found that barleys from different localities germinated after different periods in germination pans and he advised firms to see that consignments from Karachi consisted of barleys from the same locality. He thought that this was a matter which should be further investigated. In any case he would like the Punjab to be included in this investigation. Mr. Burt said that there would be no difficulty in the Punjab participating, if Mr. Milne would put up a suitable scheme it could be considered at the next meeting of the Board.

The Board agreed to recommend the scheme for sanction.

8. (a) *Establishment of Nutrition research sections in major provinces to work in collaboration with the proposed Nutrition Institute at Dehra Dun.* (b) *Appointment of a Physiological Chemist to study Animal Nutrition problems of Dacca, (subject No. 16 of the agenda).* (Appendix XVIII).—Colonel Olver in introducing the scheme remarked that he would like the Bengal scheme to be considered as forming part of the co-ordinated scheme which he had prepared for the Board's consideration. Mr. Warth said that there was no question either for the need or for the value of this work but he was doubtful whether they would get suitable men to do it all at once. Mr. Finlow said that the Bengal scheme (Appendix XVIII) was a logical outcome of the work done in Bengal on cattle for the last 15 years. The cattle in North East India were the worst in India but it was of little use improving the quality of the cattle unless there was food for them. He gave the assurance that any work which would be carried on at Dacca would be in collaboration with Mr. Warth and that they would welcome any suggestions which Colonel Olver would make. Dr. Agharkar thought that the Council should wait and see the results of the Central Institute at Dehra Dun proposals in regard to which had been discussed by the Board the other day. The argument had been advanced that at the Central Research Institute at Dehra Dun they would be able to test all kinds of fodder. In the circumstances he was for cutting off these provincial offshoots. Mr. Hilson said that the Council was dealing with sugarcane, rice and animal diseases as all-India problems. He wondered whether the Council should not take stock of its position and as its means were limited draw up a list of schemes in the order of urgency instead of considering schemes as they came up. If such a list were drawn up he would put the present scheme as being among the first. Professor Ganguli recommended that each province should draw up a scheme and collect all the information on fodders available. Thereafter the Animal Husbandry Expert to the Council should put up a combined scheme for the consideration of the Board. Colonel Olver answering Professor Agharkar said that the Central Institute of animal Nutrition at Dehra Dun would certainly test all kinds of fodder but that it could not obviously carry out field experiments in the provinces. He agreed that one of the difficulties would be to get suitable workers, but he hoped that when the Central Institute of

Animal Nutrition was started it would train and lend workers for provincial investigations. As he anticipated some delay in the foundation of such a Central Institute he thought that they should make a start with such schemes as the one submitted by Bengal. Professor Agharkar enquired whether Professors of Animal Physiology in Veterinary Colleges could not be pressed into service for this work. He objected to educational institutions in India being set aside when there was a question of research. Colonel Oliver entirely agreed with Professor Agharkar that this should not be so; unfortunately Veterinary Colleges in India had generally no farms and therefore it would be difficult for the college staff in some places to take a hand in this work. On the other hand, the veterinary college at Patna had a farm and there he thought that animal nutrition work should be carried out at this farm with the necessary accommodation and facilities and that the assistance of the college staff should be invoked, this was, however, a matter which it was for the provinces to suggest. Mr. Hilson also answering Professor Agharkar said that it was not only necessary to determine the feeding value of different fodders but also the reactions of the different breeds to different fodders in the different conditions in which they existed. Investigations in the provinces were therefore absolutely necessary.

The Chairman said that he would put the two schemes, namely, the Bengal scheme as well as Colonel Oliver's general scheme to the vote separately, otherwise if only the general scheme was recommended by the Advisory Board but rejected by the Governing Body it might happen that the Bengal scheme which was a distinct one might be rejected *ipso facto*.

The Board agreed to recommend the Bengal scheme as well as the general scheme.

9. *Application from Dr. H. C. Chaudhuri for a grant of Rs. 12,600 spread over three years for investigation of the "wither tip" of citrus trees (subject No. 17 of the agenda). (Appendix XIX).*—Mr. Milne introduced the scheme which after Mr. Robertson-Brown and Mr. Carpenter, the latter saying that Assam was particularly interested in this investigation, had spoken in support the Board agreed to recommend for sanction.

10. *Proposals for the establishment of a research station at Shillong for the development of Bee-keeping in India (subject No. 18 of the agenda). (Appendix XX).*—Dr. Keen in introducing the scheme said that if it was desired to develop bee-keeping in India the way suggested in the scheme of the Imperial Entomologist was the way to do it, but Dr. Keen had no knowledge of the demand in the country and he thought that the Board should be guided in this matter by the views of representatives of the provinces. He also thought that it would be very difficult to get the right type of man to take charge of this scheme. Dr. Hyder supported the scheme on the ground that it might lead, if successful, to the establishment of a cottage industry in India. The Royal Commission on Agriculture had stressed the importance of the development of cottage industries in India. Professor Agharkar said that he was diffident about the scheme as outlined. He saw that Rs. 20,000 per annum had been provided on account of the cost of the officer and Rs. 10,000 for other items of expenditure and he considered the total cost excessive. He was also not in favour of appointing the expert from abroad who would go away after three years with all the accumulated

knowledge gathered by him which would be lost to India. If there was scope for the development of bee-keeping in India he thought a better course would be to send a promising student abroad with a scholarship who on his return could tackle with the subject. Mr. Plymen said that bee-keeping was not a matter of general importance in India and he was therefore not particularly keen on this scheme. He thought that the problem of bee-breeding should be one of the problems which should be referred for investigation to Universities with the help of a small grant. Mr. Collins said that he thought the scheme was too expensive. The bee-industry in India was not likely to become a cottage industry in the plains owing to climatic conditions. Flowers grew in India all the year round and there was therefore no incentive such as they had in colder climates for bees in India to store their honey except in very limited areas. If, however, it was desired to investigate the question he would suggest either, as Dr. Agharkar had proposed, to send a student from India with a scholarship abroad or, as Mr. Plymen had recommended to add it to the list of problems which would be referred to Universities for a grant. Mr. Burt said that the economic problem should be kept separate from the technical. He did not think that on present information there was sufficient justification for the view advanced by Mr. Collins that India was not a suitable place for bee-keeping. It might be that if the right type of bee was obtained a cottage industry might be established. The question which they had to decide was whether bee-keeping was worth while. If the answer was in the affirmative then he would support the adoption of Dr. Agharkar's proposal to send a student abroad with a scholarship for training instead of importing an expert from abroad. Mr. Carpenter in opposing the whole scheme said that its annual cost was Rs. 30,000. The Board had been informed that for this amount three Animal Nutrition Sections could be run in the provinces. There was no question as to the relative importance of the two. This was only an example. In his opinion there were many much more important problems both in agriculture and animal husbandry than bee-keeping to which the Council could profitably devote its funds.

The Board did not recommend the scheme for sanction.

11. (a) *Revised scheme of research in fruit-growing in Madras (Appendix XXI)*. (b) *Scheme from Assam for investigating the possibilities of fruit culture in Assam (Appendix XXII) (subject No. 20 of the agenda)*.—There was a general feeling in the Board that there was need for fruit research both in the provinces and at a central station. As it happened the only provinces which had submitted schemes of fruit research were Madras and Assam. (Appendices XXI and XXII). The Board was of opinion that instead of considering individual isolated schemes it would be better if a committee were to go into the whole question of fruit research in India and submit proposals for work. At the same time it was felt that such a proceeding would not be quite fair to Madras which when it had come to the Board with a scheme for fruit research at its last meeting in June 1930 had been asked to revise it in certain respects and in the hope also that in the interval other provinces concerned would submit fruit schemes so that the problem could be discussed as a whole. No other province, except Assam, (Appendix XXII) had done so and it was rather hard that Madras which had revised its scheme (Appendix XXI) should have to wait a further period for its consideration.

On the other hand the Board felt strongly that the problem should be tackled as a whole and with the consent of Mr. Hilson, the Madras representative, agreed that a fruit committee should be constituted which would meet about three months hence to sift schemes of fruit research and to make proposals; that this committee should examine the Madras scheme first and that the scheme, if approved, by the committee with or without amendment, should be submitted direct to the Governing Body without its being brought before the Advisory Board as would be done in the case of other schemes. The period of three months was given to enable provinces to come forward with such proposals for fruit research as they thought necessary.

The Board also agreed with Mr. Plynten that full advantage should be taken of such assistance in the examination of schemes as the Imperial Bureau of Fruit Production at East Malling could render. Though such a proceeding was somewhat unusual it would probably be advisable in view of the fact that very little scientific work on fruit had of recent years been done in India to utilise the store of information available at the Bureau.

12. *Application for a grant for experimental work on the cold storage of mangoes and for experimental shipments of mangoes to Europe (subject No. 19 of the agenda).*—The Bombay Government had requested that consideration of this scheme be postponed for the present. This was agreed to.

13. *Application from Dr. A. E. Slater, Mission Poultry Farm, Etah, for a grant for 5 years for breeding experiments in connection with the improvement of goats (subject No. 21 of the agenda). (Appendix XVIII).*—Colonel Olver speaking in support of the scheme said that the local Government should pay the capital expenditure thereon. Mr. Collins said that the Council should assist the scheme. In Hyderabad they were going to do the same thing as was proposed in the present scheme without asking the Council to contribute and he agreed with Colonel Olver that the local Government should be asked to bear the capital expenditure on this scheme. He also noticed that income had not been allowed for in the form of receipts. In reply to Mr. Devadhar Col. Olver stated that the scheme for the improvement of the breed of goats was meant as a measure of research and not as a business and for that reason it was not contemplated to produce bigger number of animals of this type for which the establishment of Co-operative Societies and the encouragement of Co-operative Societies among the villagers would be one of the ways. Dr. Agharkar asked whether the research would be towards the improvement of goat milk or goat meat. Mr. Sethi informed him that the research would be for the improvement of milk. Dr. Hyder supported the scheme and bore testimony to the good work already done by Dr. Slater in spreading improved strains of poultry in the tract round about his mission. Mr. Burt said that the Jamnapari breed of goats was so good that some years ago the Dutch found it worth while to import considerable numbers into Java. If this breed was saved from extinction and at the same time kept up to standard it would help the Jamnapari tract in the United Provinces which was the most famine stricken part of that province. When asked by the Chairman whether he could suggest a compromise in regard to the share of the Local Government in the cost of

the scheme Mr. Burt proposed that the local Government be asked to pay Rs. 8,000 out of the total capital expenditure of Rs. 15,000.

The Board agreed to recommend the scheme subject to the local Government finding Rs. 8,000 out of the total non-recurring expenditure of Rs. 15,000, the Council bearing the whole of the recurring expenditure.

M. S. A. HYDARI.

The 15th January 1931.

PROCEEDINGS OF THE MEETING OF THE ADVISORY BOARD
OF THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH
HELD AT NEW DELHI ON FRIDAY, THE 16TH JANUARY
1931.

The following were present :—

1. Diwan Bahadur Sir T. VIJAYARAGHAVACHARYA, *Chairman*.
2. Major F. H. BUDDEN.
3. Mr. B. C. BURT.
4. Mr. P. H. CARPENTER.
5. Mr. G. K. DEVADHAR.
6. Mr. R. S. FINLOW.
7. Dr. N. N. GANGULLI.
8. Mr. K. HEWLETT.
9. Mr. G. R. HILSON.
10. Dr. L. K. HYDER.
11. Mr. NIZAMUDDIN HYDER.
12. Dr. B. A. KEEN.
13. Mr. T. F. MAIN.
14. Mr. D. MILNE.
15. Colonel A. OLVER.
16. Mr. F. J. PLYMEN.
17. Mr. W. ROBERTSON-BROWN.
18. Mr. P. T. SAUNDERS.
19. Mr. R. L. SETHI.
20. Mr. W. TAYLOR.

Mr. M. S. A. HYDARI, *Secretary*.

The following attended as visitors :—

1. Dr. S. P. AGHARKAR.
2. Mr. W. T. ALDOUS.
3. Mr. B. A. COLLINS.
4. Dr. W. McRAE.

2. The meeting lasted from 11 A.M. till 5-20 P.M. with an interval for lunch from 1-40 P.M. to 3 P.M.

3. *Production of agricultural cinema films.* (*Subject No 22 of the agenda*) (*Appendix XXIV*).—In introducing the subject Mr. Burt said that he had reckoned roughly that the total cost on account of the pay and travelling allowance of two men in India for six months *plus* the cost of pay for one man who will be deputed to England for 12 months would be at least Rs. 12,000. The question which was for the consideration of the Board was as to what would be the duties of this man and his assistant when the former returned from abroad; and also whether they should

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be under the Council and who would be responsible for their pay. The film officer would have to acquire a thorough knowledge of the production of educational films. The Chairman announced that while in England the Empire Marketing Board had informed him that the Board would pay the cost of passage to England and back *plus* all the incidental expenses of training in England provided the Council bore the charges for the pay of the man deputed. Major Budden said that the Railway Board had had now over three years' experience of film production and he had found it to be a highly technical matter. He did not think that the proposal to lend an officer to provinces would work satisfactorily, as an officer by himself could do little. He must have skilled staff working with him and a place where he could try out and edit his films and it would be advisable to attach him to some existing bureau. If he were attached to the Central Publicity Bureau of the Indian Railways he would be able to make use of their apparatus and existing organisation and would also have the advice and help of the Railway Cinema Expert. As the Railways were greatly interested in the development of agriculture in India they were naturally keen on exploring every possible avenue of co-operation of which the present proposal was one. He also thought that it would be difficult to find a man in India to take up the post on less than Rs. 500 a month. It should be remembered that the man selected should, apart from any training which he might have had or might acquire with the assistance of the Council, have a flare for film production work. The selection of a suitable man would therefore be a matter of some difficulty and he would therefore recommend the appointment of two men on probation of whom the better one would be selected after six months. Mr. Milne said that they in the Punjab wanted highly technical advice from a specialist who would help in drawing out sceneries and edit their films. He acknowledged the assistance which the Railway Board had already given them in the matter of films and advised that the Research Council should collaborate with the Railway Board. Mr. Plymen also supported Major Budden's idea of the Council collaborating with the Railway Board in this matter and of utilising the facilities offered. In answer to the Chairman Major Budden informed him that the total expenditure on the production of films by the Central Publicity Bureau was last year about Rs. 1,75,000. Mr. Collins said that in Hyderabad also they were interested in the production of agricultural cinema films and he had a film on sugarcane under consideration. They did not make their own films but a local company had agreed to do it at the rate of Re. 1 per foot and for duplicates at Re. 1/- per foot. He would like to know whether these rates were reasonable. He also wondered whether the provision of only one man by the Council would really do much good. There would be seasons in the year like the sowing season and harvest time when all provinces would be wanting the Council's film expert. That was a difficulty. Mr. Finlow was for joining in with the Railway Board in this matter. He said that he had found the films made by them for his Department very good. Mr. Milne answering Mr. Collins's difficulty said that it would probably be necessary for a province to have its own cameraman who could take photos at the proper time on the spot, the Expert from the Council helping with the scenario. Major Budden said that he thought that provinces would probably find it too expensive each to have a cameraman of the necessary qualifications for taking films and a possible solution would be to have one or two good cameramen under the Council who could be loaned out to provinces. The work of a cameraman was also highly technical now a-days if good films

were to be produced. The Chairman said that while in England he had had discussions on this subject and he felt doubtful whether it would be possible to train a man in a short period of time, also the position was changing owing to the advent of the talkies. They were in a transitional period and as expenditure on any cinema scheme of the Council would run to far more than a few thousands per annum he thought that it would be advisable to wait. Mr. Devadhar said that while he appreciated the fact that silent films were giving place to talkies he thought that the former could still in India at least play a very useful role as means of instruction. He therefore recommended that a small committee should be formed to collect necessary data and that the matter should not be shelved till some other time. Mr. Main was in favour of Major Budden's proposal and he said that they in Bombay had felt the need for bringing artistry and technique to bear on their agricultural propaganda films. Mr. Hilson said that he was doubtful about the usefulness of cinema for agricultural propaganda. He understood that Java's experience in this respect had not been satisfactory. Film exhibitions were undoubtedly very attractive but their utilitarian value was small. The practice they had adopted in Java was to have a short length of film and use it in place of a lantern slide in the course of instruction. He proposed to try this method in Madras. Short length films were preferable to glass slides as they could be rolled up and took up little space. Dr. Agharkar was not quite convinced about the utilitarian value of film exhibitions. He was doubtful if they brought conviction; that was not surprising as operations covering months were compressed over a short period of time. An unsophisticated villager considered this somewhat unreal. He thought that the Council would be well advised not to embark on such schemes of dubious utility. Mr. Plymen disagreeing said that before a person could be convinced he had to be interested. His idea was not that a film should be left to tell its own story but that when showing the film there should be an agricultural instructor who would give a running lecture as the scenes were projected on the screen. He would thus transform the silent film into a talkie. Major Budden answering some of the points raised in the discussion said that he would not advise engaging a man permanently but on contract. This was the usual commercial practice and was what they were doing in the Central Publicity Bureau. If a film officer could produce six good films per year not exceeding two reels each, he would be doing very good work and this would be as much as the Council would have reason to expect. In regard to the difficulty about one man not being enough to go round all the provinces he thought that some arrangement could be arrived at between his Department and the Council whereby one of his men would be lent to the Council at the busy agricultural season, the Council at the slack times lending its man in return. The railway rate for producing films was Re. 0.8-0 per foot if the buyer bought two films and annas six a foot for duplicate copies. He thought that a local company with low supervision charges should be able to produce straight forward films at Re. 1 per foot as quoted by Mr. Collins but the actual cost of duplicates could not be less than annas four a foot excluding any share of overhead expenses. The average instructional film was of two reels or upto 2,000 feet but they varied from 500 ft. to 4,000 ft. At this stage the Chairman put Mr. Devadhar's resolution which had been tabled previously and seconded by Dr. Hyder to the Board which adopted it. It ran as follows :—

“Considering the great importance and practical utility of cinema films on agricultural and allied subjects as the most effective

means of popular adult education and the general interest in carrying out into effect the most useful and valuable results of the work of research conducted by various workers in the domain of useful agricultural (and veterinary) or livestock improvement and advancement, this Board is of opinion that no time should be lost in getting films manufactured; and for that purpose a sub-committee composed of the representatives of provinces where such attempts have already been made be appointed to make definite proposals to this Council both as regards the subjects to be selected and the best agencies to whom the work be entrusted under the supervision of that sub-committee and the Central Publicity Bureau of the Railway Board; and that a sum not exceeding Rs. 25,000 be provided for the production of four or five films of more than 3,000 to 4,000 feet at rates not exceeding those stipulated or worked by the Central Publicity Bureau."

4. *Testing of Indian agricultural products in England (subject No. 23 of the agenda) (Appendix XXV).*—Noted.

5. *Application from the Government of Madras for a grant for research work on potatoes (subject No. 24 of the agenda) (Appendix XXVI).*—Mr. Hilson introduced the scheme which Mr. Burt supported subject to the provision of Rs. 8,000 for quarters being borne by the Provincial Government. He said that the potato crop was of great and growing importance. The import of European varieties for sowing was chiefly useful in hill tracts as the selection and breeding of potatoes for cultivation in the plains in India presented distinct problems. He was of opinion that just as in the case of sugarcane cultivation the cultivation of potatoes would not progress in India till the breeding and testing of types suitable for Indian conditions was taken up here. All the Directors of Agriculture present supported the scheme with a proviso that the expenditure of Rs. 8,000 for quarters should be met by the local Government. The Chairman suggested that it would be as well to pass the scheme with the above proviso rather than to refer it back to the local Government for an expression of their views in regard to the latter's share of the cost; for if it was approved by the Governing Body the local Government could be approached with a definite proposal that the Council would be willing to finance the scheme (Appendix XXVI) if the local Government on their part bore their reasonable share.

The Board agreed to recommend the scheme subject to the rider suggested by the Chairman.

6. *Participation of India in the International Dairy Congress, Copenhagen, 1931. (Subject No. 25 of the agenda) (Appendix XXVII).*—Colonel Oliver introduced the subject. Mr. Hewlett suggested that one at least of the members of the proposed delegation should be a veterinary officer. He suggested Mr. Kerr's name in the first place and if two veterinary officers were sent he would add Mr. Taylor's also. Mr. Finlay suggested Mr. Gossin. The Chairman said that these suggestions would be considered when the proposal was made to the Governing Body in regard to the composition of the delegation. He thought that probably one delegate would be sent from India. Mr. Devadhar said that in that case he would like this delegate to look to the co-operative dairy activities in Denmark.

The Board recommended that India should participate in the International Dairy Congress, Copenhagen, 1931.

7. *Representation from Kirloskar Bros., in regard to the rates of railway freight charged on agricultural implements.* (Subject No. 26 of the agenda) (Appendix XXVIII).—After Mr. Burt had introduced the subject, Major Budden, the railway representative on the Board, said that he would refer members to his note (Appendix XXVIII) on Messrs. Kirloskar Brothers' representation which had been circulated to the Board. Dr. Hyder said that the present was a time of very acute distress for the agriculturist in India. It was no answer to the cry of the agriculturist to say, as the Railway Board usually said when freights were in question, that the rates were reasonable. In this connection he referred to paragraph 4 of Major Budden's note in which it was stated that Messrs. Kirloskar Brothers' had made no attempt to show that the railway charge for agricultural implements was not reasonable. Dr. Hyder held no brief for this company or for any other and he wanted it to be clearly understood that his remarks were not due to the present representation from Messrs. Kirloskar Brothers, but were actuated by the needs of the situation. The freights on wheat for example were considered "reasonable" before the pressure of public opinion had recently forced the railway authorities to reduce the freight on wheat from Lyallpur to Karachi. The rates would now be held up as reasonable just as the old rates had been! He therefore pleaded for an impartial examination of the position in so far as agricultural products and implements were concerned. He would probably be told that if any representation on railway rates had to be made, it should be made to the Railway Rates Advisory Committee. But he would submit that the Committee as constituted was hardly such as to inspire confidence among the public concerned. They did not want to be told that according to such and such a rule or such and such a principle the rates could not be altered. What they wanted was that the question of the rates should be examined from the point of view of the man who had occasion to send goods by rail and who could reconcile his needs with the duty of the railway administration to run the railways on commercial lines. If the railways helped the agriculturist in the matter of rates, he would in the long run bring more business to them. He therefore recommended that the question of freights affecting agricultural products and implements should be referred to a small committee composed of representatives of the Railway Board and others. Mr. Devadhar and Professor Ganguli supported Dr. Hyder's resolution, the latter inviting a reference to paragraph 316 of the Report of the Royal Commission on Agriculture. Mr. Hilson, speaking in support of Dr. Hyder's resolution, gave an instance of how rates might be reduced to the mutual benefit both of the railways and of the agriculturist. He said that he was importing a large number of Satara ploughs into Madras. The freight on these came to about Re. 1 per plough. If the freight could be reduced by half, he would be able to sell many more ploughs; in this way railway traffic would be increased and the agriculturist also benefited. Mr. Collins also supported Dr. Hyder's resolution. Major Budden in reply assured the Board that railways did realise that they depended upon the prosperity of the Indian agriculturist for their own prosperity; but it should be borne in mind that railways were not philanthropists. Figures such as those given by Mr. Hilson were very helpful to railway administrations which were always willing to examine a position *de novo* and which had nothing to hide. Speaking therefore purely in his personal capacity and not as a representative of the Railway Board he thought that a committee such as that suggested by Dr. Hyder might perhaps do some good and help to

clear up some misunderstandings ; its labours would probably have to be somewhat prolonged as rates were a very intricate question. It should be remembered that railways have to earn enough to pay interest on the capital borrowed and in addition pay a contribution to General Revenues equivalent to another 1 per cent. This necessitated last year borrowing over two crores of rupees from the Reserve Fund and possibly considerably more would be needed this year. If rates were reduced for one class and there was no increase in traffic to make up for reduced earnings then other classes would have to pay more. The Chairman then put Dr. Hyder's resolution to the vote. It ran as follows :—

“ That the Advisory Board of the Imperial Council of Agricultural Research recommends to the Railway Board that a committee composed of representatives of the Railway Board and others be appointed to examine the question of railway freight rates on agricultural products and implements.”

The Board passed this resolution.

8. *Assistance to be given by the Indian Railway Central Publicity Bureau to promoting agricultural and veterinary development.* (Subject No. 27 of the agenda) (Appendix XXIX).—Major Budden introducing the subject said that he would like the views of members of the Advisory Board on the memorandum which he had submitted on the subject and which had been circulated to the Board. Mr. Burt said that by far the greatest help which railways could give to the agriculturist in India was to reduce the freight on agricultural produce. This point had already been dealt with in the resolution passed on subject No. 26 of the agenda ; but he would like to emphasise that Indian agriculture was passing through a very critical time and as a country which had a large export trade in agricultural produce, it was important that at a time when there was over production in the world the agriculturist in India should be assisted as much as possible in the matter of freight to maintain the position of his produce in the markets of the world. Mr. Pymen, as well as the other members of the Advisory Board, said that this question of freights was really the most important direction in which the railways could assist the agriculturist.

Opinion in the Board was divided in regard to the utility of provincial demonstration trains. Though their use had been discontinued in the Punjab and Bengal this year, that was not due to their being considered of little value, but because of financial stringency. Opinion was, however, definitely against the feasibility of running an all-India demonstration train owing to difficulties in regard to language and also because of the difference in varieties of crops grown. Major Budden informed the Board that he had prepared a pamphlet on demonstration trains which would be circulated to all members of the Board. Finally it was agreed to hold over the question of the utility of demonstration trains for consideration at the next meeting of the Advisory Board, so that in the interval members might have the opportunity of reading Major Budden's pamphlet as well as of considering the question further.

Opinion was in favour of the railways encouraging visits of cultivators to model farms, agricultural shows and exhibitions by means of concession tickets. The members of the Board were also in favour of the Directors of Agriculture being members of Provincial Railway Advisory Committees,

which at present had no representative of the Agricultural Department on them. The following suggestions also found favour with the Board :—

- (1) Allowing cows and buffaloes to be transported back from towns to the country at cheap rates when no longer in milk. This would avoid the present slaughter of good milking animals after their period of lactation.
- (2) The establishment of agricultural stalls at railway stations.
- (3) The exhibition and sale of agricultural implements *approved* by the provincial Department of Agriculture at railway stations.
- (4) Provision of improved types of cattle wagons for the transport of cattle. The railway representative, Major Budden, said that there were already special types of ventilated wagons on the railways, but the co-operation of cattle-owners was also necessary. As the amount charged was often for the whole wagon, there was a tendency on the part of cattle consignors to overcrowd the wagon.
- (5) Pictures on agricultural subjects in railway carriages. The railway representative said that they had tried having pictures and advertisements in third class compartments, but they found that these were generally torn up.

In the result the Board took note of Major Budden's suggestions and passed on to the consideration of the next item of the agenda.

9. *Dry-farming research scheme for the Bombay Deccan.* (Subject No. 28 of the agenda) (Appendix XXX).—Mr. Main introducing the subject said that India's greatest agricultural problem was the rainfall; just about one-third of the total area of the Bombay Presidency was very liable to famine. That showed how important the problem of crop growth in areas of scanty rainfall which had been fully stated in the scheme (Appendix XXX) circulated to the Board was to the Bombay Presidency. There were three phenomena of special significance associated with the rainfall in the famine zone. (1) the small total which was round about 20 inches, dropping to 14 inches in some years, (2) the remarkable compression of three-fifths, or 12 inches, of this rainfall within a period of about 10 days, and (3) the huge run-off which amounted to about 50 per cent. of the heavy rain. Hence this scheme might well be given the subtitle of "the better utilization of the rainfall". The reason for the necessity for sub-centres to a main central scheme lay in the fact that this species of research was closely wrapped up with factors of environment such as humidity, wind, moisture, sunshine, etc., which differed from tract to tract. He had no objection to the scheme as modified by the Bombay Government whereby the sub-centre at Ahmedabad was dropped; as a matter of fact, this was not in his original scheme, but had been introduced at the instance of the Provincial Research Committee. Mr. Devadhar supported the scheme. He said that the work already done in the Bombay Deccan on the subject had produced very beneficial results for a particularly needy section of the population. There were other areas in India where rainfall was scanty and not too well distributed and for all these a scheme like the present one would be of great utility. Mr. Sethi said that they had similar problems in the United Provinces and he thought that they should have sub-centres in the United Provinces as well as in the Punjab. Mr. Collins said that the collaboration

of Hyderabad had been invited to this scheme. His Government were very willing to offer all the assistance they could. The conditions of three districts on the western frontier of Hyderabad were similar to those of the districts on the eastern border of the Bombay Presidency. While Hyderabad was not in a position at present to start a new sub-centre, the State was prepared to give all the necessary facilities at the agricultural station recently started at Raichur. His Government had one suggestion to make, which was that an advisory committee of representatives from the areas affected should meet from time to time and discuss problems of common interest; a suggestion which Mr. Main said that he welcomed. Mr. Hilson thought that the better utilisation of rainfall was really the problem. Madras had fourteen centres where the problems which Mr. Main had stated in his note circulated to the Advisory Board were being dealt with. Madras, however, was not unique, as he felt sure other provinces were doing the same. He was therefore of opinion that the Agricultural Expert Adviser to the Council should collect information as to what was being done on the subject in the provinces and indicate the way in which the Imperial Council could assist this research. Mr. Devadhar said that the results obtained from work already done were being applied in some districts in the Deccan. He mentioned that there were 44 centres in the district of Ahmednagar mostly opened by the agriculturists themselves with the advice of the department. In the districts of Poona, Sholapur, and Bijapur there were 5 centres in each and the results at most of these places were very satisfactory. Mr. Plymen said that the problem was one in which his own province would like to join, but that they did need an investigation as to what was being done in other provinces. He was in favour of a committee like the Fertilizers Committee which should not only survey the whole position but which would collate the results of past experiments. Mr. Burt said that as stated by previous speakers, the problem was the condition of crop growth in areas of scanty rainfall; such areas, for example, as had a rainfall below 20 inches per annum most of which fell in a short period of time, say for example 10 days as in certain places in the Bombay Deccan. He conceived the problem as largely a Deccan problem, in which Bombay, Hyderabad, the Ceded Districts of Madras and portions of the Central Provinces were concerned. He was of opinion that the Council should support a scheme in so far as the central station was concerned, but should not provide substations in any of the provinces. He did not think that a better place could be found for a central station than had been proposed, namely, Sholapur. The staff proposed by Mr. Main for the central station was not excessive, but care should be taken that the chief investigator was thoroughly suited for his job as this was essential to the main scheme. Mr. Devadhar supported Mr. Burt and added that in his opinion this was a vital problem for the Deccan. Dr. Hyder said that the Deccan was not the only scanty area to be considered. He instanced the Salt Range in the Punjab. Dr. Keen supported the idea of a committee. While reading through the vast amount of literature which existed on the conservation of soil moisture, he found very little reference to the experiments in India. He therefore felt that past records should be examined and all the necessary information collated as a preliminary. He noticed that in Mr. Main's scheme which was a very sound one, the soil aspect of the problem had been emphasised. The same aspect had been stressed in the sugarcane research scheme in the Bombay Deccan and he considered it rightly so. Mr. Milne supported Mr. Main's scheme (Appendix XXX) but was in favour of the

appointment of a committee which should consider the requirements of barani districts of the Punjab. Dr. Hyder and Mr. Carpenter were both in favour of a committee which should examine such schemes and co-ordinate them somewhat as the Sugar Committee had done with the sugar schemes. At this stage Dr. Keen moved the following resolution :—

It was seconded by Mr. Carpenter.

“ That a committee be formed for the purpose of examining the general, technical and scientific position with reference to farming in areas of limited rainfall and in the first instance to examine the Bombay dry-farming research scheme.”

Mr. Main had no objection to the above resolution which was agreed to by the Board. Selection of members of this committee was left to the Chairman.

10. *Research on the water requirements of crops.* (Subject No. 29 of the agenda) (Appendix XXXI).—After Mr. Milne had explained the scheme the Board decided to refer it to the Committee appointed for subject 28 (Appendix XXX).

Scheme for research on Plant Physiology at the Hindu University, Benares. (Subject No. 35 of the agenda) (Appendix XXXII).—The Board decided to refer this scheme to a committee. The personnel of this committee was left to the Chairman.

11. *Proceedings of the first meeting of the Fertilisers Committee held in June 1930.* (Subject No. 30 of the agenda) (Appendix XXXIII).—Mr. Burt invited the attention of the Board to the statement showing the recommendations made by the Fertilisers Committee at its first meeting held in June 1930. The Board supported the action recommended in regard to the means by which indigenous manures may be cheapened and their use extended. The Board agreed to the recommendations of the Committee in connection with further research in regard to the possibilities of indigenous manures especially to unirrigated tracts and to tracts with defective irrigation facilities. In particular, on the motion of Mr. Plymen, seconded by Mr. Carpenter, the Board recommended that the Council in giving grants should make it a condition that the general principles enunciated by the Committee governing the planning and interpretation of experiments should be followed in respect of all experiments financed as a result of such grants.

12. *Preliminary report on the calorific value of some Indian woods.* (Subject No. 31 of the agenda) (Appendix XXXIV).—Noted.

13. *Arrangements for the examination by specialists of papers for publications in the new Journals and the preparation of a list of referees.* (Subject No. 32 of the agenda) (Appendix XXXV).—Dr. Hyder said that no provision had been made for referees in the subject of Agricultural Economics and recommended that such provision should be made. Mr. Burt said that he agreed that this should be done, but he explained the reason why it had not been done before was that they had never so far received any paper on agricultural economics. The Board recommended on the motion of Mr. Plymen that Dr. Hyder and Mr. Darling should be appointed as referees for papers on Agricultural Economics and Prof. Ganguli should be added to the list of referees on general Agriculture.

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14. *World's Grain Exhibition and Conference, Canada, 1932.* (Subject No. 33 of the agenda) (Appendix XXXVI).—The Board decided that six weeks from hence should be allowed for suggestions from members as to the subjects on which papers should be sent from India to the Conference and the authors who should be invited by the Council to contribute papers.

15. *Revision of the Publications "Dictionary of the Economic Products of India" and "The Commercial Products of India".* (Subject No. 34 of the agenda) (Appendix XXXVII).—In regard to the Dictionary of the Economic Products of India the Board agreed with Mr. Burt that it was very doubtful if a revised edition would be justified. It would cost some two or three lakhs of rupees and as would be the case with all encyclopædias, it would soon be out of date. As regards the Commercial Products of India, the Board recommended on the motion of Mr. Burt that subject to the Council not being involved in any financial liability, a revision of this publication should be undertaken. It would probably be necessary to have one editor with a number of specialists collaborating with him. If the Government of India agreed to such a revision, it was recommended that a sufficient number of copies should be printed so that copies may be available for at least five or six years thereafter. The Board also considered that it would be as well to print parts dealing with plants and animal products separately from the one dealing with mineral products. The desirability of a good index as well as of giving vernacular equivalents accurately was also emphasised.

16. *Rice Research. Proposal for the establishment of a research station in the United Provinces.* (Subject No. 4 (a) of the agenda) (Appendix V).—Mr. Burt moved and Mr. Finlow seconded the adoption of the Report of the Rice Committee. The Board agreed.

17. At the special request of Mr. Collins a scheme (Appendix XXXVIII) submitted by Hyderabad for an extension of research work on castor already being carried out by the State Department of Agriculture so as to add to its utility for other parts of India was circulated to members of the Board. It was decided to postpone consideration of this scheme till the next meeting of the Advisory Board as it had come too late for inclusion in the agenda and Members had had no time to study it.

18. The Chairman in adjourning the Advisory Board, thanked members for the sustained interest which they had shown in the discussion of a heavy agenda and for the valuable advice which they had given. The work which they had accomplished during the five days they had sat would be fruitful of results for which they would be gratefully remembered in time to come.

Mr. Devadhar in moving a vote of thanks to the Chairman, which was unanimously carried, paid a tribute to the tact, patience and sympathy with which he conducted the proceedings.

The proceedings then terminated.

M. S. A. HYDARI.

16th January 1931.

APPENDIX I.

DECISIONS OF THE GOVERNING BODY ON THE RECOMMENDATIONS OF THE ADVISORY BOARD MADE AT ITS MEETING IN JUNE 1930.

- (1) *Extracting, summarising and publishing material on the research and experimental work carried out by the Imperial and Provincial Agricultural Departments in India.*—The proposal for the production of a semi-popular book on the lines of "Research and the Land" reviewing the results of agricultural and veterinary research in India for the past 25 years was approved.
- (2) *Grant for research work on water hyacinth by Professor Parija at Cuttack.*—Sanctioned.
- (3) *Award of prizes and medals for improvements in Agriculture and Animal Husbandry.*—Accepted.
- (4) *Establishment of a sub-station of the Botanical Section of the Pusa Institute at Karnal.*—The scheme as recommended by the Advisory Board but with the addition of Rs. 10,000 for equipment was sanctioned.
- (5) *Appointment of a Research Officer at the Imperial Institute of Veterinary Research to investigate into the condition known as contagious abortion among domestic animals.*—Rejected.
- (6) *Proposal for the appointment of a Protozoologist at the Imperial Institute of Veterinary Research, Muktesar.*—Approved.
- (7) *Appointment of a Research Officer for equine diseases at the Imperial Institute of Veterinary Research.*—Rejected.
- (8) *Appointment of a special officer for the investigation of Tuberculosis and Johne's disease among animals.*—Approved.
- (9) *Financial assistance in aid of the scheme to establish a Veterinary Institute in the Central Provinces.*—The Governing Body accepted the recommendation of the Advisory Board that the proposal as it stood was hardly such as could be considered.
- (10) *Recommendations of the Locust Committee (2nd meeting) (a) Locust research in India, (b) contribution of £500 per annum for 5 years towards the cost of the Empire Scheme of Locust research to be carried out by the Imperial Bureau of Entomology.*—The Governing Body agreed to a unified locust research scheme at a total expenditure not exceeding Rs. 1,76,000. As regards (b), the Governing Body were against the proposed grant on the information before them. The Vice-Chairman of the Council undertook, during his visit to London, to obtain further information on the subject.
- (11) *Contribution to the Imperial Bureau of Entomology.*—The Governing Body decided that a grant not exceeding £100 per annum should be made.
- (12) *Establishment of a Bureau of Agricultural Intelligence in India.*—Accepted subject to detailed estimates of cost being submitted in due course for the Governing Body's sanction.
- (13) *Appointment of a committee to investigate the subject of mechanical cultivation in India.*—Approved subject to the proviso that the personnel of the Committee should be revised by the Hon'ble the Chairman and the Vice-Chairman of the Council to provide for the representation thereon of businessmen and other non-officials interested in mechanical cultivation.
- (14) *Scheme for the establishment of a new branch of Agricultural Meteorology under the Indian Meteorological Department at Poona.*—Sanctioned at a total cost of Rs. 41,000 per annum or Rs. 2,05,000 for 5 years.

(15) *Schemes for rice research in (a) the Central Provinces, (b) Burma, (c) Bihar, (d) Assam, (e) Bengal and (f) Madras.*—The Governing Body accepted in principle the recommendations of the Advisory Board in respect of the schemes; but decided that, before sanctioning estimates of expenditure in detail on any individual scheme, enquiries should be made from the Empire Marketing Board as to what contribution the Board was prepared to make towards these schemes.

(16) *Invitation to the Govt. of India to participate in the World's Grain Exhibition and Conference to be held in the City of Regina in the Province of Saskatchewan (Canada) from the 25th July to 6th August 1932.*—The Governing Body agreed that India should participate in this Exhibition.

(17) *Proposal to set up a Committee to consider the development of the Indian Oil Crushing Industry.*—Approved subject to the proviso that the personnel of the Committee should be revised by the Hon'ble the Chairman and the Vice-Chairman of the Council to provide for the representation thereon of businessmen and other non-officials interested in the oil crushing industry.

(18) *Application for a grant-in-aid for the experiments in the utilization of sewage for manurial purposes by different methods conducted by the Nagpur Sewage Farm.*

(19) *Financial assistance to the National Horse Breeding and Shaw Society of India.*—The Governing Body accepted the recommendation of the Advisory Board that both these applications should be rejected.

(20) *Scheme for research into properties of colloid soil constituents to be carried out by Dr. J. N. Mukherjee, Khaira Professor of Chemistry, University of Calcutta.*—Accepted.

(21) *Scheme for statistical investigations on experimental errors in field trials to be carried out by Mr. P. C. Mahalanobis, Professor, Presidency College, University of Calcutta.*—Accepted.

M. S. A. HYDARI,
Secretary.

Dated 4th December 1930.

APPENDIX II.

LETTER FROM SIR FRANK NOYCE, KT., C.S.I., C.B.E., I.C.S., SECRETARY TO THE GOVERNMENT OF INDIA, DEPARTMENT OF EDUCATION, HEALTH AND LANDS, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, No. 1826-AGRI., DATED SIMLA, THE 6TH SEPTEMBER 1930.

SUBJECT :—*Question of the expansion of the Imperial Institute of Agricultural Research, Pusa, as an educational centre.*

I am directed to invite the attention of the Imperial Council of Agricultural Research to the recommendations made by the Royal Commission on Agriculture in India in paragraphs 60 and 480 of their Report in regard to the expansion of the Pusa Institute as an educational centre and in paragraphs 45 and 551 regarding the formulation of a scheme for research scholarships and also for scholarships for post-graduate training for district work.

2. In paragraph 60 of the Report it was specially recommended that the advice of the Council of Agricultural Research as to the lines on which the present facilities for post-graduate research at Pusa should be expanded should be taken as soon as possible after its constitution. To enable the Council to be in a position to express an opinion on the subject, the Government of India considered it desirable that Provincial Governments should first formulate their views in regard to the recommendations in question and in their letter No. 1215-Agri., dated the 23rd/27th July 1929 (copy of which is enclosed), they accordingly informed the local Governments and Administrations that the Government of India were prepared to accept the view of the Royal Commission that India should become self-sufficient in the matter of higher agricultural training at an early date and that the organisation of the Pusa Institute as a centre of post-graduate study should be proceeded with. They also expressed their willingness to provide all the facilities required as rapidly as financial conditions permitted but added that they were unable to agree with the view of the Royal Commission that whether or not candidates for the New Superior Provincial Agricultural Services take the course of post-graduate study, which they consider an essential qualification for admission to those Services, the organisation of the Pusa Institute as a centre of post-graduate study should be proceeded with. They held the opinion that the extent to which the existing facilities at Pusa should be extended and improved must depend upon the extent to which the Provincial Governments were prepared to make use of the facilities so provided and they asked the latter for a definite indication of their views on this point.

3. The replies from local Governments—copies of which are enclosed—reveal a large measure of agreement with the recommendations of the Royal Commission as modified by the Government of India in their letter of 23rd July 1929, referred to above. It will be seen from these replies that although the majority of local Governments cannot undertake that the completion of a post-graduate course at the Pusa Institute shall be an essential qualification for appointment or promotion to their New Superior Provincial Agricultural Services and few of them are able to give an indication of the number of men whom they will wish to send annually for training at Pusa, there is a general consensus of opinion that the facilities provided at the Pusa Institute will be fully utilised but that the latter will first have to establish its reputation as a centre for post-graduate training. The only dissentient to this view is the Government of Bombay, who think that they will have little or no occasion to send men to Pusa for training.

4. The Government of India consider that, though the information obtained from the local Governments in regard to the extent to which they will make use of the increased facilities provided is not quite as definite as could be wished, their replies furnish sufficient justification for acceptance of the recommendation of the Royal Commission that the Pusa Institute should be made a centre for post-graduate training. The Government of India, have, therefore, decided to accept this recommendation and propose to provide the necessary facilities as rapidly as financial conditions permit. To enable them, however,

to proceed with the matter, they would be glad to have detailed information as to the type of courses which the provinces require and, if possible, to have a definite answer to the following questions :—

- (a) Is definite post-graduate instruction, as distinct from facilities for research work, desired in all the subjects dealt with at the Pusa Research Institute ?
- (b) Is there a need for a special post-graduate course at Pusa designed for future Assistant and Deputy Directors of Agriculture, as distinct from the specialist courses in special branches of agricultural science ? If so, should the special course for Assistant and Deputy Directors be largely in the nature of a refresher course in science and in the technique and interpretation of field experiments designed for men whose initial training has been largely in agricultural colleges and who have had considerable subsequent experience in practical agriculture ?
- (c) What will be the general standard of scientific and technical knowledge which candidates recommended by Provincial Departments of Agriculture will have attained prior to entering on their post-graduate course ?

I am to request that the advice of the Imperial Council of Agricultural Research may be obtained on these points and furnished to the Government of India as early as possible. On receipt of the recommendations of the Council, the Government of India propose to instruct the new Director of the Pusa Research Institute to frame proposals for the reorganisation of that Institute in such a manner as will provide for adequate post-graduate training in agricultural science of the highest type.

5. Another point on which the advice of the Imperial Council of Agricultural Research will be welcomed by the Government of India is the question of the class of students which should be admitted to the Pusa Research Institute for post-graduate training. For the reasons stated in paragraph 2 of their letter No. 1215-Agri., dated the 23rd/27th July 1929, to local Governments referred to before, the Government of India considered that if Pusa is to fulfil its proper function of training the best men available for service in the Imperial and Provincial Agricultural Departments as envisaged by the Royal Commission, the students admitted to it should consist in the main of the following two classes :—

- (a) Men selected on their University or College record and sent to the Pusa Institute with a scholarship with a view to qualifying for a definite appointment or, at any rate, for immediate admission to an Agricultural Department.
- (b) Class II Service men selected with a view to immediate or ultimate promotion to Class I.

It was assumed that private students would either be very few in number or non-existent. It will be seen from the replies of the local Governments that whilst they agree with the classification suggested above there is also general agreement amongst them that while the post-graduate course at the Pusa Research Institute should not be closed to private students, students nominated by local Governments should have preference and should form the majority. Honours graduates of Indian Universities are likely to provide in increasing degree the staff required for research appointments in the provincial agricultural departments and it does not appear desirable to limit the admission to Pusa of such graduates to those, who actually gain scholarships. There also appears no objection to the admission of private students recommended by local Governments who would be likely to obtain suitable employment if they completed the course satisfactorily, provided their academic qualifications were suitable.

6. Finally I am to invite the attention of the Imperial Council of Agricultural Research to the recommendations made by the Royal Commission on Agriculture in paragraphs 45, 549 and 551 of their Report, in connection with the formulation of a scheme for research scholarships and also for scholarships for post-graduate training for district work and to request that early steps may be taken to formulate a scheme in consultation with local Governments and others concerned.

LETTER FROM G. S. BAJPAI, ESQ., C.I.E., C.B.E., I.C.S., SECRETARY TO THE GOVERNMENT OF INDIA, DEPARTMENT OF EDUCATION, HEALTH AND LANDS, TO ALL LOCAL GOVERNMENTS AND ADMINISTRATIONS, No. 1215-AGRI., DATED SIMLA, THE 23RD/27TH JULY 1929.

I am directed to invite attention to the recommendations made by the Royal Commission on Agriculture in India in paragraphs 60 and 480 of their Report in regard to the expansion of Pusa as an educational centre. The Royal Commission consider it essential that India should become self-sufficient in the matter of higher agricultural training at an early date. They are further of opinion that the completion with credit of an approved course of post-graduate study should be regarded as an essential qualification for admission to the New Superior Provincial Agricultural Services, whether for service in the districts or for research work in the agricultural colleges. They hold that, in existing conditions, the only institution in India in which facilities for post-graduate study in all branches of agricultural science can be provided is the Agricultural Research Institute at Pusa. They, therefore, recommend that the organisation of Pusa as a centre of post-graduate study should be proceeded with.

2. The recommendations of the Royal Commission under this head received the unanimous support of the Conference convened at Simla in October last to consider the recommendations of the Commission. The Government of India are prepared to accept them and to provide all the facilities required for higher agricultural training at Pusa as rapidly as financial considerations permit, but they are unable to agree with the view of the Royal Commission that, whether or not candidates for the New Superior Provincial Services take the course of post-graduate study which they consider an essential qualification for admission to those services, the organisation of Pusa as a centre of post-graduate study should be proceeded with. It appears to them that the extent to which the facilities for post-graduate study, which already exist at Pusa, should be extended and improved must depend upon the policy which Provincial Governments decide to adopt in regard to the recruitment of their New Superior Agricultural Services. I am to point out that the fourteen students, who were taking post-graduate courses at Pusa in 1928-29, were, with few exceptions, private students or officers of the Subordinate Agricultural Services, who were taking the courses with a view to bettering their prospects in the Agricultural Departments. The Government of India are inclined to doubt whether it is desirable that men should be permitted or encouraged to go to Pusa for post-graduate training in the vague hope of bettering their prospects, if they already hold a post in a Provincial Agricultural Department, or of securing an appointment in the Department, if they do not. The result must inevitably be a large proportion of disappointments partly because, under the present system, some of the men selected are not really up to the standard required for post-graduate training and partly because appointments are often not immediately available in the branch of agricultural science in which they have specialised. A defect which is inherent in the present system is that there is frequently a lengthy interval between the termination of the Pusa course and the securing of an appointment in an Agricultural Department and that, during this interval, the value of the training given at Pusa rapidly diminishes. It was with a view to the removal of these defects that the Royal Commission, in paragraph 549 of their Report, recommended that Provincial Governments should institute a system of scholarships for candidate for admission to their New Superior

Provincial Agricultural Services similar to that which the Imperial Agricultural Conference of 1927 recommended should be instituted for the new Colonial Scientific Service. These scholarships would be awarded to graduates selected as possessing the kind of qualifications required and should be of sufficient value to maintain the scholar whilst he was obtaining the post-graduate qualifications the Royal Commission indicated as essential. The Royal Commission added that the possibility that a scholar might prove undesirable would have to be faced and that, in such circumstances, the scholarship should be terminated and the expense written off without hesitation. In other words, they anticipated that the post-graduate students at Pusa would be men for whom there were definite openings in the Provincial Departments of Agriculture but that whether appointments were eventually filled by the men designed for them would depend on their work during the period of post-graduate training. Although the Royal Commission held that the completion with credit of an approved course of post-graduate training should be regarded as an essential qualification for admission to the New Superior Provincial Agricultural Services, whether for service in the districts or for research (including teaching) work in the agricultural colleges, they laid down no hard and fast rule as to the stage of his career at which a man should undergo this training. As regards research and teaching work, they definitely contemplated promotion in cases of merit from Class II to Class I appointments and, as regards district work, they held that a considerable number of the vacancies in Class I appointments on the administrative side should be filled by the promotion of Class II officers. In these circumstances, it is clear that if the views of the Royal Commission are accepted and if Pusa as an educational centre is to fulfil its proper function of training the best men available for service in the Imperial and Provincial Agricultural Departments, the students admitted to it for post-graduate training should consist in the main of two classes. The first of these would consist of men selected on their University or college record and sent to Pusa with a scholarship with a view to qualifying for a definite appointment or, at any rate, for immediate admission to an Agricultural Department. The second would consist of Class II men selected with a view to immediate or ultimate promotion to Class I. Private students would either be very few in number or non-existent. The Government of India are of opinion that it is only by the adoption of the system outlined above that Provincial Governments will be placed in a position to frame an estimate of the number of men for whom they will require places reserved at Pusa and that they themselves will be in a position to decide the extent to which the facilities for higher agricultural training at Pusa should be extended and improved. They propose to refer the whole question to the Council of Agricultural Research, as it will be for that body, in pursuance of the recommendations of the Royal Commission in paragraphs 45 and 551 of their Report, to formulate a scheme for research scholarships and also for scholarships for post-graduate training for district work. In order that the Council of Agricultural Research may be able to take up the question at an early date, the Government of India consider it desirable that Provincial Governments should formulate their views in regard to it, with the least possible delay. I am, therefore, to ask that the Government of Madras, etc. ^{you} will be good enough to examine the question in the light of the considerations pointed out in this letter, and to furnish the Government of India with ^{their} _{your} opinion on it as soon as possible.

No. 1216-AGRI.

Copy forwarded to the Agricultural Adviser to the Government of India.

LETTER FROM V. N. MEHTA, ESQ., I.C.S., M.L.C., SECRETARY TO THE GOVERNMENT, UNITED PROVINCES, DEPARTMENT OF AGRICULTURE, NO. 750-A., DATED THE 22ND AUGUST 1929.

With reference to Mr. Bajpai's letter No. 1215-Agri., dated July 23, 1929 (Agri. A., July 1929, No. 87), I am directed to say that this Government will wel-

come the organization of Pusa as a centre of post-graduate study. The proposals made in Mr. Bajpai's letter appear to contemplate that it will be open only to men with definite prospects of employment in the Superior Provincial Agricultural Service, or to men already in Government service. At the present time numbers of Indian students go to England and elsewhere for higher agricultural training, some at their own expense and some with Government scholarships, without any definite promise of employment. This Government understood the Royal Commission's proposal to be that Pusa should be so developed as to attract these, and provide them with the type of instruction which they require, under Indian conditions. The extent to which this could be done would of course depend entirely on whether the teaching and equipment at Pusa was brought up to a standard equivalent or superior to that of the institutions abroad to which they now go, and more in consonance with the requirements of Indian agriculture—an element often lacking in the training of students educated abroad. Its success as a higher training centre must depend on its own merits, and the reputation which it acquires. On that will also depend the extent to which this Government would be prepared to make it the sole training ground for their higher agricultural service, in continuation of the course at the Agricultural College, Cawnpore. The extent to which they can substitute post-graduate training at Pusa for post-graduate training abroad will depend on this, and on the opinion which may be formed of the quality of the training at Pusa by the Provincial Legislative Council. The number of appointments likely to be available will also depend on the attitude of the Provincial Legislative Council to the expansion of the activities of the Department of Agriculture. The Government anticipate at present an annual recruitment to Class I of the Provincial Service of two or three officers per annum for the next five years; but the conditions governing appointments are such that no definite guarantee of employment is given at present to State scholars when these are sent to England, or could be given if these were sent to Pusa. This Government would, therefore, on the whole, prefer that Pusa should organize itself strictly as an institution for giving post-graduate training to a certain number of men deputed by each province in accordance with the number of seats assigned to it. This number will include (a) selected employees of the present provincial agricultural service who may be deputed for further training generally or in special or selected branches, (b) students to whom posts will be guaranteed, if they pass successfully through a special course at Pusa and (c) certain graduates who have been recommended but to whom no guarantee of employment has been made.

LETTER FROM THE HON'BLE MR. A. N. L. CATER, I.C.S., OFFICIATING CHIEF COMMISSIONER, AJMER-MERWARA, No. 434-CC/29, DATED THE 22ND AUGUST 1929.

With reference to letter No. 1215-Agri. dated the 23rd July 1929, from the Government of India in the Department of Education, Health and Lands, I have the honour to state that the system outlined in the letter referred to above seems to me suitable and may be adopted.

LETTER FROM B. K. GOKHALE, ESQ., I.C.S., OFFICIATING SECRETARY TO GOVERNMENT OF BIHAR AND ORISSA, EDUCATION AND DEVELOPMENT DEPARTMENT, No. 650-D.R., DATED THE 5TH SEPTEMBER 1929.

I am directed to say that the Government of Bihar and Orissa in the Ministry of Education agree with the views expressed by the Government of India in Mr. Bajpai's letter No. 1215-Agri. dated the 23rd July 1929, that if Pusa as an educational centre is to fulfil its proper function of training the best men available for service in the Imperial and Provincial Agricultural Departments, the students admitted to it for post-graduate training should consist in the main of two classes. The first class would consist of men selected on their University or College record and sent to Pusa with a scholarship with a view to qualifying for a definite appointment or at any rate, for immediate admission to an L2SICAR.

Agricultural Department. The second would consist of class II men selected with a view to immediate or ultimate promotion to class I. Private students would either be very few in number or non-existent.

2. The local Government consider that one of the most important points to be considered in connection with the framing of a course of studies should be the general standard of Scientific education and agricultural knowledge of probable future applicants. Any men sent from Bihar and Orissa would be science graduate (B. Sc.) selected from the Arts and Science Colleges, taken in as probationers in class II and sent to Pusa after they have spent one or two years on an experimental farm. The local Government have arranged to send two men annually to the Agricultural College at Nagpur and they propose to make the same arrangements at Cawnpore. But unless and until they have an agricultural college of their own, it will not be possible to ensure that all the men sent to Pusa will have taken a degree course in an Agricultural College.

3. The local Government hope that the adoption of this system will ensure their men being properly trained and qualified to carry on efficiently the research, teaching and district work of the Agricultural Department. Considering the very small cadre of the Provincial Agricultural Department, both in class I and class II, and the probable wastage, the local Government expect that they will require an average of only one seat to be reserved annually for their men at Pusa.

4. In pursuance of the recommendations of the Royal Commission in paragraphs 45 and 551 of their Report, the Imperial Council of Agricultural Research will, it is hoped, formulate a scheme for research scholarships and also for scholarships for post-graduate training for district work and arrange to finance these scholarships from their own funds.

LETTER FROM THE HON'BLE SIR NORMAN BOLTON, K.C.I.E., C.S.I., I.C.S., CHIEF COMMISSIONER, N. W. F. PROVINCE, No. 1740-REV. N., DATED NATHIAGALL, THE 21ST SEPTEMBER 1929.

I have the honour to say in reply to your letter No. 1215 Agri., dated the 23rd July 1929, that it is unlikely that it will be possible to send a student oftener than once in ten years from this Province. It seems open to question whether it is more desirable that the post-graduate course should be taken before or after definite appointment to a Provincial Service.

FROM S. V. RAMAMURTY, ESQ., I.C.S., SECRETARY TO THE GOVERNMENT OF MADRAS, DEVELOPMENT DEPARTMENT, No. 2902-111-29-2, DATED FORT ST. GEORGE, THE 10TH OCTOBER 1929.

With reference to Mr. Bajpai's letter No. 1215-Agri., dated 25th July 1929, I am directed to state that the Government are in agreement with the opinion of the Royal Commission that the completion with credit of an approved course of post-graduate study should be regarded as an essential qualification for the new Superior Provincial Service. Under existing conditions the Agricultural colleges in India are not in a position to provide the intensive training which is necessary to fit men to fill the higher posts in the Agricultural Department and it is therefore desirable to have some Institute in India where such training can be provided. This Government consider that though Pusa as at present constituted cannot provide the post-graduate courses which will be required by different Provinces, it can safely be left to the Council of Research so to organize Pusa that it can meet at any rate part of the demand.

2. This Government also consider that it is possible that certain courses which will be required by Provincial Governments cannot be taught satisfactorily at Pusa. For example, a Province may desire an officer to take a post-graduate course in the cultivation of paddy or cotton instead of a general course in Agriculture or plant genetics. Pusa may not be able to teach such courses. Such training should, in the opinion of this Government, be provided in the Provincial

Agricultural Colleges. These courses would, however, be under the aegis of the Pusa Institute and facilities and possibly financial help would have to be provided to enable the Colleges to undertake the work. This aspect of the question will need careful examination by the Council of Research.

3. This Government consider that students deputed to Pusa by Provincial Governments with or without scholarships may be given preference over private students.

4. In conclusion I am to state that the number of students from this Province for whom seats will have to be reserved at Pusa every year will be communicated to the Government of India later on.

FROM A. R. MORRIS, ESQ., I.C.S., SECRETARY TO THE GOVERNMENT OF BURMA,
FOREST DEPARTMENT (MINISTRY OF FORESTS), No. 266-O.29, DATED MAYNO,
THE 5TH OCTOBER 1929.

In reply to your letter No. 1215-Agri. dated the 23rd July 1929, I am directed to say that the Government of Burma (Ministry of Forests) is in agreement with the principle of the recommendation of the Royal Commission on Agriculture that the Agricultural Research Institute at Pusa should be reorganised as a centre of post-graduate study in all branches of agricultural science. If this reorganisation is carried, the Ministry hopes to be able to make use of the facilities offered for post-graduate study, but it regrets that it is unable to make any estimate of the number of officers that are likely to be sent annually from Burma for post-graduate course.

2. The number in any case is likely to be small. At present there are only 14 posts in the Class I Service. The number may be increased but it is impossible to say when the increase will take place or what number of posts will be added to the Service. Moreover the standard of education among students at the Agricultural College at Mandalay is comparatively low, and graduates of that College even if they underwent a post-graduate course at Pusa would not ordinarily be fit for direct appointment to the Class I Service. It is true that every now and then if there are impending vacancies in the posts of Agricultural Chemist, Botanist or Mycologist, it may be possible provisionally to select for the vacancies an exceptionally brilliant honours graduate from the Rangoon University and to send him for post-graduate training to Pusa. But the Ministry anticipates that it may be necessary to fill for sometime to come the majority of vacancies for direct recruits in the Class I Service by recruitment in England, and such recruits will ordinarily take post-graduate courses in England. The rules however provide that 20 per cent. of the posts in the Class I Service should be filled by promotion from the Class II Service and the Local Government has considered whether a post-graduate training should not be an essential pre-requisite to such promotion. But the Director of Agriculture points out that generally speaking the posts of Deputy Director will be filled by promotion of this kind and that the men selected for promotion will be men who have earned promotion by long experience and knowledge of district work. He doubts whether post-graduate training would be useful, for such men, and the Local Government is disposed to agree. It is not aware that special courses of study could suitably be arranged for officers who will be employed in district work. But the point is one which will no doubt be considered by the Council of Agricultural Research, and the Local Government is willing to reserve its final opinion.

3. The position of the Governor of Burma acting with his Ministers therefore is that while it is in sympathy with the recommendation of the Royal Commission, he does not think that he will be able to make very much use of the proposed post-graduate courses and he is quite unable to frame any estimate of the number of students likely to be sent from Burma.

FROM F. K. KHAN, ESQ., B.A., LL.B., UNDER SECRETARY TO GOVERNMENT,
CENTRAL PROVINCES, No. 792-530-XIV, DATED NAGPUR, THE 17TH OCTOBER
1929.

I am directed by the Government of the Central Provinces (Ministry of Agriculture) to refer to Mr. Bajpai's letter No. 1215-Agri, dated the 23rd July 1929, inviting the views of the Central Provinces Government on the extent to which the facilities for higher agricultural training at Pusa should be extended and improved.

2. In reply I am to say that this Government is in sympathy with the view that India should become self-sufficient in the matter of higher agricultural training but it agrees that the extent to which the facilities for post-graduate study, which already exist at Pusa, should be extended and improved must depend upon the policy adopted by provincial Governments in regard to the recruitment of their new superior agricultural services. With reference to this aspect of the case, this Government entirely accepts the view that it is not desirable that candidates should be permitted or encouraged to enter Pusa for post-graduate training unless they have a definite appointment waiting for them at the conclusion of their course. Thus the students ordinarily admissible for post-graduate training at Pusa would be confined to two classes, namely—

- (1) candidates selected for, and sent with, scholarships with a view to qualifying for a definite appointment in the agricultural department, and
- (2) officers of the lower branch of the provincial service who have been selected with a view to immediate or ultimate promotion to the superior service.

3. As regards the estimate of the number of places which this Government would require to be reserved for its candidates at Pusa, I am to say that this Government has in the past deputed a few officers to Pusa for training in chemistry, bacteriology, entomology and botany, and it will continue to depute officers for this training in future. Also, while Pusa is not likely to be in a position to offer training in what may be termed the 'extension' and 'district work' of provincial agricultural departments, it considers that the agricultural research institute could profitably assist in the training of candidates for the agricultural service by providing post-graduate courses in economics, agricultural statistics and modern experimental methods, and this Government would be prepared to take full advantage of such assistance. There is, however, considerable difficulty in framing any definite estimate of the demands it is likely to make on the facilities available at Pusa. It is realised that unless recruitment to the superior agricultural services is practically confined to men trained at Pusa, there may be less justification for providing the expensive staff and equipment required for training the comparatively few men to be recruited in the superior agricultural services, and the question may arise whether the limited number of botanists, chemists and similar experts required could not be secured equally satisfactorily and at less cost by awarding scholarships to selected candidates for training in existing institutions abroad. While full allowance is made for this consideration, this Government would prefer not to confine its recruitment to men trained at Pusa, so as to exclude altogether candidates who have obtained their training in the required subjects at their own expense and who are fully qualified for its service, though other things being equal it would be prepared to give preference to locally trained candidates. At the same time the number of candidates to be recruited and for whom training may be required depends on the rate of development of the department, which in its turn is determined by financial circumstances over which the department has no control. In view of the above considerations this Government regrets that it is unable at this stage to frame any definite estimate of the number of candidates it would be likely to depute for training at Pusa in the event of the facilities at the institute being extended to meet all the requirements for the training of candidates for the superior branch of its agricultural department.

LETTER FROM J. W. SMYTH, Esq., I.C.S., SECRETARY TO THE GOVERNMENT OF BOMBAY, RE. REVENUE DEPARTMENT, No. 3159-A.28, DATED BOMBAY CASTLE, THE 23RD OCTOBER 1929.

With reference to Mr. Bajpai's letter No. 1215-Agri., dated the 23rd July 1929, I am directed by the Government of Bombay (Transferred Departments) to state that they endorse the view expressed in paragraph 28 of the Royal Commission on Agriculture in India regarding the utility of Pusa as a centre of higher education in Agriculture. They, however, consider that Pusa cannot compete with overseas institutions for post graduate training. In this Presidency so far no difficulty has been experienced in securing overseas trained men for service in the Agricultural Department. The number of men prepared to go abroad for higher training at their own expense is also increasing. During the course of this year two graduates of the Poona Agricultural College have returned from abroad with overseas qualifications, and two members of the Bombay Agricultural Department have proceeded to Europe for further study. Considering the small number of appointments that fall vacant in the Bombay Agricultural Service the Government of Bombay feel that they will have little or no occasion to send men to Pusa for training. This being the case, they cannot endorse the policy of the development of Pusa as a post graduate institution, even though this proposal has behind it the support of the Agricultural Commission.

LETTER FROM LIETTENANT-COLONEL C. T. C. PLOWDEN, I.A., SECRETARY OF THE HON'BLE THE AGENT TO THE GOVERNOR-GENERAL IN BALUCHISTAN, No. 5846-R., DATED QUETTA, THE 4TH NOVEMBER 1929.

With reference to your letter No. 1215-Agri., dated the 23rd July 1929 and subsequent reminder, I am directed to state that the views of this Administration will be submitted as soon as an agricultural officer is appointed in this province, vide my letter No. 5001-R., dated the 24th September 1929.

LETTER FROM H. G. DENNEHY, Esq., I.C.S., SECRETARY TO THE GOVERNMENT OF ASSAM IN THE TRANSFERRED DEPARTMENTS, EDUCATION DEPARTMENT, No. 2326-E., DATED SHILLONG, THE 5TH NOVEMBER 1929.

I am directed to refer to your letter No. 1215-Agri., dated the 23rd July 1929, and to say that the Government of Assam have not yet formulated a scheme for the development of the agricultural department or come to any conclusions about the organization of the new superior provincial agricultural service. They regret therefore that it is not possible at present to state the policy which they would adopt as regards recruitment, or to reply to the specific points detailed by the Government of India.

LETTER FROM S. V. RAMAMURTI, Esq., I.C.S., M.L.C., SECRETARY TO THE GOVERNMENT OF MADRAS, DEVELOPMENT DEPARTMENT, No. 2902-III/29-3, DATED FORT ST. GEORGE, THE 12TH NOVEMBER 1929.

In continuation of paragraph 4 of my letter No. 2902-III/29-2, dated the 10th October 1929, I am directed to state that this Government are not in a position at present to say how many men they will be able to send to Pusa in future years.

LETTER FROM THE HON'BLE SIR JOHN THOMPSON, K.C.I.E., C.S.I., I.C.S., CHIEF COMMISSIONER, DELHI, No. 9956-R. & A., DATED DELHI, THE 22ND NOVEMBER 1929.

In reply to Mr. Rahim's letter No. 2015-Agri., dated the 13th November 1929, I have the honour to say that the proposals contained in Mr. Bajpai's letter No. 1215-Agri., dated the 23rd July 1929, involved the question of selecting

men for training at Pusa. The selection would be made from two sources, (1) from those already in service and (2) from University graduates. The first of these would not concern this Administration, which has no Agricultural Service of its own and consequently depends on officers borrowed from the Punjab. As regards the second class, as candidates from this small Province are not likely to be many, I have made enquiries from the Government of the Punjab as to whether that Government will be willing to include candidates from Delhi in any scheme drawn up by them.

I await their reply.

LETTER FROM G. P. HOGG, ESQ., M.A., I.C.S., SECRETARY TO THE GOVERNMENT OF BENGAL, AGRICULTURE AND INDUSTRIES DEPARTMENT, No. 5916, DATED CALCUTTA, THE 10/11TH DECEMBER 1929.

I am directed to refer to Mr. Bajpai's letter No. 1215-Agri., dated the 23rd July 1929. The Government of India propose to refer the whole question to the Council of Agricultural Research. In the meantime they desire to have the opinion of the local Governments in regard to it.

2. In reply, I am to say that the Government of Bengal are in general agreement with the opinion of the Royal Commission on Agriculture that the completion with credit of an approved course of post-graduate study should be regarded as an essential qualification for admission to the New Superior Provincial Agricultural Services, and that, in existing conditions, the only institution in India in which facilities for such post-graduate study can be provided is the Agriculture Research Institute at Pusa. At the same time they concur in the view of the Government of India that it is not desirable to permit or encourage officers of the subordinate agricultural services or private students to go to Pusa for post-graduate training in the vague hope of bettering their prospects or of securing an appointment in the department. This Government accordingly accept the view that the better course would be to send selected students with scholarships to Pusa, up to the number for whom there are definite openings in the department. The actual appointment would, of course, depend on the quality of work done during the period of post graduate training. In the case of officers whom it is proposed to promote from lower cadres, this Government would also arrange to depute them to Pusa for a post-graduate course.

3. As regards estimate of the number of men for whom places should be reserved at Pusa under the proposed system of recruitment, I am to say that it is not feasible at the present stage to furnish any estimate of average normal requirements of this province in the future. Much will depend upon the degree of expansion of the provincial Agriculture Department. The probable number of vacancies within the next few years will be very small. It is not, therefore, possible to put down a definite figure.

LETTER FROM MAJOR G. LOCH, I.A., SECRETARY TO THE CHIEF COMMISSIONER OF COORG, No. 441/48-23 (1), DATED BANGALORE, THE 3RD FEBRUARY 1930.

I am directed to refer to your letter No. 2362-Agri., dated the 24th December 1929, and to say that the Chief Commissioner is not yet in a position to give a definite reply to Mr. Bajpai's letter No. 1215-Agri., dated the 23rd July 1929, though he recognizes that the question is one of the first importance to the Province and it is under active discussion with the Commissioner of Coorg.

2. I am, however, to explain some of the difficulties with which the Province of Coorg is faced. The Province is small and its financial means are very limited; on the other hand its resources lie entirely in the land, that is to say, in planting (mostly rice and coffee) and forestry, while animal husbandry calls urgently for attention.

The Province cannot by itself afford an Agricultural Service, but there are disadvantages, financial, technical and administrative, in borrowing officers either from the Government of India or Government of Madras.

But in any case the Province is unlikely to be able to afford more than a single officer of comparatively low rank, so that its needs will hardly affect any decision that the Government of India may come to regarding the expansion of Pusa as an educational centre.

LETTER FROM A. C. MACNABB, Esq., I.C.S., SENIOR SECRETARY TO THE FINANCIAL COMMISSIONER, AND DEPUTY SECRETARY TO GOVERNMENT, PUNJAB, DEVELOPMENT DEPARTMENT, No. 1492-D., DATED LAHORE, THE 9TH APRIL 1930.

With reference to the correspondence ending with your letter No. 2369-Agri., dated the 24th December 1929, I am directed by the Punjab Government (Ministry of Agriculture) to intimate that in the draft rules for the new Class I Agricultural Service, experience of research work has been entered as one of the qualifications for administrative posts, while for research posts the qualification proposed is as follows:—

“recruitment will be made from amongst candidates who possess a University degree with honours or other similar qualification in the special science concerned, and preference will ordinarily be given to those who have spent at least two years in research work under a scientist of established reputation, and have studied the science from an agricultural point of view.”

In this rule, however, no special mention is made of Pusa, as so many candidates from India now proceed to England for training, and the Punjab Government does not propose to exclude these entirely. But it will be clear that if Pusa provides facilities for training in research it should become the chief training ground for candidates educated in India.

2. The appointments are to be made (both direct and by promotion from class II) on the advice of either the Public Services Commission of the Government of India, or of a provincial Commission, if one is constituted; so that it will be for this body to decide whether it will accept training in research at any other place in India except Pusa as a qualification under the rule.

3. It will be seen that if a member of the class II service aims at promotion to a research post in class I he will have to undergo at least two years in research work to qualify.

4. Of the officers in the department, many have done post-graduate work in various institutions, of whom four have worked at Pusa and five at Bangalore, so that the staff in this province have shown willingness to profit from the facilities afforded by the Government of India, and if these facilities are extended as proposed it may confidently be anticipated that yet more use will be made of them.

LETTER FROM J. N. G. JOHNSON, Esq., C.I.E., I.C.S., OFFICIATING CHIEF COMMISSIONER, DELHI, No. 4911 R. & A., DATED DELHI, THE 27TH MAY 1930.

In continuation of my predecessor's letter No. 9956-R. & A., dated the 22nd November 1929, I have the honour to refer to letter No. 1492-D., dated the 9th April 1930, from the Senior Secretary to the Financial Commissioners and Deputy Secretary to Government, Punjab, Development Department, to the Under Secretary to the Government of India, Department of Education, Health and Lands, and to say that for the reasons indicated in Sir John Thompson's letter No. 9956-R. & A., dated the 22nd November 1929, the decision of the Punjab Government will be accepted by this Administration, which depends on the Punjab for its agricultural staff. Candidates from this Administration would enter the Punjab Agricultural Service and would have to comply with the requirements in force in the Punjab; and therefore the conditions which are accepted by the Punjab should apply to candidates from Delhi.

APPENDIX III.

The Minutes of the first meeting of the Committee appointed to consider the Pusa Training Prospectus held on the 12th February 1922, the Agricultural Adviser presiding.

PRESENT :

Messrs. Howard, Harrison, Hutchinson, Henderson, McRae, Fletcher, Mann, Clouston, Sampson, Dobbs, Evans, Coleman, Townsend, Parr and Clague and Burt (Secretary)

The prospectus of the Agricultural Research Institute and College as drafted two years ago was laid before the meeting as also a note on "Post-graduate training in Agriculture" by Mr. and Mrs. Howard.

The Agricultural Adviser in introducing the subject said that the Committee would continue on Wednesday, if necessary. The Government of India had decided on a course of training at Pusa to qualify for appointment to the Indian Agricultural Service. The present syllabus has been drawn up by his predecessor and the Government of India had directed that the syllabus should be considered by a Sub-Committee of the Board of Agriculture. He referred to the representative character of the Committee and the number of its members who had at some time been themselves Deputy Directors of Agriculture.

He considered that it would be better to start by considering the course of training required and then proceed to draw up a scheme and rough syllabus.

The object was to provide a substitute for the sending to England of Indians for training prior to appointment to the I. A. S. It was therefore essential that we should give an opportunity for students to get at Pusa as good a training as in England and they must be able to compete successfully with the latter at the end of their training.

He proposed that they should first consider the training necessary for the Deputy Directors of the future as this was the most difficult to arrange. The training of specialists was less difficult as they could be attached to the various sections.

The President then asked for the views of the different members of the Committee as to the kind of training necessary.

In reply to a question from Dr. Mann the President stated that this was a definite scheme for providing men for the I. A. S.

Mr. Sampson inquired whether provision would be made for the training of men already in a Provincial Agricultural Service as well as the men recruited direct from colleges, to which the Chairman replied that provision for such men would be made.

Mr. Townsend inquired if properly qualified private students would be admitted and was informed that this would depend on the number of vacancies in the course.

Further discussion elicited the fact that in most provinces it was anticipated that appointments to the I. A. S. would largely be made from men who had already proved their capability in the provincial agricultural service rather than by direct recruitment from Provincial Agricultural Colleges, followed by a special course at Pusa.

Mr. Sampson enquired as to what would happen in the case of men who had gone to England for training at their own risk and not been selected for the I. A. S. by the Secretary of State. He pointed out that there are already a number of such men in the country seeking employment.

Mr. Clouston enquired as to whether the Selection Committee for candidates to be recommended to the Secretary of State for the I. A. S. would continue and whether this would not meet Mr. Sampson's point. Mr. Howard pointed out that responsibility for the appointments in future might rest more with local Governments rather than the Selection Board. The Chairman pointed out that if a local Government recommended one of its officers for promotion to a post in the I. A. S. the Government of India would invariably send that recommendation to the Secretary of State with their own opinion. The Agricultural Adviser also pointed out that for the Imperial Agricultural Service men must be selected who would be suitable for transfer from one province to another. It was, therefore, necessary that any course of training should be of a high standard. Dr. Mann stated that in future the Bombay Government would probably not appoint men to the Indian Agricultural Service (as Deputy Directors) unless they had already had long service. Direct appointment after a college course followed by a special course would not suit Bombay.

In reply to a question by Dr. Parr it was agreed that students who pass the Pusa Course would probably have to enter the Provincial Agricultural Service in a province in the first place.

Mr. Dobbs pointed out that the present prospectus was really a relic of the proposal to provide for direct recruitment to the I. A. S. Dr. Mann pointed out that the course required at Pusa was apparently primarily a course to qualify men for Provincial Agricultural Services. Dr. Parr pointed out that the Provincial Agricultural Service was largely recruited from the subordinate Agricultural Service and hence Dr. Mann's proposal involved providing that men who originally entered the subordinate agricultural service from provincial colleges would have an opportunity of working their way up to the Indian Agricultural Service.

Mr. Clouston pointed out that the Government of India some time ago asked all provinces to improve the standard of their agricultural colleges so as to enable them to teach up to the standard necessary for direct appointment to a Provincial Agricultural Service.

Mr. Sampson pointed out that men who started in the subordinate agricultural service and whom it might be subsequently wished to promote to the Provincial Agricultural Service were frequently lacking in initiative and authority. A course of higher training would help to correct this. Dr. Mann stated that he was in favour of sending his best Subordinate Agricultural Service men to Pusa for training for their Provincial Service, but he would not send any man straight from college.

The Agricultural Adviser pointed out that the meeting seemed to be agreed that they were opposed to direct appointment to the Indian Agricultural Service (as Deputy Directors) of men trained in India, and that except in very special cases all appointments should be by promotion from the provincial agricultural services. Dr. Mann stated that what the Bombay Government really required was a strong provincial service to enable them to gradually do without an Imperial Agricultural Service.

Dr. Parr and Mr. Sampson pointed out that the Secretary of State might still appoint direct Indians who have gone to England for training. It was suggested in discussion that this could be met by insisting on such men being sent to Pusa for a course in Tropical agriculture. Mr. Evans pointed out the danger of parochialism as some provinces were very backward. Dr. Coleman agreed that higher appointments should be filled by the promotion of experienced men. Mr. Townsend agreed in general with the opinions expressed, but wished to emphasise that the Selection Board at Pusa was a useful body in maintaining a general standard.

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The Agricultural Adviser pointed out that the meeting seemed to agree that "it is desirable that posts of Deputy Directors should be filled, if possible, from men who have already served the Department in India. Students returning from England should be required to take a course in tropical agriculture at Pusa".

Dr. Parr thought they could not exclude the Secretary of State's selections.

The Agricultural Adviser explained the present procedure when a post in the Imperial Agricultural Service is to be filled. Enquiry has first to be made in India if a suitable officer is available before the Secretary of State is asked to take steps to fill the appointment from England. Mr. Sampson and Dr. Coleman pointed out that the requirement that officers appointed by the Secretary of State to take a course of tropical agriculture at Pusa might necessitate a change in the probationary period. Dr. Parr was not in favour of interfering with the present method of recruitment from England, but for recruitment in India utilise the Pusa course. He considered that men appointed by the Secretary of State in England would frequently be best sent direct to a province.

Dr. Mann and Mr. Clouston also expressed a preference for men trained in England being sent direct to the province in which they have to serve.

Mr. Dobbs suggested that the course at Pusa should be made permissive for men recruited in England. Mr. Sampson disagreed, as Indians trained in England often came out without real training in practical agriculture. It was finally agreed that for students trained in England a course in tropical agriculture at Pusa on arrival should be permissive at the option of the local Government concerned. As amended the Committee's resolution read:—

"It is desirable that posts of Deputy Directors should be filled, if possible, from men who have already served the Department in India. Officers appointed from England direct might be required to take a course in tropical agriculture at Pusa during their probationary period".

The Committee then passed on to the consideration of the course of training required. The Agricultural Adviser said that there seemed to be agreement that it was necessary to frame a course suited to a man who was a graduate of a provincial agricultural college and who had proved a success in the subordinate agricultural service (either as a farm Manager or District officer) whom the provincial Director proposed to select for the gazetted service. Dr. Mann agreed.

Mr. Evans thought it necessary that such men should come to Pusa before they were 30 years of age. This would give them 5 to 6 years in the subordinate agricultural service. Mr. Townsend agreed.

Dr. Mann said that in his opinion the Deputy Directors of the future would be largely propagandists. Dr. Parr and Mr. Evans disagreed as they considered that he would have much experimental work to do. Dr. Mann said that to his mind the principal object should be to widen the man's view of the possibilities of improvement.

Mr. Sampson and the Agricultural Adviser pointed out that the improved status of a man who had been through a higher course of training was of administrative importance. Mr. Clouston said that experimental work was essential to successful propaganda. Dr. Parr wished to emphasise the importance of the experimental side. Dr. Mann said he thought it was sufficient if they could ensure men being good farmers. After further discussion it was agreed that men were required who had enjoyed a better training, more specialised on definite lines and with a wider outlook. Dr. Parr pointed out that what was wanted was men thoroughly experienced in the principles of experimental work and capable of taking up independent lines of work on their own. This was accepted. Mr. Evans said that it was essential that men should be taught to appreciate exact experimental methods. This was accepted.

Mr. Clouston emphasised that Pusa could give facilities not available in provinces for a further study of crop improvement, agricultural machinery and breeding.

Mr. Townsend thought it should be made clear that the course proposed would be for men whom it may be proposed to promote from the subordinate to the provincial agricultural service but who eventually might be destined for the Imperial Service. Dr. Mann pointed out that the Pusa course should be a hallmark for men applying for promotion to the Imperial Service.

After discussion the Committee endorsed the recommendation of page (2) of the draft prospectus amended to read as follows :—

"Agriculture.—The aim is to provide for a general post-graduate course of the highest possible standard in Indian and tropical agriculture. Except in very special cases the only candidates who will be admitted to these courses are students who have passed creditably through a full course in a provincial agricultural college. All students must have been recommended by the local Government as suitable for further post-graduate training".

Mr. Dobbs pointed out that Bihar had now no college and that they proposed to take science graduates, employ them as Farm Overseers and Farm Managers and then promote them to the Provincial Service. He enquired if such men would be admitted to the Pusa course.

The Agricultural Adviser said that a definite undertaking could not be given. It might be possible to try one or two men of this class and see if they could follow the work of the course, but possibly the solution of Mr. Dobbs' difficulty would be to send men to an agricultural college in another province.

Mr. Henderson emphasised the necessity of adequate physique in men recruited for training in practical agriculture. It was decided that this could be left to the Local Governments.

LENGTH OF THE COURSE.

It was agreed that the proposed course of two years was too long and that one year was possibly the maximum for which Local Governments would be prepared to send their men. Mr. Sampson pointed out that the students admitted would all have passed a college course of University standing.

Dr. Mann stated that Bombay experience of sending men to England was that it was inadvisable to send young men for a long course and they were now sending older men for one year for training on definite lines.

In reply to questions the Agricultural Adviser explained that as regards dairying Mr. Smith (the Imperial Dairy Expert) expected that there would be dairy schools at work shortly.

It was agreed that the length of the course should be one year. Students sent by provinces would ordinarily be on deputation and it was desirable that there should be uniformity in respect to any extra allowances paid to them over and above their ordinary pay.

SCHEME OF TRAINING.

Dr. Mann disagreed with the proposed syllabus and said that he thought they should consider the question as falling into two principal subjects, (1) Plant Industry, (2) Animal Husbandry; each treated as a whole. The officers in charge of these sides of the work at Pusa should decide what definite piece of work a man sent for training should take up. He emphasised the necessity for men of the class which he proposed to send being allotted a definite piece of work. He did not want a course involving a number of lectures and demonstrations by various sections.

Mr. Townsend did not consider any general course necessary with the possible exception of mechanics.

Dr. Mann emphasised that Pusa should have two definite sides, one devoted to Plant Industry and the other to Animal Husbandry and that men sent to Pusa for training should be put to work on a special problem under the direction of one officer. Mr. Evans thought that the training should be more general. Mr. Howard drew attention to the note which he had circulated which largely met Dr. Mann's point. Dr. Parr considered that in a few years' time Deputy Directors will have very little botanical work or plant selection work to do as the provinces would have Crop Specialists working on all the important crops. He thought that a specialised course as laid down in section (6) of the draft syllabus would meet the case. He thought that Deputy Directors in future should specialise on soils and their management; in some provinces they were now arriving at a point where the cultivation of new varieties could not be taken up without soil study. Mr. Howard thought that Dr. Parr's point was covered by his note and that physiological work such as root studies would meet the point.

Mr. Dobbs pointed out that soils presented an essentially local problem. Mr. Sampson stated that practical work on a farm was required. It was necessary to make their men farmers. The province sending men for training should decide as to what special subjects their men should be trained in as each province had its own problems. He thought that the training required would be covered by work on plant breeding or agricultural botany plus section (6) of the draft prospectus. Mr. Evans thought that they had to train Deputy Directors who would be connecting links between specialists and the public. Dr. Parr emphasised that original work by Deputy Directors would be necessary for many years to come. Mr. Fletcher urged the necessity for refresher courses. Dr. Mann again urged the necessity of men being put on to study special problems. He did not want lecture course.

The Agricultural Adviser in reply to a question said that the appointments of an Agronomist and an Agricultural Engineer had been sanctioned.

Mr. Townsend thought that a general course was desirable combined with a study of special problems as suggested by Dr. Mann. He emphasised the importance of the sub-section on Farm Management and Accounts. A number of members did not agree that there was any necessity to teach farm accounts at Pusa.

Dr. Coleman agreed with Mr. Evans, he emphasised the importance of sub-section 2 of section (6) of the draft prospectus. He entirely disagreed with Mr. Fletcher's proposal for refresher courses. Mr. Clonston suggested that sections 2 and 6 of the draft prospectus would meet their requirements section 2 being taken to mean plant industry and not a course of lectures in agricultural botany. Dr. Parr stated that he would particularly emphasise sub-sections (i) and (ii), i.e., Soils and Manures and the Technique of agricultural experiments.

It was agreed that a preliminary year on the farm was unnecessary and that students should proceed direct to the special courses. Mr. Sampson pointed out that the various sub-sections in (6) i.e., (i) soils and manures, (ii) technique of agricultural experiments, (iii) Farm equipment, (iv) Farm Management and accounts, (v) livestock, (vi) Prime movers, implements and machinery should be optional. A man should not be expected to take them all. Personally he thought it would be sufficient if a man took Agricultural Botany and sub-sections (i), (2) and (4) and possibly (5) of section (6).

Dr. Parr stated that he doubted whether it would be possible to arrange for men to study special subjects without arranging some kind of course. Dr. Mann again emphasised that he did not want to send men for courses of lectures. He did not object to occasional lectures provided they were very good.

Mr. Sampson enquired whether it would be possible to provide for work on Agricultural Economics. Mr. Evans agreed as to the importance of economics with particular reference to agricultural co-operation. The opinion of the Committee was that men competent to conduct a course in agricultural economics were not available in India.

Mr. Dobbs said that of the courses proposed under sections (2) and (6) practically everything except sub-section (vi) (Prime movers, implements and machinery) would have already been learnt in the provinces. He was in favour of training men in special subjects. He thought a general course would be of very little use.

The provincial representatives agreed that the proposed lecture courses in Agricultural Chemistry, Mycology, Entomology, and Bacteriology were unnecessary. It was decided that as the requirements of the various provinces differed widely the Committee should adjourn until Wednesday to enable members to discuss the matter informally in the meantime.

As regards the length of the course, Mr. Henderson asked the Committee to consider whether it would be possible to compromise on an 18 months' course so as to include a complete cycle of operations on the farm and a complete six months' for plant industry work.

The Committee then adjourned until Wednesday, February 15th, at 2 P.M.

The Minutes of the 2nd meeting of the Committee appointed to consider Pusa Teaching Prospectus held on February 15th at 2 P.M., the Agricultural Adviser presiding.

PRESENT :

Messrs. Howard, Hutchinson, Harrison, Henderson, McRae, Fletcher, Mann, Clouston, Sampson, Dobbs, Evans, Coleman, Townsend, Parr, Clague, A. G. Birt and Burt (Secretary).

Mr. Sampson at the request of the President laid a proposal before the meeting that men should start with a training in Farm Management including "Animal Husbandry" under the Imperial Agriculturist and that after six months the course should be divided so as to suit the needs of the different provinces. Students would then either continue Farm Management and Animal Husbandry or would take up a six months' course of Plant Industry or a six months' course of Agricultural Engineering and Agricultural Machinery. In the case of a man who wished to take both Plant Industry and Agricultural Engineering arrangements would have to be made either to extend his training to 18 months or to depute him again later.

In answer to a question by Mr. Clouston it was explained that all the Pusa experts would assist in teaching the courses.

A question was raised whether students should be accepted direct from Provincial Agricultural Colleges or whether previous experience on provincial farms should be insisted on. It was agreed—

"That a minimum of two years' experience on a Provincial Farm, after leaving the College, was essential before a student took up the Pusa course".

Dr. Parr asked for details of the Plant Industry course and Dr. Coleman of the Farm Management and Animal Husbandry courses.

Mr. Sampson said that his idea was that a student would be attached to the Imperial Agricultural section to be trained in practical work including definite instruction, but not necessarily the lectures. Mr. Howard said that he proposed to take Crops as a subject including the growing of crops, Plant selection, testing of varieties and seed production.

Messrs. Henderson and A. G. Birt emphasized the advantage of a full year on the farm before taking up Plant Industry.

Mr. Howard said that he would have no objection. Dr. Parr said that he would make the bifurcation optional, i.e., he would leave each province to itself if the students were to study six months longer and take Plant Industry course.

Mr. Dobbs said that he would be more inclined to omit the general farm course and attach more importance to Plant Industry. Dr. Mann agreed with Mr. Dobbs.

The Agricultural Adviser said that perhaps the Farm Management course must be optional for the first six months, owing to the three special divisions—

- (1) Plant Industry,
- (2) Agricultural Engineering,
- (3) Animal Husbandry,

and suggested that any province might choose any of the three subjects for their students.

Dr. Coleman and Dr. Parr said that they would like to be clear that the rest of the Pusa staff would co-operate, as for example, by giving a certain number of lectures on soils, and manures. Mr. Dobbs suggested a division in the four subjects. In the first six months a student would take up Farm Management or Plant Industry; in the second six months either Agricultural Engineering or Animal Husbandry.

Mr. Sampson said that the Farm Management should be compulsory.

Dr. Parr suggested that what was required was a full year's course of the highest possible standard on the lines of Section 6 of the draft Prospectus, Plant Industry to follow this and be optional.

Mr. Clouston attached more importance to Plant Industry than to the other subjects and would make Agricultural Engineering or Animal Husbandry optional.

Dr. Mann said that he would agree to two of the three groups, Agricultural Engineering, Animal Husbandry and Plant Industry.

Mr. Sampson said that to his men he would make six months on the farm compulsory. Their men were not farmers and their training in the Agricultural Colleges and on experimental farms was not sufficient.

Mr. A. G. Birt agreed as to the weakness of their men in practical agriculture.

Mr. Clague said that he would make the farm course compulsory.

After further discussion it was agreed that the course of studies should be divided into three groups. Each student would take two of these groups and the course in each group would occupy about six months.

Group I.—Animal Husbandry, including land management, Fodder crops, Manures, storage of fodder crops, feeding of animals, etc.

Group II.—Plant Industry.

Group III.—Agricultural Engineering including Agricultural machinery, part of the time being spent in farm.

It was then considered whether Group I should be compulsory. It was decided that it was unnecessary, but that it should be recommended to all provinces that their students should take this group.

The Agricultural Adviser then asked the provincial representatives to explain what subject they would like included in the Farm Engineering course, as they had not yet an Agricultural Engineer at Pusa. The following subjects were provisionally suggested :—

- (1) Water lifts.
- (2) The Alignment and discharge of drains.
- (3) Pumping Installations.
- (4) Contour Surveying.
- (5) Prime Movers.
- (6) Irrigation by small power plants.
- (7) Tractors.
- (8) Agricultural implements.
- (9) Farm buildings.
- (10) Well sinking and boring.
- (11) Measurement of water discharges.
- (12) Embankments for the prevention of erosion.

The Committee then proceeded to the discussion of the course (B) Special Science courses.

Dr. Mann said that he would like to emphasise again the agricultural aspect and the importance to students of an agricultural outlook. There was a distinct danger of their outlook being narrowed to that of particular sides instead of being attracted to broader agricultural aspects of the problem. It was agreed that this might be made clear in the preamble to the Prospectus.

CONDITIONS OF APPOINTMENT.

Condition (1) of the Prospectus was accepted.

In regard to condition (2) Dr. Harrison and Mr. Hutcheson explained the necessity for ordinary University Graduates taking a year in an Agricultural College to learn Agricultural chemistry before taking a post graduate course in their subjects, otherwise the students' time at Pusa would be wasted for elementary work which would have been learnt elsewhere.

Condition (2) was amended by substitution of the words "Recommended by the Director of Agriculture of the Province" for "Recommended by the Principal of the College".

Condition (3) was omitted as unnecessary.

Condition (4) was accepted.

Syllabus.—It was agreed that the courses given in the printed Prospectus were out of date and unsuitable. It was decided that men would be sent to Pusa to be associated with the work of a section and to undertake a definite piece of work, as training in research methods. The length of the course would depend on the man and the piece of research work on which he was engaged. It was agreed that a minimum period should be one year which might be extended to a maximum of two years, as required.

Certificates.—It was agreed that certificates should be given that the student had attended the course and done satisfactory work.

It was agreed that it should be emphasised that this course should be made as good a qualification for the Indian Agricultural Service as a post-graduate course in England.

Library.—It was agreed that it might be necessary to duplicate sectional libraries so that all books should be readily available to all advance students.

APPENDIX IV.

ESTABLISHMENT OF AN ENLARGED ANIMAL NUTRITION INSTITUTE
AT DEHRA DUN.

Attention is invited to the attached letters Nos. 3409 and 3568, dated respectively, the 27th May and 2nd June 1930, from the Director, Imperial Institute of Agricultural Research, Pusa, on the above-mentioned subject. The Physiological Chemist, Bangalore, who has worked out the scheme estimates its cost at Rs. 1,46,000 non-recurring and Rs. 71,500 per annum recurring; in order to arrive at the net extra cost a further Rs. 3,000 per annum on account of "Director's allowance" should be subtracted from the estimate of recurring expenditure, as this is not likely to be sanctioned if the scheme materialises. The estimates are, however, incomplete as they do not include the cost of the farm to be attached to the Institute for which no site has yet been selected. The Government of India would however in the meantime be grateful for the views of the Advisory Board as to the necessity for such an Institute and the scope of the work it could do.

M. S. A. HYDARI,
Secretary.

The 15th December 1930.

ENCLOSURE I.

LETTER FROM THE DIRECTOR, IMPERIAL INSTITUTE OF AGRICULTURAL RESEARCH, PUSA, TO THE SECRETARY TO THE GOVERNMENT OF INDIA, DEPARTMENT OF EDUCATION, HEALTH AND LANDS, No. 3409, DATED THE 27TH MAY 1930.

Establishment of a Central Research Institute for Animal Nutrition in India.

With reference to the correspondence ending with Mr. Rahim's letter No. 1021-Agri., dated the 28th April 1930, I have the honour to forward herewith, for necessary action, a scheme for converting the X-ray Institute at Dehra Dun into an Animal Nutrition Institute, as drawn up by Mr. F. J. Warth, Physiological Chemist. The estimates are based on plans worked out in full detail. The quantities involved in construction work have been calculated by a qualified engineer and the cost has been estimated mainly at rates prevalent in Bangalore.

2. The total non-recurring expenditure of the scheme is estimated at Rs. 1,46,000 of which Rs. 31,650 relate to construction and Rs. 96,400 to equipment. Mr. Warth proposes to have the works relating to construction and equipment done departmentally under the supervision of his First Assistant Mr. A. V. Iyer and Mr. Wilfred, a clerk of the Imperial Dairy Expert who has the qualifications of a draftsman. As apparently none of these officers has adequate technical knowledge of building operations and as the scheme involves electrical and water installations which, under para. 313 of the P. W. D. Code, have to be carried out through the agency of the Public Works Department, I think it would be preferable to have the construction works and those relating to electrical and water installations entrusted to the Executive Engineer, Imperial Works Division, Dehra Dun, on whose books the X-ray Institute is borne.

3. It will appear from the scheme that Mr. Warth has proposed for himself an additional allowance of Rs. 250 per mensem as Director of the Institute, I regret I am unable to support this proposal for the reason that the Institute will rank as a section of this Department and therefore, so far as I can see, will only stand in the same relation to the Director as other sections of it. Mr. Warth already draws the allowance admissible to the Heads of Sections of the Pusa Institute and there appears to be no reason for treating him preferentially.

4. A detailed statement of the present staff and the cost of the Physiological Chemist's Section as compared with the staff and the cost of the proposed Institute at Dehra Dun will follow as it has not yet been received from Mr. Warth.

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**Proposed Scheme for converting the X-ray Institute, Dehra Dun,
into an Animal Nutrition Institute.**

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EXPLANATORY NOTE.

1. *General.*—The present proposals are made on the understanding that a suitable cattle breeding farm attached to the institute and situated in the vicinity is deemed essential and will be provided in the near future.

The X-ray Institute is admirably suited for the scientific part of the work. In this connection the following points deserve special notice :—

- (a) The three main laboratory buildings can be used practically as they stand. It is proposed to spend no more than Rs. 750 on reconstruction in this part.
- (b) There is a large commodious block of stables which can be converted at relatively little cost (Rs. 2,500) into excellent nutrition stalls.
- (c) The adjacent old stables are conveniently situated for employment as preparation rooms in connection with the nutrition stalls.
- (d) Some of the existing store houses and the workshop are needed by the Nutrition Section and will be employed as they are at present.
- (e) There is a block of waste land, 14 acres in extent. This will provide space for small scale cropping and grazing experiments which have to be carried out under close laboratory control.
- (f) The difficult problem of finding quarters for the staff can be met by effecting alterations to existing buildings. It is estimated that ten quarters will be provided in this way at a cost of Rs. 16,000.

In short the main buildings, the permanent and subsidiary buildings, the extensive stables and the waste land will be useful for the Animal Nutrition Institute.

2. *Proposed utilisation of the buildings of the present X-ray Institute.*—All the existing buildings of the X-ray Institute are shown in the accompanying site plan (Plan No. 1), in which a new serial number has been given to each building. The proposed utilisation of each building is shown in tabular form in Table I, which shows also the cost of reconstruction. It will be observed that with the exception of the water tower (item 15) no new building is to be erected. Existing buildings, suitably modified, will be used for the gas plant, the water pump and motor shed, the nutrition stalls, the preparation rooms for nutrition work, housing of weighbridge and on a relatively large scale for quarters. The expenditure on reconstruction is further classified in Table II (Summary of capital expenditure) where it will be seen that construction costs for the entire scheme are distributed as follows :—

| | | | | Rs. |
|-------------------------|----|----|----|--------|
| (a) Laboratory adjuncts | .. | .. | .. | 8,650 |
| (b) Nutrition work | .. | .. | .. | 5,000 |
| (c) Quarters | .. | .. | .. | 16,000 |
| (d) Drainage | .. | .. | .. | 2,000 |
| | | | | 31,650 |

These estimates are based on the assumption that the work is to be carried out departmentally as follows :—

When construction is to commence, Mr. A. V. Iyer, Senior Assistant to the Physiological Chemist, will be transferred to Dehra Dun, where quarters in the Institute are ready for him to occupy. He will supervise the construction of the laboratory adjuncts and the nutrition stalls. To assist him in technical matter

pertaining to building, it is proposed to place Mr. Wilfred, Draftsman in the office of the Imperial Dairy Expert and a qualified Engineer, on special duty for such time as may be necessary. The Imperial Dairy Expert has kindly consented to lend Mr. Wilfred for this work and we think he should receive an acting allowance of Rs. 50 per mensem while on this special duty.

The reasons for this proposal to carry out the reconstruction departmentally are as follows :—

(1) The construction connected with the laboratory adjuncts and the nutrition stalls is highly technical and should be under the entire control of the Nutrition Section.

(2) The construction connected with quarters consists of a number of petty works, which can be carried out with ease departmentally and are scarcely worth handing over to the Public Works Department, if the remainder of the work is retained in our hands.

(3) It is proposed to carry out the fitting up of the laboratory simultaneously with the construction. This is quite feasible as actual construction in the main laboratory buildings is not required. For this fitting up work Mr. Iyer will get valuable help and advice from Mr. Wilfred.

(4) The reconstruction desired by the Section is well understood by Mr. Wilfred, who has drawn up all the plans for this work under my direction and has worked out the quantities. As these two officers are available in the department, it is felt that the proposed arrangement cannot be improved upon for producing exactly what is required. It is estimated that the entire scheme of construction and equipment could be completed in six months.

3. *Equipment.*—The cost of equipment (summarised in Table II) is distributed as follows :—

| | Rs. |
|---|---------------|
| (a) Laboratory, offices and laboratory adjuncts | 74,200 |
| (b) Nutrition work | 9,200 |
| (c) Electrical installation to laboratories, offices, nutrition stalls and quarters | 6,000 |
| (d) Water supply to laboratories, offices, nutrition stalls and estate | 5,000 |
| (e) Fencing of the estate | 2,000 |
| Total | 96,400 |

Details under heads *a*, *c* and *d*, are given in subsidiary estimates (Tables III, IV, V and VI). There is a certain amount of furniture at present in the Institute. Some of this could be made use of by the Nutrition Section if it is not required by the Medical Department.

4. *Total Capital expenditure.*—The capital expenditure summarised in Table II is distributed as follows :—

| | Rs. |
|---|-----------------|
| (a) Construction | 31,650 |
| (b) Equipment | 96,400 |
| (c) Transfer | 14,500 |
| (d) Miscellaneous and contingencies | 3,450 |
| Total | 1,46,000 |

It should be noted that of the total expenditure, over Rs. 83,000 are devoted to the equipment of the laboratories and nutrition stalls.

Recurring Expenditure.

Assuming that the X-ray Institute at Dehra Dun will be taken over on 1st September 1930, the remaining six months of the current financial year will be occupied in carrying out the building operations and the equipment, items which are debitable to capital expenditure only, so that no extra recurring expenditure will be incurred during this financial year. For the financial year 1931-32, the extra recurring expenditure, consequent on the working of the enlarged Institute of Animal Nutrition at Dehra Dun, is estimated at Rs. 7,800 made up as follows :—

| | Rs. |
|--|-------|
| (a) Director's allowance at Rs. 250 per mensem .. | 3,000 |
| (b) Upkeep of roads and buildings | 2,000 |
| (c) Extra cost of fodder to maintain additional live stock | 1,000 |
| (d) One Mechanic and Assistant | 720 |
| (e) Care of Estate. Two Chowkidars and Two Malis .. | 648 |
| (f) Sanitation. Three sweepers | 432 |
| Total | 7,800 |

No special explanation appears to be necessary for any of these items with the exception of the personal allowance of Rs. 250 per mensem to myself as Director of the New Institute. It is hoped that in view of the increased scope of the work at Dehra Dun and the increased responsibilities entailed thereby, Government will consider this a reasonable demand especially in view of the fact that had I remained at Pusa, I would have received from time to time a similar allowance when acting as Joint Director.

The above items of recurring expenditure will be included in the budget estimates of the Section for 1931-32.

F. J. WARTH,
Physiological Chemist,
The Imperial Institute of Animal
Husbandry and Dairying, Bangalore.

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TABLE I.—EXISTING BUILDINGS OF THE X-RAY INSTITUTE AND PROPOSED USE OF EACH.

| No. | Present designation. | Proposed use. | Cost of reconstruction. | Remarks. |
|-------|---|---|-------------------------|--|
| 1 | X-ray Institute .. | Laboratory .. | Ra. 750 | |
| 2 | Orthopaedic Institute .. | Laboratory .. | .. | |
| 3 | X-ray treatment block | Laboratory .. | .. | |
| 4 | Power-house and Workshop. | Dairy .. | .. | |
| 5 | Store room .. | .. | .. | A four-walled building without roof. |
| 6 | Store room .. | Water-pump power house. | 400 | Cost of foundation for motor and pump; cost of aperture for belt. |
| 7 | Wadding shed .. | .. | .. | This is a temporary structure. |
| 8 | Power house .. | Gas House .. | 3,000 | Including cost of foundation for furnace, retort and gas holders. |
| 9 | Temporary godown .. | .. | .. | A temporary structure. |
| 10 | Shed for workshop .. | Shed for workshop .. | .. | A temporary structure. |
| 11 | .... | .. | .. | Temporary structure. |
| 12 | Workshop .. | Workshop .. | .. | Temporary structure. |
| 13 | Store room .. | Store room .. | .. | |
| 14 | Testing house .. | .. | .. | A semi-permanent building. |
| 15 | .... | Water-tower .. | 4,500 | New structure. |
| 16-22 | Superintendent's Quarter with out-houses. | Physiological Chemist's quarters with out-houses. | .. | |
| 23-26 | Quarters and Out-houses. | Quarters and out-houses | 1,708 | Total cost for quarters Rs. 15,313 or Rs. 16,000. |
| 27 | Battery room .. | Quarters .. | 2,835 | |
| 28 | Cart-shed and harness room | Two Quarters .. | 4,020 | |
| 29 | Hospital Assistant's Quarters. | Quarters .. | 500 | |
| 30 | Clerk's quarters and Out-houses, and | Four Quarters | 2,869 | |
| 31 | Servants' quarters .. | .. | 3,381 | |
| 32-33 | Syces' quarters .. | Servants' quarters .. | .. | |
| 34 | Old Stables .. | Shed for weighbridge, Nutrition apparatus and preparation room. | 1,000 and 1,500 | Including reconstruction and laying down foundations for weighbridges. |
| 35 | New Stables (Mule shed). | Nutrition stalls .. | 2,500 | Including reconstruction and flooring. |
| 36-37 | Store .. | Store .. | .. | |
| 38-39 | Chowkidars' quarters .. | Chowkidars' quarters .. | .. | |

TABLE II.—SUMMARISED STATEMENT OF CAPITAL EXPENDITURE.
A. CONSTRUCTION.

| | | Rs. | Rs. |
|--|-------|--------|---------------|
| 1. Laboratory and Office. | | | |
| (a) Gas plant housing, etc. | .. .. | 3,000 | |
| (b) Water-pump and motor housing | .. .. | 400 | |
| (c) Water-tower and tank | .. .. | 4,500 | |
| (d) Structural alterations | .. .. | 750 | 8,650 |
| <hr/> | | | |
| 2. Nutrition work. | | | |
| (a) Conversion of stables into cattle stalls | .. .. | 2,500 | |
| (b) Foundations for two weighbridges | .. .. | 1,500 | |
| (c) Conversion of old stables into barn and preparation room | .. .. | 1,000 | 5,000 |
| <hr/> | | | |
| 3. Quarters. | | | |
| Alterations and additions to existing buildings for conversion into quarters | .. .. | 16,000 | 16,000 |
| <hr/> | | | |
| 4. Drainage. | | | |
| Construction of drainage in the estate | .. .. | 2,000 | 2,000 |
| <hr/> | | | |
| Total for construction |  | .. .. | 31,650 |
| <hr/> | | | |
| B. EQUIPMENT. | | | |
| 1. Laboratory and Office. | | | |
| (a) Laboratory benches, Fume chambers, fume exhaust systems, office furniture, etc. | .. .. | 34,600 | |
| (b) Laying on of water and gas taps, pipes, sinks, drains, grids, etc. | .. .. | 22,000 | |
| (c) Purchase and erection of gas plant and water-pump | .. .. | 15,600 | |
| (d) Library books | .. .. | 2,000 | 74,200 |
| <hr/> | | | |
| 2. Nutrition work. | | | |
| (a) Purchase of livestock | .. .. | 3,000 | |
| (b) Equipment and furniture | .. .. | 1,200 | |
| (c) Two weighbridges | .. .. | 5,000 | 9,200 |
| <hr/> | | | |
| 3. Electrical installations in the laboratory, office, nutrition stalls, quarters, etc. | | | |
|  | .. .. | 6,000 | 6,000 |
| <hr/> | | | |
| 4. Water supply to the Estate | | | |
|  | .. .. | 5,000 | 5,000 |
| <hr/> | | | |
| 5. Fencing of the Estate | | | |
|  | .. .. | 2,000 | 2,000 |
| <hr/> | | | |
| Total cost of equipment |  | .. .. | 96,400 |
| <hr/> | | | |

| C. TRANSFER. | | | |
|--|-------|-------|----------|
| | | Rs. | Rs. |
| (a) Freight on apparatus, etc. | .. .. | 6,500 | |
| (b) T. A. of Officers and Staff | .. .. | 8,000 | 14,500 |
| <hr/> | | | |
| D. MISCELLANEOUS. | | | |
| (a) Allowance to the Draftsman, including his T. A. but excluding his salary | .. .. | 500 | |
| (b) Contingencies | .. .. | 2,950 | 3,450 |
| <hr/> | | | |
| Total Capital Cost | .. .. |  | 1,46,000 |
| <hr/> | | | |

TABLE III.—LABORATORY BENCHES AND OFFICE FURNITURE.

| Block No. 1. | | | | Rs. |
|---|-------|-------|-------|--------|
| Dark Room and Ante room to the same. (Not fitted up.) | | | | |
| Office room | .. .. | .. .. | .. .. | 220 |
| Assistants' room | .. .. | .. .. | .. .. | 350 |
| Senior Assistant's room | .. .. | .. .. | .. .. | 145 |
| Lecture room and Post Graduate students' Laboratory | .. .. | .. .. | .. .. | 2,060 |
| Officers' rooms | .. .. | .. .. | .. .. | 655 |
| General Office and record rooms | .. .. | .. .. | .. .. | 880 |
| Library and Librarian's office | .. .. | .. .. | .. .. | 3,500 |
| <hr/> | | | | |
| Block No. 2. | | | | |
| Special laboratory | .. .. | .. .. | .. .. | 3,144 |
| Combustion and large apparatus room | .. .. | .. .. | .. .. | 1,430 |
| Kjeldahl digestion room | .. .. | .. .. | .. .. | 2,525 |
| Distillation room | .. .. | .. .. | .. .. | 400 |
| Still room | .. .. | .. .. | .. .. | 200 |
| Laboratory store | .. .. | .. .. | .. .. | 855 |
| General laboratory | .. .. | .. .. | .. .. | 7,122 |
| Balance room | .. .. | .. .. | .. .. | 830 |
| Drying room | .. .. | .. .. | .. .. | 100 |
| Preparation room | .. .. | .. .. | .. .. | 730 |
| Sampling room | .. .. | .. .. | .. .. | 660 |
| Sectional library | .. .. | .. .. | .. .. | 380 |
| <hr/> | | | | |
| Block No. 3. | | | | |
| Special laboratory | .. .. | .. .. | .. .. | 1,398 |
| <hr/> | | | | |
| (Outside.) | | | | |
| General store | .. .. | .. .. | .. .. | 1,500 |
| Eleven Fume exhaust systems | .. .. | .. .. | .. .. | 5,500 |
| <hr/> | | | | |
| Total |  |  | .. .. | 34,584 |
| | | | | or |
| | | | | 34,600 |
| <hr/> | | | | |

TABLE IV.

1. *Estimate of laying on gas piping and taps, water piping, taps and sinks in the laboratory.*—A detailed plan has been drawn showing every pipe, tap and sink required. From past experience it is estimated that the cost of purchase and fixing up will amount to about Rs. 17,000.

Contractor's estimates are not available at present.

2. *Estimate for construction of laboratory drains with grids, sumps and connections.*—A detailed plan has been drawn showing all drains.

From past experience it is estimated that the cost will be about Rs. 5,000.

Contractor's estimates are not available at present.

| | | | Rs. |
|--------------------------------------|----|----|---------------|
| Estimated cost of piping, taps, etc. | .. | .. | 17,000 |
| Estimated cost of drains, etc. | .. | .. | 5,000 |
| Total | .. | .. | <u>22,000</u> |

TABLE V.—ELECTRIC SUPPLY FOR LABORATORY, NUTRITION STALLS AND QUARTERS.

| | Rs. | Rs. |
|--|--------------|-------|
| (a) For 9 big posts, main wires and 12 small posts | 2,400 | |
| (b) For cattle sheds, Barn and preparation room | 200 | |
| (c) For quarters, including cost of metres | 2,300 | |
| (d) For readjustment of points in the laboratory | <u>1,100</u> | 6,000 |

TABLE VI.—LAY OUT AND COST OF WATER SUPPLY.

Washing and drinking supply.

| | Rs. | s. | p. | Rs. |
|--|------------|----|----|-------|
| (a) 850 ft. 4" galvanised steel pipes | 1,700 | 0 | 0 | .. |
| (b) 500 ft. 2" galvanised steel pipes | 500 | 0 | 0 | .. |
| (c) 1,300 ft. 1½" galvanised steel pipes | 975 | 0 | 0 | .. |
| (d) 1,750 ft. 1" galvanised steel pipes | 637 | 8 | 0 | .. |
| (e) 36½" water taps | 108 | 0 | 0 | .. |
| (f) Extra bends, angles, tees, etc. | 500 | 0 | 0 | .. |
| (g) Labour and contingencies | <u>579</u> | 8 | 0 | 5,000 |

ENCLOSURE II.

LETTER FROM THE DIRECTOR, IMPERIAL INSTITUTE OF AGRICULTURAL RESEARCH,
PUSA, TO THE SECRETARY TO THE GOVERNMENT OF INDIA, DEPARTMENT OF
EDUCATION, HEALTH AND LANDS, No. 3568, DATED THE 2ND JUNE 1930.

In continuation of my letter No. 3409, dated the 27th May 1930, I have the honour to forward herewith a detailed statement of the present staff and the cost of the Physiological Chemist's Section at Bangalore, as compared with the staff and the cost of the proposed Institute at Dehra Dun, as submitted by Mr. Warth.

Detailed Statement of the present Staff at Bangalore :—

| No. | Present staff at Bangalore. | Cost. | Remarks. |
|-----|--|--------|----------|
| | | Rs. | |
| 1 | Physiological Chemist | 19,800 | |
| 2 | First Assistant to the Physiological Chemist .. | 7,000 | |
| 3 | Four Assistants, two clerks and two Fieldmen .. | 11,740 | |
| 4 | One Sardar, two Laboratory attendants and four Peons | 1,160 | |
| 5 | Temporary Establishment | 2,700 | |
| | Total cost of Establishment at Bangalore .. | 42,400 | |

Detailed Statement of the Proposed Staff at Dehra Dun :—

| No. | Proposed staff at Dehra Dun. | Cost. | Remarks. |
|-----|--|--------|----------|
| | | Rs. | |
| 1 | Physiological Chemist | 19,800 | |
| | Director's Allowance | 3,000 | |
| 2 | First Assistant to the Physiological Chemist .. | 7,000 | |
| 3 | Four Assistants, two clerks and two Fieldmen .. | 11,740 | |
| 4 | One Mechanic | 480 | |
| 5 | One Sardar, two Laboratory attendants and four Peons | 1,160 | |
| 6 | One Mistry | 240 | |
| 7 | Temporary Establishment | 2,700 | |
| 8 | Two chowkidars, two malis and three sweepers .. | 1,080 | |
| | Total cost of Establishment at Dehra Dun .. | 47,200 | |

Detailed Statement of Expenditure under other Heads at Bangalore :—

| No. | Budget Heads. | Cost. | Remarks. |
|-----|--|--------|----------|
| | | Rs. | |
| 1 | <i>Allowances, etc.—</i> | | |
| | T. A. (Non-voted and voted) | 3,800 | |
| 2 | <i>Purchase of cattle</i> | 6,000 | |
| 3 | <i>Purchase of New Machinery, Apparatus, etc.</i> .. | 9,000 | |
| 4 | <i>Contingencies</i> | 2,500 | |
| | Total cost at Bangalore | 21,300 | |

Detailed Statement of Expenditure under other Heads at Dehra Dun :—

| No. | Budget Heads. | Cost. | Remarks. |
|-----|--|--------|----------|
| | | Rs. | |
| 1 | <i>Allowances, etc.—</i> | | |
| | T. A. (Non-voted and voted) | 3,800 | |
| 2 | <i>Purchase of cattle</i> | 7,000 | |
| 3 | <i>Purchase of New Machinery, Apparatus, etc.</i> .. | 9,000 | |
| 4 | <i>Contingencies</i> | 2,500 | |
| 5 | <i>Works (Petty construction and repairs)</i> | 2,000 | |
| | Total cost at Dehra Dun .. | 24,300 | |

F. J. WARTH,
Physiological Chemist.

APPENDIX V.

ESTABLISHMENT OF A RICE RESEARCH STATION IN THE UNITED PROVINCES.

Attention is invited to the attached letter from the Government of the United Provinces, No. 639-A., dated the 11th September 1930, in regard to the scheme for the establishment of a rice research station in Bareilly or Pilibhit District in the United Provinces. The scheme, which is explained fully in the Local Government's letter, involves a non-recurring expenditure of Rs. 1,45,950 on account of land, buildings and equipment, and Rs. 1,64,420 recurring spread over 5 years, or a total expenditure of Rs. 3,10,370. The scheme has been approved by the Provincial Agricultural Research Committee, which has recommended that the amount of Rs. 94,000 for land and buildings out of the non-recurring expenditure should be paid by the Council if the Local Government are unable to meet it. The scheme is for the consideration of the Advisory Board. In this connection, it may be noted that the Empire Marketing Board have been asked for financial assistance towards the cost of the various rice research schemes in accordance with the recommendation of the Advisory Board made at its last meeting held at Simla in June 1930 as approved by the Governing Body.

M. S. A. HYDARI,
Secretary.

The 2nd December 1930.

LETTER FROM THE SECRETARY TO GOVERNMENT, UNITED PROVINCES, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, No. G39-A., DATED THE 11TH SEPTEMBER 1930.

I am directed to forward, for consideration at the next meeting of the Imperial Council of Agricultural Research, a scheme, with detailed estimates of cost, which has been prepared by the Director of Agriculture, United Provinces, for the establishment of a rice research station in the United Provinces.

2. The area under rice in the United Provinces is about 7½ million acres and is 21 per cent. of the total cultivated area. Rice forms the staple food of 75 per cent. of the population of the provinces. During the last six years progress has been made with a preliminary classification and selection of good varieties from existing types; several promising varieties have already been distributed in the Sarada Canal areas. The research work hitherto conducted touches, however, only the fringe of the vast field of work required on this important crop, but has reached a stage at which the establishment of a well equipped research and experimental station to start breeding work and to conduct further physiological experiments, for which valuable material has been collected, is essential.

3. The total cost of the scheme, spread over a period of five years, amounts to Rs. 3,10,370, the details of which are given in the two statements enclosed. The Imperial Council of Agricultural Research propose to ask the Empire Marketing Board to share between the two the financing of the rice research schemes submitted by the various provinces. I am therefore to request that the Imperial Council of Agricultural Research may be moved to sanction a grant to this Government of Rs. 3,10,370, spread over a period of five years to meet the cost of establishing and maintaining a rice research station in these provinces. I am also to say that the grant applied for can, if sanctioned, be accepted only on the clear understanding that its acceptance will not commit this Government to any expenditure in connexion with the scheme.

L2SECAR.

Cost of establishing a Rice Research Station in Bareilly or Pilibhit District.

Recurring Expenditure.

| Items. | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. | Total five years. | Ultimate recurring cost. |
|---|---------------|---------------|---------------|---------------|---------------|-------------------|--------------------------|
| | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1. Pay of officers— | | | | | | | |
| 1 Assistant Paddy Specialist on Rs. 250—25—750. | 3,000 | 3,300 | 3,600 | 3,900 | 4,200 | 18,000 | 9,000 |
| Total pay of officers .. | 3,000 | 3,300 | 3,600 | 3,900 | 4,200 | 18,000 | 9,000 |
| 2. Pay of establishment— | | | | | | | |
| 1 Farm Superintendent on Rs. 150—10—250. | 1,800 | 1,920 | 2,040 | 2,160 | 2,280 | 10,000 | 3,000 |
| 2 Research Assistants on Rs. 150—10—250 each. | 3,600 | 3,960 | 4,320 | 4,680 | 5,040 | 20,400 | 6,000 |
| 2 Fieldmen on Rs. 66—5—120 each | 1,560 | 1,680 | 1,800 | 1,920 | 2,040 | 9,000 | 2,880 |
| 2 Laboratory Assistants on Rs. 30—3—60 each. | 720 | 792 | 864 | 936 | 1,008 | 4,320 | 1,440 |
| 2 Laboratory attendants on Rs. 12—2—22 each. | 288 | 336 | 384 | 432 | 480 | 1,920 | 624 |
| 1 Clerk and Store-keeper on Rs. 75—3—120. | 900 | 936 | 972 | 1,008 | 1,044 | 4,860 | 1,440 |
| 1 Peon on Rs. 12 | 144 | 144 | 144 | 144 | 144 | 720 | 144 |
| Total pay of establishment .. | 9,012 | 9,648 | 10,284 | 10,920 | 11,556 | 51,420 | 15,432 |
| 3. Allowances— | | | | | | | |
| Travelling allowance | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 15,000 | 3,000 |
| Total allowances | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 15,000 | 3,000 |
| 4. Supplies and Services— | | | | | | | |
| Running charges of Laboratory .. | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 15,000 | 3,000 |
| Running charges of Experimental station. | 8,000 | 8,000 | 8,000 | 8,000 | 8,000 | 40,000 | 8,000 |
| Field Experimental Work | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 | 25,000 | 5,000 |
| Total Supplies and Services .. | 16,000 | 16,000 | 16,000 | 16,000 | 16,000 | 80,000 | 16,000 |
| GRAND TOTAL | 31,012 | 31,948 | 32,884 | 33,820 | 34,756 | 1,61,420 | 43,432 |

Cost of establishing a Rice Research Station in Bareilly or Pilibhit District.

| Item. | Non-recurring. | 1931-32. Rs. |
|---|--------------------------|-----------------|
| Land :—60 acres at Rs. 600 per acre | | 36,000 |
| Buildings :— | | |
| (1) Laboratory | | 20,000 |
| (2) Cattle shed | | 5,000 |
| (3) Seed store and implement | | 5,000 |
| (4) Inspection House | | 10,000 |
| (5) Superintendent's quarters | | 5,000 |
| (6) Assistant's quarters | | 5,000 |
| (7) Farm servant's quarters | | 3,000 |
| (8) Lay out of farm | | 5,000 |
| | Total | 58,000 |
| Equipment :— | | |
| (1) Implements and farm equipment | | 4,550 |
| (2) Bullocks, 6 pairs at Rs. 400 | | 2,400 |
| (3) Tube well Rs. 12,000 | | 12,000 |
| (4) Fencing | | 3,000 |
| (5) Equipment of laboratory | | 10,000 |
| (6) Gas plant | | 20,000 |
| | Total | 51,950 |
| | Grand Total | 1,45,950 |

Establishment of a Rice Research Station in the United Provinces.

The rice crop in the United Provinces occupies an area of about 7½ million acres. In normal years it exceeds the area covered by any other crop including wheat and is 21 per cent. of the total cultivated area. Rice forms the staple food of 75 per cent. of the population. The rice area in the United Provinces exceeds that of the Central Provinces, Berar, Assam, the Punjab and Bombay. There is a considerable trade in rice between the United Provinces and the neighbouring provinces and some of the fine varieties grown here are much in demand in other parts of Northern India.

The Economic Botanist to Government, United Provinces (Mr. R. L. Sethi) has specialised on botanical work on rice since 1924. It is proposed that he should continue in charge of the work which it is desired to expand in view of the importance of improving the rice crop in the Sarda Canal area by the cultivation of better quality and heavier yielding transplanted varieties in place of the poor qualities of broadcast rice now widely grown over the enormous rice area commanded by the Sarda. It is proposed that the research station should be situated in the Sarda area near either Bareilly or Pilibhit where excellent irrigation facilities exist, preferably near the former so that the superior staff can find accommodation in the Civil Lines. No immediate expenditure on residences is asked for beyond and inspection house on the experiment station for use when urgent work is in progress.

During the last 6 years headway has been made with the preliminary work of classification of and selection from existing types 1,200 samples of rice from all parts of the province have been examined and 135 types isolated which possess fixed and constant characters. Several promising types have already been distributed in the Sarda areas. Experiments conducted with methods of sowing, cultivation and manuring have given definite results and studies into the root development of the plant under various environmental conditions indicate the necessity of further investigation. The research work conducted so far touches only the fringe of the vast field of work required on this important crop and it is desired now to open a well equipped rice experimental station to start breeding work and further physiological experiments for which valuable material has been collected.

The work already done on the rice crop in the United Provinces has been described in detail in the following publications by Mr. R. L. Sethi :—

A preliminary note on the rice crop in the United Provinces—*Pusa Bulletin*, 186—1928.

Root development of rice under different conditions of growth—*Memoirs of Department of Agriculture in India*, Volume XVIII, No. II—1929.

Classification and study of characters of the cultivated rices in the United Provinces—*Memoirs of the Department of Agriculture in India*, Volume XVIII, No. VI—1930.

An important problem in these provinces is the protection of the rice crop from attacks of *LEPTOCORISA VARICORNIS* F locally known as *Gundhi*. It attacks the early ripening kinds from the middle of August to the middle of October and in epidemic form it partially destroys the crop over enormous areas.

There is only one local variety *Sathi* a rough poor yielding early variety which on account of its morphological characters escapes attack. One of the earliest problems to be taken up under the new scheme will be breeding work with the object of transmitting the resistant character of *Sathi* to some of the finer kinds of early rice.

A few crosses were made in 1929 but further extension of this work will be more effectively done in a rice tract growing representative early types of rice.

Investigations of the threshing and milling qualities of the different strain of rice and a study of their characters on which their special value as food depends will also be undertaken. As already stated there is a large trade in rice between the United Provinces and the neighbouring provinces. *Hansraj* and *Bansmati* which are produced mainly in the United Provinces are in demand all over Northern India. The production of better types of these varieties would, therefore, be of more than provincial importance.

The cost of the proposed rice experiment station is given in the enclosure to this note. The total expenditure for a 5 years' scheme is :—

| | Rs. |
|-------------------------------|----------|
| Staff | 69,420 |
| Travelling allowance | 15,000 |
| Supplies and Services | 80,000 |
| Equipment | 51,950 |
| Land and Buildings | 94,000 |
| Total | 3,10,370 |

APPENDIX V-A.

REPORT OF THE COMMITTEE APPOINTED TO CONSIDER THE UNITED PROVINCES RICE RESEARCH SCHEME.

Programme of work.—It was explained that a good deal of work in plant genetics would continue to be carried on at Cawnpore but on the proposed new station some breeding work, notably in connection with the production of a hybrid resistant to the rice sapper insect, would be carried out. Testing of pure strains, their multiplication under botanical control, experimental work on rotations and cultivation methods suitable to the Sarda canal area would complete the programme of work. Mr. Sethi suggested that some chemical work also should be conducted on this station on the nutritive quality of United Provinces rices and also some soil work. The Committee considered that such work would be better carried out at Cawnpore where fully equipped laboratories are available.

2. It was explained that approximately 32 acres of land would be under rice each year and 8 acres under sugarcane, the remainder of the 60 acres would be under other rotation crops.

3. *Recurring expenditure.*—The Committee approved of the pay proposed for the Assistant Paddy Specialist and of the proposals for the establishment subject to the substitution of 4 non-graduate fieldmen (plant collectors) on the scale 35—3—50 for two fieldmen on the higher scale originally proposed.

Allowances.—Travelling allowances should be reduced to Rs. 2,000 per annum.

Supplies and Services.—In view of what has been said above about the programme of work, the Committee consider that Rs. 1,500 per annum is sufficient for running charges of the laboratory and Rs. 6,000 per annum for running charges of the experimental station including field experimental work making a total of Rs. 7,500 per annum for Supplies and Services. As amended the recurring cost of the scheme would average Rs. 19,952 per annum, details being as follows :—

| | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. | Total five years. |
|---|-----------|-----------|-----------|-----------|-----------|-------------------|
| | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1. Pay of Officers— | | | | | | |
| 1. Assistant Paddy Specialist on Rs. 250—25—750 | 3,000 | 3,300 | 3,600 | 3,900 | 4,200 | 18,000 |
| Total pay of officers | 3,000 | 3,300 | 3,600 | 3,900 | 4,200 | 18,000 |
| 2. Pay of establishment— | | | | | | |
| 1. Farm Superintendent on Rs. 150—10—250 | 1,800 | 1,920 | 2,040 | 2,160 | 2,280 | 10,200 |
| 2. Research Assistants on Rs. 150—10—250 each | 3,600 | 3,840 | 4,080 | 4,220 | 4,560 | 20,400 |
| 4. Fieldmen on Rs. 35—3—50 | 1,680 | 1,824 | 1,968 | 2,112 | 2,256 | 9,840 |
| 2. Laboratory Assistants on Rs. 30—3—60 each | 720 | 792 | 864 | 936 | 1,008 | 4,320 |
| 2. Laboratory attendants on Rs. 12—2—22 each | 288 | 336 | 384 | 432 | 480 | 1,920 |
| 1 Clerk and Store-keeper on Rs. 75—3—120 | 900 | 936 | 972 | 1,008 | 1,044 | 4,860 |
| 1 Peon on Rs. 12 | 144 | 144 | 144 | 144 | 144 | 720 |
| Total pay of establishment | 9,132 | 9,792 | 10,452 | 11,112 | 11,772 | 52,260 |
| 3. Allowances— | | | | | | |
| Travelling allowance | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 10,000 |
| Total allowances | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 10,000 |
| 4. Supplies & Services— | | | | | | |
| Running charges of laboratory | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 7,500 |
| Running charges of experimental station | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 | 30,000 |
| Total supplies and services | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 37,500 |
| Total recurring | 18,632 | 19,292 | 19,952 | 20,612 | 21,272 | 99,760 |

ENCLOSURE I

COPY OF LETTER FROM UNDER SECRETARY TO THE GOVERNMENT OF BOMBAY, REVENUE DEPARTMENT, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, NO. 3461-A.28, DATED THE 2ND DECEMBER 1930.

Rice Physiology Scheme.—Application for a grant-in-aid for the—.

With reference to your letter No. 1817-Genl., dated 17th September 1930, I am directed by the Government of Bombay (Transferred Departments) to forward 100 copies of the Rice Physiology Scheme prepared by Professor R. H. Dastur, Professor of Botany, Royal Institute of Science, Bombay, and to state that the scheme was laid before the Provincial Agricultural Research Committee at its meeting held on 13th October 1930. The Committee has asked this Government to commend the scheme to the favourable consideration of the Imperial Council of Agricultural Research. The Government of Bombay support it and recommend that a grant-in-aid of Rs. 10,300 may be made towards the cost of the scheme. I am to add that the provincial contribution to the scheme will be relatively considerable as the Royal Institute of Science, in addition to providing the services of Professor Dastur, will provide facilities in the shape of the use of their buildings, laboratories and some apparatus. The Government of Bombay will not therefore be in a position to make any further monetary contribution towards the cost of the scheme.

ENCLOSURE II.

RICE PHYSIOLOGY SCHEME PREPARED BY PROFESSOR R. H. DASTUR,
PROFESSOR OF BOTANY, ROYAL INSTITUTE OF SCIENCE,
BOMBAY.

The Physiology of the Rice plant has been studied so far mainly with a direct view to cultivation and the work done has centred mainly on the manurial requirements of the plant; valuable information has been collected on this particular topic. What is still needed is special knowledge of the life processes of the plant, and how these processes are affected by external factors, namely soil and climate. A thorough study of the Physiology of the Rice plant would yield results of practical value which will enable us to tell the requirements of the plant better than at present.

I commenced work on the subject (the Physiology of the Rice plant) in 1927, in conjunction with post-graduate students. The following summary indicates what has been done and what is going on:—

- (1) The absorption of water from the soil depends upon the suction pressures of the plant: in order to determine the force with which water is absorbed, the osmotic and suction pressures of the Rice plant were measured throughout its life-time: this was done successively for three seasons. Reliable information has been collected on the subject and is in course of publication.
- (2) During the progress of the above investigation it was discovered that the addition of ammonium sulphate to the soil brought about a sudden rise in the osmotic and suction pressure of the plant. This fact led to a fresh avenue of research. Increase in the osmotic and suction pressure showed that the salt was absorbed. When plants were treated with nitrates no such rise was noticed: it is already known that nitrates are not absorbed by the plants in the early stages of growth. Hence I attempted to determine if the absorption of a salt and its relative value as a fertilizer can be found by measurements of the pressures of the plant before and after treatment. These measurements are easily carried out. The results so far obtained are very encouraging: if and when they are finally established there will be in the hands of agriculturists a simple method for determining the entry of a salt and its relative value as a fertilizer to the plant. At present the only method that is available requires the lengthy method of chemical analysis of the plant and measurement of the yield of straw and grain.
- (3) It is known that nitrogen is absorbed by the Rice plant in the form of ammonium salts in the early stages and of nitrates in the latter stages. But no quantitative data has been collected about the intake of salts from the external medium, and nothing is known about their absorption ratios (*i.e.*, the relation between the final internal and external concentration of the salt). This is important because the entry of the salt ceases when the position of equilibrium between inside and outside is reached. This is probably the cause of waste of nitrogenous fertilizers supplied to the soil. The investigation carried on here has yielded the following facts:—
 1. There is unequal absorption of NH_4 and SO_4 ions, the former being absorbed in excess of the latter.
 2. Absorption of NH_4 ions decreases as the plant ages.
 3. Absorption of NO_3 ions increases as the plant ages.

4. The absorption of NH_4 , SO_4 or NO_3 ions is independent of the presence or absence of foreign ions in the external medium.
5. The absorption ratios for NH_4 and SO_4 for different concentrations of $(\text{NH}_4)_2\text{SO}_4$ at a particular stage of growth are expressed by the equation $y = a + b$ where a and b are constants, i.e., the curves for the ratios are straight lines. Similar information is being collected for other salts.
- (4) The photosynthetic activities of the Rice plant are measured (a) by estimating the carbohydrates in the leaves at definite intervals in the season and (b) by measuring the absorption of carbon dioxide per unit leaf area. Apart from other points of importance I am attempting to prepare correlation tables between the photosynthesis and the water content of the leaves; I have established these relationships between the two in my work on other plants. If this is done, it would be possible to tell approximately the photosynthetic activity of a leaf by finding its water content.
- (5) Similarly the respiration and transpiration activities of the Rice plant are being investigated.

My work on the Physiology of Rice is carried on with the help of post-graduate students. At present I have 7 post-graduate students working on the subject. I find that the work suffers because these students tend to leave at the end of two years while fresh students take time to learn the technique of the work. I therefore need the help of an assistant who would be a student who has already worked under me on the physiology of the Rice plant for at least two years.

The general expenses are met by my department and I need some special apparatus for the work: so I propose the following expenditure for a period of three years:—

| Research Assistant. | 1st year. | 2nd year. | 3rd year. | Total. |
|-------------------------------|-----------|-----------|-----------|--------|
| | Rs. | Rs. | Rs. | Rs. |
| (Rs. 150—25—200) | 1,800 | 2,100 | 2,400 | 6,300 |
| Apparatus and Chemicals | 2,500 | 1,000 | 500 | 4,000 |
| Total .. | 4,300 | 3,100 | 2,900 | 10,300 |

It will be seen from the above statement of expenditure that the grant I ask for is small in comparison with the amount of work that will be done.

(Signed) R. H. DASTUR.

Department of Botany,
Royal Institute of Science.
Bombay, 15th September 1930.

APPENDIX VII.

LETTER FROM THE SECRETARY TO THE GOVERNMENT OF INDIA, DEPARTMENT OF EDUCATION, HEALTH AND LANDS, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, No. 1463-AGRI., DATED THE 10TH JULY 1930.

Education and research in Dairying.

I am directed to invite a reference to the recommendations made by the Royal Commission on Agriculture in India in paragraph 211 of their report in regard to the Imperial Institute of Animal Husbandry and Dairying at Bangalore and its substations at Willington, Karnal and Anand. The Royal Commission considered that the Dairying section of the Institute should merely be looked upon as a necessary provision during a transition stage in the work of cattle improvement and should be continued only until the establishment of a thoroughly efficient dairy school as an integral part of one or more agricultural colleges. They did not, however, recommend any change in the existing organisation during the tenure of office of the present Imperial Dairy Expert, but were of opinion that before he retired from service, arrangements should be made to transfer the work of higher instruction in dairying to the agricultural colleges and the research work on the manufacture of important milk products to Pusa or some other suitable centre.

2. This subject was discussed at the Conference conveyed by the Government of India at Simla in October 1928 to consider the report of the Royal Commission. The view taken by almost all the provincial representatives at the Conference was that there was a demand for higher training in dairying which the agricultural colleges were not then in a position to meet and that in these circumstances it would be premature to close down the Dairying Section of the Institute. In deference to this opinion, the Government of India decided not to embark on any immediate change in the organisation of that section. They, however, asked the local Governments to examine, in the meantime, the recommendation that a thoroughly efficient dairy school should be established as an integral part of one or more agricultural colleges and that the curriculum of all agricultural colleges should include instruction in cattle breeding, feeding of dairy cows and handling of milk, and enquired from them what action they proposed to take in regard to them. The replies of the local Governments are now complete and I am directed to forward copies of them with the request that they may be placed before the Imperial Council of Agricultural Research and that the views of the Council in regard to the facilities which should be provided by the Government of India for education and research in dairying may be furnished to Government in due course.

Schedule of papers sent.

1. Letter to all local Governments, No. 682-Agri., dated the 2nd May 1929.
 2. Letter from the Government of Bengal, No. 373-T. A. L., dated the 18th June 1929.
 3. Letter from the Government of Assam, No. 1493-E., dated the 24th June 1929.
 4. Letter from the Government of Madras, No 1096-Misc., dated the 29th June 1929.
 5. Letter from the Government of the Central Provinces, No. 475/338-XIV, dated the 6th July 1929.
 6. Letter from the Government of Bombay, No. 2670-A.28, dated the 15th July 1929.
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7. Letter from the Government of the United Provinces, No. 613-A., dated the 23rd July 1929.

8. Letter from the Government of Burma, No. 193-O., dated the 4th October 1929.

9. Letter from the Government of Bihar and Orissa, No. 207-D. R., dated the 20th June 1929.

10. Letter from the Government of the Punjab, No. 5729-D., dated the 17th December 1929.

LETTER TO ALL PROVINCIAL GOVERNMENTS, No. 682-AGRI., DATED THE 2ND MAY 1929.

I am directed to invite attention to the recommendations made by the Royal Commission on Agriculture in India in paragraph 211 of their Report in regard to the Imperial Institute of Animal Husbandry and Dairying at Bangalore and its sub-stations at Wellington, Karnal and Anand. The Royal Commission considered that the Dairying Section of the Institute should merely be looked upon as a necessary provision during a transition stage in the work of cattle improvement and should be continued only until the establishment of a thoroughly efficient dairy school as an integral part of one or more agricultural colleges. They did not, however, recommend any change in the existing organisation during the tenure of office of the present Imperial Dairy Expert, but were of opinion that, before he retires from service, as in the normal course he will do in 1931, arrangements should be made to transfer the work of higher instruction in dairying to the agricultural colleges and the research work on the manufacture of important milk products to Pusa or some other centre at which chemical assistance is readily available.

2. This subject was discussed at the Conference convened by the Government of India at Simla in October last to consider the Report of the Royal Commission. The view taken by almost all the Provincial representatives at the Conference was that there is a demand for higher training in dairying which the agricultural colleges are not at present in a position to meet and that, in these circumstances, it would be premature to close down the Dairying Section of the Institute. In deference to this opinion, the Government of India do not propose to make any immediate change in the organisation of that Section. The question of its future will, however, be examined in connection with the proposals for an enlarged Institute of Animal Nutrition which are at present under their consideration. The advice of the Council of Agricultural Research, when constituted, will also be obtained. In the meantime, I am to ask that the Government of Madras/Bombay, etc., will be good enough to examine the recommendations of the Royal Commission that a thoroughly efficient dairy school should be established as an integral part of one or more agricultural colleges and that the curriculum of all agricultural colleges should include instruction in cattle breeding, the feeding of dairy cows and the handling of milk, and to report what action they propose to take in regard to them.

LETTER FROM THE GOVERNMENT OF BENGAL, No. 373-T.A.I., DATED THE 18TH JUNE 1929.

I am directed to refer to your letter No. 682-Agri., dated the 2nd May 1929, in which you ask for a report as to the action proposed to be taken by this Government in regard to the recommendations of the Royal Commission on Agriculture in paragraph 211 of their report that a thoroughly efficient

dairy school should be established as an integral part of one or more Agricultural Colleges and that the curriculum of all Agricultural Colleges should include instruction in cattle breeding, the feeding of dairy cows and the handling of milk.

2. In reply, I am to say that in Bengal there is a scheme for the establishment of an Agricultural Institute at Dacca in which dairying will form an integral part of the curriculum. The Institute scheme is now undergoing examination in the light of the recommendations of the Commission but there is no likelihood of its being taken up at present for want of funds. A separate dairy scheme providing instruction in dairying at the Dacca farm has been administratively approved and is awaiting provision of necessary funds. This scheme will include modern machinery and apparatus of various kinds and provides for instructional courses. It is also in contemplation that when the Institute scheme materialises this dairy will form part of the Institute.

LETTER FROM THE GOVERNMENT OF ASSAM, No. 1493-E., DATED THE 21TH JUNE 1929.

Recommendation of the Royal Commission on Agriculture regarding the establishment of a dairy school as an integral part of one or more agricultural Colleges.

I am directed to acknowledge the receipt of Mr. Reid's letter No. 682-Agri., dated the 2nd May 1929, on the above subject, and to say that the Government of Assam have considered carefully the recommendation of the Royal Commission regarding the establishment of a dairy school. There is no agricultural college in Assam and it is not likely that one will be created for many years to come. This Government have, however, secured the services of a Dairy and Cattle Expert and are conducting experiments in cattle breeding and hope in due course to open more cattle farms and dairies (possibly on co-operative lines) in the province. At present, therefore, the Assam Government are disposed to start a class for training students in animal husbandry and dairying, when one of the Government farms either at Shillong, Khanapara, Jorhat or Sylhet is sufficiently advanced and stocked to admit of practical tuition being given. It is unlikely that a class can be started before 1931.

Meanwhile the Government have arranged to send two students to be trained at the Imperial Institute of Animal Husbandry and Dairying at Bangalore and are giving them scholarships.

LETTER FROM THE GOVERNMENT OF MADRAS, No. 1096-MISC., DATED THE 29TH JUNE 1929.

Recommendation of the Royal Commission on Agriculture.

I am directed to reply to Mr. Reid's letter No. 682-Agri., dated 2nd May 1929, wherein the Government of India enquire what action this Government propose to take on certain recommendations of the Royal Commission contained in paragraph 211 of their report. In that paragraph the Commission recommend, among other things, that a thoroughly efficient dairy school should be established as an integral part of one or more agricultural colleges and that the curriculum of all agricultural colleges should include instruction in cattle breeding, the feeding of dairy cows and the handling of milk. In regard to the latter, I am to state that at the Agricultural College, Coimbatore, the curriculum for the degree course—the only course taught there—includes instruction in cattle breeding, the feeding of dairy cows and the handling of milk and butter making.

2. As regards the establishment of an efficient dairy school, I am to state that there would be no insuperable difficulty in establishing one at Coimbatore, provided it is found necessary. I am, however, to point out that the Royal Commission recommend that a school should be established as an integral part of *one or more* agricultural colleges. Such a school already exists at Allahabad and it will have to be decided whether schools should be established at any other places. This matter appears to this Government to be one for the Council of Agricultural Research to decide, and if the Council decides that one should be opened at Coimbatore the matter will surely be considered by this Government.

COPY OF A LETTER FROM THE GOVERNMENT OF THE CENTRAL PROVINCES, No. 475] 338-XIV, DATED THE 6TH JULY 1929.

I am directed by the Governor in Council to refer to Mr. Reid's letter No. 682-Agri., dated the 2nd May 1929, asking this Government to report what action it proposes to take in regard to the recommendations of the Royal Commission on Agriculture that a thoroughly efficient dairy school should be established as an integral part of one or more agricultural colleges and that the curriculum of all agricultural colleges should include instruction in cattle breeding, the feeding of dairy cows and the handling of milk.

2. In reply I am to say that instruction in cattle breeding and feeding and in the handling of milk dairying is already included in the regular course at the Agricultural College, Nagpur. This Government, as at present advised, does not think it necessary at present to provide for more specialised instruction in dairying technique as there is little demand for such training by students desiring to become instructors in dairying or to take up this industry on modern lines. The position will, however, be re-examined in future should a local demand from prospective dairy managers arise, but for the present the needs of the province in this respect are amply met by a central institution.

COPY OF A LETTER FROM THE GOVERNMENT OF BOMBAY, No. 2670-A.]28, DATED THE 15TH JULY 1929.

With reference to Mr. Reid's letter No. 682-Agri., dated 2nd May 1929, I am directed by the Government of Bombay (Transferred Departments), to state that they have examined the recommendation of the Royal Commission on Agriculture that a thoroughly efficient dairy school should be started as an integral part of one or more agricultural colleges, and that they have come to the conclusion that it is not necessary to provide for the advanced teaching of dairying at the Agricultural College, Poona, as very few students are desirous of qualifying themselves for the Indian Dairy Diploma and as qualifications in dairying do not offer many opportunities for employment. I am to point out that the facilities for such training at Bangalore are abundant and that advantage has been taken of them in the past by a few men from this Presidency. It is the view of the Agricultural Department of this Presidency that the dairy teaching at the Poona College should be confined to the knowledge essential for the ordinary B. Ag. degree course and that there should be a special course suitable for practical men who wish to practise improved dairying methods but who do not wish to take the Indian Dairy Diploma. Proposals are at present under the consideration of the Department for improving the work at the College on these lines. With regard to the second recommendation of the Royal Commission that the curriculum of all agricultural Colleges should include instruction in cattle breeding, feeding of dairy cows and handling of milk, I am to observe that

there is adequate provision for this in the course of the Poona Agricultural College and that advanced animal husbandry and dairying is taught as a special subject in certain classes.

COPY OF A LETTER FROM THE GOVERNMENT OF THE UNITED PROVINCES, No. 613-A.,
DATED THE 23RD JULY 1929.

In reply to Mr. Reid's letter No. 682-Agri., dated 2nd May 1929, I am directed to say that the Government of the United Provinces have had the question of the provision of advanced instruction in animal husbandry and dairying under consideration for some time. There is at present a dairy attached to the Agricultural College at Cawnpore, and elementary instruction in these subjects is included in the four years diploma course of that college; and also in the two years vernacular course of that college, and in the course of instruction given at the Bulandshahr Agricultural School. The Government of India, however, have declined to recognise any of these courses as sufficient for the Indian Diploma in Dairying on the ground that the equipment and staff are at present insufficient.

2. The Allahabad Agricultural Institute, which is a private institution, gives a complete and advanced course in animal husbandry and dairying of the same standard as that given at the Imperial Institute, Bangalore; and the Allahabad Institute is recognised by the Government of India for the Indian Diploma. The institute has applied to the Government of the United Provinces for financial assistance, and the Government consider that it would be cheaper and more satisfactory for them to develop this institute as an institution for advanced instruction for specialists in dairying, and to place it in a position to give efficient training up to the B. Sc. standard rather than to increase the equipment and staff at the Agricultural College, Cawnpore, where the accommodation is already fully occupied by the existing courses. The Allahabad Institute, however, is not at present affiliated to a university, and is experiencing difficulty in securing students of the right type, because they cannot obtain a university qualification at the conclusion of their course, and are therefore handicapped in obtaining employment. The Government's final decision on the question of giving assistance for the development of this institute will depend on it being able to obtain certain facilities from the Allahabad University for the grant of degree in agriculture with special emphasis on animal husbandry.

COPY OF A LETTER FROM THE GOVERNMENT OF BURMA, No. 193-O., DATED THE 4TH
OCTOBER 1929.

Recommendations made by the Royal Commission on Agriculture in paragraph 211 of their Report regarding animal husbandry.

I am directed to reply to your letter No. 682-Agri., dated the 2nd May 1929, on the subject of the above recommendations of the Royal Commission on Agriculture.

2. In reply I am to say that the position of Burma in regard to dairying differs from that of other provinces in India. The rural population of Burma are not generally consumers of milk, butter and other dairy products and there is no demand from the agricultural population for instruction in dairying. Such demand for this instruction as does exist in Burma comes from people engaged in the dairying business in the big towns. In these circumstances, the Government of Burma do not propose themselves to establish a dairy school as an integral part of any Agricultural College in Burma. It would, however, be

advantageous to Burma if an efficient school existed in connection with some Agricultural College in India, since as has already been pointed out, there is some demand for instruction in dairying from those engaged in the dairy business in big towns.

3. As regards the second recommendation that the curriculum of all Agricultural Colleges should include instruction in cattle breeding, the feeding of dairy cows and the handling of milk, I am to say that some instruction in these subjects is already provided for in the curriculum of the Mandalay Agricultural College, while a small dairy herd of Seindhi-bred cattle maintained at the College farm provides opportunities for practical dairying work. For the reasons explained in the preceding paragraph of this letter, the Government of Burma think that the provision already made at the Mandalay Agricultural College for instruction in these subjects is sufficient and they do not think it necessary to alter the curriculum of the College so that increased attention may be given to these subjects.

4. The conclusion is that as far as Burma is concerned no special action is necessary on the two recommendations of the Royal Commission on Agriculture referred to in the letter under reply.

COPY OF A LETTER FROM THE GOVERNMENT OF BIHAR AND ORISSA, No. 207-D. R.,
DATED THE 20TH JUNE 1929.

I am directed to refer to Mr. Reid's letter No. 682-Agri., dated the 2nd May 1929, in which the Government of India ask the local Government to examine the recommendations of the Royal Commission on Agriculture that a thoroughly efficient dairy school should be established as an integral part of one or more agricultural colleges and that the curriculum of all agricultural colleges should include instruction in cattle breeding, the feeding of dairy cows and the handling of milk, and to report what action they propose to take in regard to them.

2. In reply, I am to say that the question of the establishment of an agricultural college in Bihar and Orissa, as recommended by the Royal Commission on Agriculture in paragraph 482 of their report, is now under the consideration of the local Government. It is not possible to say definitely at this stage what the curriculum of the college will actually be, but it is contemplated that instruction in cattle breeding and management, the feeding of dairy cows and the handling of milk will form a part of it.

3. A cattle breeding and dairy farm has already been established at Patna along side the veterinary college, which it is proposed to start next year. The curriculum of the Veterinary College has not yet been definitely decided but it is proposed to provide special facilities for higher training in animal husbandry and it is also proposed to place the cattle breeding and dairy farm directly in charge of the Principal. If the Agricultural College is also established at Patna, it will be possible to train all the agricultural and veterinary students in cattle breeding, dairying and the care of cattle at the farm and eventually to prepare students for the Indian Dairy Diploma. In that case, it will be unnecessary to establish a dairy school as an integral part of the new Agricultural College.

4. The local Government are advised that one or two fully equipped dairy schools in India are likely to prove sufficient for the present to meet the requirements of the small number of students who would be forthcoming. They are also advised that there will be a demand for higher instruction in dairying at Bangalore for some years to come. If the two-year course certificate of an Agricultural College, or its equivalent, were made the minimum qualification for

admission to the Bangalore Indian Dairy Diploma Course, that Institute would perform a valuable function. Future dairy instructors should take the degree course of an Agricultural College and a post-graduate course at Bangalore which may well become the centre for post-graduate training.

COPY OF A LETTER FROM THE GOVERNMENT OF THE PUNJAB, NO. 5729-D., DATED THE 17TH DECEMBER 1929.

I am directed to refer you to your letter No. 682-Agrl., dated the 2nd of May 1929, on the subject of instruction in Animal Husbandry and Dairying, and the recommendations of the Royal Commission in paragraph 211 of their report. The Punjab Agricultural College, Lyallpur, already makes full provision in its curriculum for instruction in cattle-breeding and feeding, handling of milk, dairying, etc., and no further action appears to be called for in this direction in the Punjab.

2. The course at present given in Lyallpur does not qualify for the Indian Diploma in Dairying, but if there ever were a demand sufficient to justify such action, it would not be difficult to raise the standard of instruction to what is required for the Indian Diploma. Until, however, further evidence is forthcoming that such a course, if established, would be appreciated and utilised, the Punjab Government regards such a proposal as less urgent than several others on its programme.

3. There is reason to believe that a short vernacular course lasting about 3 months in practical dairying would prove more popular than a two-years diploma course. Youths, who have been educated up to the Middle Standard, could there be given a useful and practical course in cattle management, feeding and dairying, and would prove of value to large cattle owners and dairy men. Requests for men trained on these lines have on several occasions been received, and the proposal to establish such a course is under consideration.

APPENDIX VIII.

Statement showing the recommendations contained in the Proceedings of the third meeting of the Sugar Committee.

| Serial No. | Item of the Agenda. | Subject. | Recommendation of the Committee. | Action taken. |
|------------|---------------------------------------|--|---|--|
| 1 | Item No. 1 of the Agenda. | Decisions of the Governing Body on the recommendations of the Sugar Committee (2nd meeting). | Noted | No action required. |
| 2 | Item No. 2 (a) of the Agenda. | Award of a prize of Rs. 1 lakh for the design of a satisfactory small power-cane-crusher. | The Committee noted that the Governing Body had decided to drop the proposal but had approved instead a scheme for a grant of annual prizes and medals of a non-competitive nature for agricultural improvements in India. | Ditto. |
| 3 | Item No. 2 (b) of the Agenda. | Application from the Government of Bengal for a grant for experimental work on cane-crushing and gur-boiling plants. | Recommended | Has been dealt with in circulation. |
| 4 | Item No. 3 of the Agenda. | Application from the Government of Bombay for a grant for work at Manjri (Poona). | That arrangements be made which can be expanded and fitted into a general scheme of agricultural research as proposed by the Director of Agriculture, Bombay, for an immediate and co-ordinated attack under unified control of the main problems connected with sugarcane in the Deccan, namely, soil management, the production of better varieties and physiology of the sugarcane plant and to await detailed proposals from the Bombay Government. | Placed before the Advisory Board—vide Subject No. 9 of the Agenda, January 1931 meeting. |
| 5 | Item No. 4 (a) and (b) of the Agenda. | Chain of sugarcane research stations; proposed stations in the United Provinces and the Punjab. | Noted that no scheme had so far come from the United Provinces but that one from Punjab was likely to be submitted in the near future. | No action required. |
| 6 | Item No. 4 (c) of the Agenda. | Assam—application for a grant. | Not recommended | The Assam Government will be informed accordingly. |
| 7 | Item No. 4 (d) of the Agenda. | Bengal—application for a grant. | Recommended | Placed before the Advisory Board—vide Subject No. 7 of the Agenda, January 1931 meeting. |
| 8 | Item No. 5 of the Agenda. | Sugarcane Insect Pests (including the carriers of mosaic) scheme for work at Pusa. | Further examination deferred till the return of Mr. Fletcher from leave. | No present action. Will be placed again before the Sugar Committee after Mr. Fletcher has returned from leave. |

Statement showing the recommendations contained in the Proceedings of the third meeting of the Sugar Committee—concl'd.

| Serial No. | Item of the Agenda. | Subject. | Recommendation of the Committee. | Action taken. |
|------------|----------------------------|---|--|--|
| 9 | Item No. 6 of the Agenda. | Enquiries into the cost of cane and gur production including enquiry into the marketing of gur. | That this enquiry should now be undertaken about February 1931 when the sugarcane season was on. Proposals made in regard to the staff, the area for enquiry and method of control, etc. | Placed before the Advisory Board— <i>vide</i> Subject No. 8 of the Agenda, January 1931 meeting. |
| 10 | Item No. 7 of the Agenda. | Resolutions of Chowdhry Mukhtar Singh. | As regards the geological and chemical survey of the sugarcane growing area, it was agreed that, if possible, information as to the cost of such surveys in Java and the United States of America and the length of time taken by them should be ascertained and the subject discussed at a future meeting of the Committee. In regard to finding of best means of providing water facilities for sugarcane cultivation, the discussion showed that irrigation practice varied from province to province and the question was really one which could only be adequately dealt with by the proposed Central Board of Irrigation. | Necessary action is being taken. |
| 11 | Item No. 8 of the Agenda. | Co-opting of a representative of the Bihar Planters' Cane Growers' Association. | Not recommended | The Bihar Planters' Cane Growers' Association will be informed accordingly. |
| 12 | Item No. 9 of the Agenda. | Reference to the Tariff Board of the question of the protection for sugar industry. | The Committee decided to leave further action in regard to the Tariff Board enquiry to the Chairman. | The Vice-Chairman deputed the Agricultural Expert to give evidence before the Tariff Board on behalf of the Council. |
| 13 | Item No. 10 of the Agenda. | Mr. Sanyal's report on Hadi's open pan sugar manufacturing process. | The Committee were of opinion that what was now required was a test of the Hadi process over a whole season under commercial conditions side by side with the Rohilkhand <i>test</i> . They recommended that the test on a commercial scale under the supervision of Lala Har Sahai Gupta should be financed by the Council subject to the Chairman's scrutiny of the proposed expenditure with a view to cutting down the total cost (Rs. 10,000). | The test is being conducted with the sanction of the Governing Body. |

APPENDIX IX.

Letter from R. S. Finlow, Esq., C.I.E., B.Sc., F.I.C., Director of Agriculture, Bengal, to the Secretary to the Government of Bengal, Department of Agriculture and Industries, No. 7986-A., dated Ramna, Dacca, the 2nd May 1930.

I have the honour to say that, in addition to the items already submitted for discussion at the coming meeting of the Provincial Research Council, I beg to add another scheme for the provision of a sugarcane seedling testing station for Bengal. The work of the Agricultural Chemist is leading us to the conclusion that Bengal conditions of soil, climate, etc., are more suitable than most in India, for the successful cultivation of sugarcane and, on this account, it may prove to be the case that Bengal will be able to compete with Java in the production of sugar, without the virtual protection which freightage on the 300-600 miles lead from Calcutta to Bihar and the United Provinces respectively gives to these Provinces.

One important point which the scheme involves is that canes which have proved suitable for the Punjab, the United Provinces, and even for Bihar, have not always done well in Bengal, or *vice versa*. The 2nd point is that all the above-mentioned provinces have schemes for establishing cane seedling testing stations which they are asking the Imperial Research Council to finance. Bengal with all its proved potentialities must not be left behind.

The area under cane in Bengal, which is about 200,000 acres, has increased in recent years owing to the introduction of high yielding canes—latterly Co.-213. Formerly Bengal imported about 200,000 maunds of *gur* per annum, but increased area and higher yield appear to have given the Presidency an exportable surplus.

The scheme, details of which will follow, is inexpensive. The total cost for several years will probably be within Rs. 10,000 and it may be taken for granted that the results will be out of all proportion.

Details of the scheme will be submitted immediately. The above is merely to justify inclusion of the item on the agenda for the coming meeting.

Letter from R. S. Finlow, Esq., C.I.E., B.Sc., F.I.C., Director of Agriculture, Bengal, to the Secretary to the Government of Bengal, Department of Agriculture and Industries, No. 8034-A., dated Ramna, Dacca, the 3rd May 1930.

In continuation of my letter No. 7986, dated the 2nd May 1930, I have the honour to enclose herewith a rough estimate of the expenditure involved in setting up the sugarcane seedling testing station at Dacca. The scheme and estimate should be included in the agenda for the forthcoming meeting of the Bengal Provincial Research Council.

ESTIMATE OF EXPENDITURE INVOLVED IN SETTING UP A SMALL SUGARCANE SEEDLING TESTING STATION AT AGRICULTURAL RESEARCH STATION, DACCA.

Land:—About 5 acres in the Dacca Farm for which no charge would be incurred.

Non-recurring expenditure.

Buildings—

| | Rs. |
|--|-------|
| One corrugated iron shed for tools, etc. | 650 |
| Fencing | 700 |
| | <hr/> |
| Total non-recurring expenditure | 1,350 |
| | <hr/> |

| Recurring expenditure. | | Rs. | |
|--|-------|---------------|-------|
| 1 Field Assistant at Rs. 160 | .. .. | 1,920 | p. a. |
| 1 Mali at Rs. 35 per mensem | .. .. | 420 | |
| Total recurring expenditure for one year | | 2,340 | |
| Total recurring expenditure of five years | | 11,700 | |
| Total estimated cost for five years | | 13,050 | |

Extract from proceedings of the third meeting of the Sugar Committee appointed by the Imperial Council of Agricultural Research, held at Poona in August 1930.

The Committee considered a Sugarcane Seedling Testing Station at Dacca to be necessary and recommended that the scheme (Appendix I) submitted by the Bengal Government costing Rs. 1,350 non-recurring and Rs. 11,700 recurring spread over five years or a total of Rs. 13,050 be sanctioned. In this connection Mr. Sarangdhar Das enquired whether a Sugarcane Seedling Testing Station was not necessary for Orissa also. Mr. Burt replied that the proposed sugarcane station in Bihar would supply seedlings to the six experimental farms in Orissa. Rao Bahadur Venkataraman said that as far as he knew conditions in Orissa were entirely different from those in Bihar. It was agreed that enquiries should be made from the Government of Bihar and Orissa as to what they proposed to do in order to meet the needs of the sugarcane tract in Orissa.

Mr. Walchand Hirachand said that judging from what the Sugar Committee had seen on its visit on the 10th to the Belapur Sugar State he considered that a seedling testing for Bombay was also necessary. Mr. Main replied that the question of the establishment of a sub-station of Coimbatore in the Bombay Daccan was now under discussion between the Imperial Sugarcane Expert and himself.

APPENDIX X.

SCHEME FOR AN ECONOMIC ENQUIRY INTO THE COST OF SUGAR-CANE PRODUCTION IN THE UNITED PROVINCES, NORTH BIHAR, BOMBAY AND THE PUNJAB.

In paragraph 6 of their *interim* report, the Sugar Committee appointed by the Imperial Council of Agricultural Research considered the question of the cost of production of sugarcane in different parts of India. They came to the conclusion that the results of such an enquiry would be of value to the Council by enabling it to decide in what areas the sugarcane industry has the best prospects of development and in what places, and in what manner, funds for research and experimental work could best be allotted. They added that an enquiry of this nature must necessarily be conducted by a special staff which would include :—

- (1) An Economist to plan the enquiry, assist in the drafting of the questionnaire and work out the details ;
- (2) An Assistant Economist in each tract to control the work of the investigators ;
- (3) Three village investigators for each tract under study to make the Primary village enquiries.

After describing the general scheme of the enquiry, they recommended that no action should be taken in this matter till they had considered it further at their next meeting (January 1930).

2. The Committee were unable to dispose of this question at their *second* meeting held at New Delhi in January 1930 ; it was accordingly considered at the third meeting of the Committee held at Poona in August 1930. Attention is invited to paragraph 8 of their Proceedings of the 11th August 1930 (Enclosure I). There was a general consensus of opinion in the Committee that this enquiry should now be undertaken at the earliest possible moment. No change was recommended in the special staff except that the number of village investigators was raised from three to four for each province in order to provide for investigations in both irrigated and non-irrigated sugarcane areas for the four tracts, *viz.*, the United Provinces, North Bihar, Bombay and the Punjab. A rough estimate of the expenditure involved in the enquiry is also attached (Enclosure II). It is proposed that the enquiries should commence in December 1931.

3. The proposal is now submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

The 4th December 1930.

ENCLOSURE I.

Extract from the Proceedings of the Third Meeting of the Sugar Committee, appointed by the Imperial Council of Agricultural Research, held at Poona on the 11th and 13th August 1930.

8. *Enquiries into the cost of cane and gur production including enquiry into the marketing of gur.*—There was a general consensus of opinion in the Committee that this enquiry should now be undertaken at the earliest possible moment which would be about February 1931 when the sugarcane season was on. Proposals in regard to the conduct of the enquiry had already been formulated by the Committee at its first meeting in October 1929 and as it was felt that the appropriate time of enquiry was now approaching it was time to make concrete proposals in regard to the staff.

It was decided to leave the choice of the Economist who would plan the enquiry to the Chairman. A good Economist preferably with agricultural experience was what was required. The pay would have to depend upon the person selected but it was felt that it should not exceed Rs. 1,500 per mensem. The Economist should be engaged for one year with option on either side to extend his appointment to another year.

At its first meeting the Sugar Committee recommended that the four sugarcane areas selected for the enquiries should be Meerut, North Bihar, Bombay and the Jullundur District of the Punjab. It was now decided not to mention any particular place but to define the areas as the United Provinces, North Bihar, Bombay and the Punjab leaving the actual tracts to be decided upon later in consultation with the Director of Agriculture of the province concerned when the Economist joined.

As for the Assistant Economists of which there would be four it was felt that they should be Honours Graduates in Economics with some research experience the pay depending upon the person selected but not to exceed Rs. 350 per mensem.

In the original proposals three investigators were suggested for each tract. It was now pointed out that in order to provide for irrigated and non-irrigated sugarcane areas in each of the four provinces four investigators for each province instead of three would be required. These would be Agricultural College Graduates with experience of district work, especially sugarcane work. The pay of each would depend upon the man selected but it should not exceed Rs. 200.

In the matter of the control the Chairman suggested that the work should be conducted through the local Agricultural Departments. The Assistant Economists and the Investigators would be under the administrative control of the Director of Agriculture, the Economist in charge of the whole scheme who would be under the Council acting in consultation with the Directors of Agriculture concerned. This was agreed to as well as the suggestion that detailed arrangements might be left for adjustment after the Economist had joined. The Economist would be required a month or two before the local investigation started. Mr. Clark added a rider that the administrative control of the Directors of Agriculture over the subordinate staff as well as the fact that the Chief Economist would act in consultation with Directors of Agriculture should not in any way detract from the latter's responsibility for the whole enquiry. He should be finally responsible for its conduct. This was agreed to.

ENCLOSURE II.

Estimated cost of enquiry into the cost of production of sugarcane--1st year.

| | Rs. | Rs. |
|--|--------|----------|
| *Economist @ 1,500 for 15 months | 22,500 | |
| Travelling allowance | 2,500 | |
| | <hr/> | 25,000 |
| 4 Assistant Economists @ 350 for 15 months | 21,000 | |
| Travelling allowance | 4,000 | |
| | <hr/> | 25,000 |
| 16 Investigators @ 200 for 12 months | 38,400 | |
| Travelling allowance @ 500 each | 8,000 | |
| | <hr/> | 46,400 |
| Contingencies | | 1,600 |
| Printing of questionnaire books and forms | | 2,000 |
| | | <hr/> |
| | | 1,00,000 |
| The rates of pay shown are the maximum approved by the Committee and we hope for some saving especially on investigators whose average pay should not exceed above 150—a saving of 9,600 | | |
| | | -9,600 |
| Clerical staff for compilation (investigators will be required to assist) say 6 temporary clerks on about 60 per mensem for 6 months (2,160) | | |
| | | +2,160 |
| | | <hr/> |
| Total (say) | | 92,560 |
| | | <hr/> |

*Assuming that the enquiry lasts 1 whole season, he will be need for 3 months extra at least.

APPENDIX XI

Sugarcane research scheme for the Bombay Deccan.

At their first meeting held at New Delhi in October 1929, the Sugar Committee appointed by the Imperial Council of Agricultural Research considered the question of a sugarcane research station in the Bombay Deccan. As, however, the detailed scheme relating to it had not been received from the Government of Bombay, the Committee decided to defer its examination until their second meeting held in January 1931. At that meeting no details of the proposed scheme for a sugar research station were received but a scheme of work in sugarcane Physiology was put forward. The Sugar Committee decided that their third meeting should be held at Poona in August 1930 in order that the special needs and problems of the Deccan Canal area might be discussed with the Director of Agriculture, Bombay, and other officers nominated by the Local Government. After consideration in August 1930, the following resolution was passed by the Committee :—

“ That the Committee recommends that arrangements be made, which can be expanded and fitted into a general scheme of agricultural research as proposed by the Director of Agriculture, Bombay, for an immediate and co-ordinated attack under unified control of the main problems connected with sugarcane in the Deccan, namely, soil management, the production of better varieties and the physiology of the sugarcane plant and to await detailed proposals from the Bombay Government ”.

2. These detailed proposals are contained in the attached sugarcane research scheme for the Bombay Deccan received from the Government of Bombay. The total cost of the scheme over a five-year period is estimated at Rs. 5,22,088 made up of Rs. 67,918 non-recurring and Rs. 90,834 per annum or a total over five years of Rs. 4,54,170 recurring. The Bombay Agricultural Department will be able to contribute Rs. 1,30,850 towards the scheme if it is accepted in *full* as then the staff and budget of the present Manjri Experimental farm would be devoted to the scheme. In that case, the nett cost of the scheme will be Rs. 3,91,238 for 5 years.

3. It will be noticed that the scheme contains a provision of Rs. 23,000 a year under “contingencies” for cultivation and management of 100 acres of land. The scheme provides that 30 acres of cane should be cultivated annually; even at Rs. 20 per *palla* (the Director of Agriculture's lowest price) and 36 *pallas* per acre; this means receipts to the farm of Rs. 21,600 per annum without allowing for subsidiary crops, whilst expenditure has, as stated above, been budgeted in full at Rs. 23,000 a year. Actually, the farm should be practically self-supporting, *i.e.*, contingencies would be covered by receipts. If that is so the nett cost of the scheme would be reduced by Rs. 1,15,000 to Rs. 2,76,238.

4. The scheme is now submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

SUGARCANE RESEARCH SCHEME FOR THE BOMBAY DECCAN
(INCLUDING ROTATION CROPS).

INTRODUCTORY.

In August 1930 the Sugar Committee of the Imperial Council of Agricultural Research, at its session in Poona, passed the following resolution :—

“That the Committee recommends that arrangements be made, which can be expanded and fitted into a general scheme of agricultural research as proposed by the Director of Agriculture, Bombay, for an immediate and co-ordinated attack under unified control of the main problems connected with sugarcane in the Deccan, namely, soil management, the production of better varieties and the physiology of the sugarcane plant and to await detailed proposals from the Bombay Government.”

The Sugar Committee further expressed the view that sugarcane research should be located at a place which is representative of the environmental conditions obtaining in the Deccan Canals Zone, and considered that a site more representative than Manjri Experimental Station, should be selected. This latter stipulation has materially affected the estimates because a research scheme located at Manjri would naturally be very much cheaper than at some entirely new centre. If, however, this scheme is sanctioned in the form in which it is put up, it is proposed to make the staff and budget of the Manjri Experimental Station available as a Provincial contribution to the scheme. For this purpose it is proposed to close the Manjri Experimental Station, at least temporarily. This will not, of course, be possible if the scheme as a whole is not sanctioned as in that case Manjri would still be required.

THE PROBLEM.

The Deccan suffers from a very precarious rainfall, and history records a series of severe famines while scarcity years, in one or other part of this tract, are seldom, if ever, absent.

Owing to the geographical features of this part of India it so happens that a range of mountains fringes the Deccan on its Western frontier where the rainfall is not only excessive, ranging from upwards of 100 to over 200 inches, but is assured. It was therefore natural for Government to turn its attention to the problem of making, at least, some of this water available for irrigation in the arid Deccan.

The total areas* of land on the seven principal completed canals are :—

| | Acres. |
|------------------------------|-----------|
| Commanded gross | 1,336,721 |
| Commanded culturable | 1,076,938 |
| Irrigable | 401,770 |
| Annual Irrigation | 187,909 |

The completed works only represent about one-third of the programme, (*i.e.*, completed *plus* projected schemes).

It is understood that His Highness the Nizam of Hyderabad has under consideration an important irrigation project, but his advisers have some misgivings on account of the difficult problems which have confronted the Bombay Government in developing irrigation in the Deccan.

The problem of developing Peninsular India (where natural facilities exist) through irrigation is, in fact, a very formidable one, apart from certain rice tracts. On the other hand the country stands in great need of irrigation owing to the precarious character of the rainfall as already remarked. In this connection attention may be directed to the description of the East Deccan in the report of the Bombay Provincial Banking Enquiry Committee, and it is

* *Vide* part II of the Irrigation Administration Report for 1927-28. The last figure is an average for five years taken from the Administration Reports for 1923-24 to 1927-28 (Statement III-E).

understood that a very similar state of affairs exists in tracts beyond the Bombay boundary.

Experience shows that it is not sufficient to build canals and place water within the reach of the cultivator. Unlike the cultivator of Indo-Gangetic India the cultivator of the Deccan finds it difficult to exploit canal irrigation facilities. His land is undulating and requires considerable outlay to make it fit for irrigation. The types of soil and subsoil and their depths vary very much, rendering irrigation, at least in the initial stages, a rather complicated affair.

It has, however, been ascertained that the Deccan is one of the finest sugarcane tracts in the world provided proper judgment in choosing the soil and in managing the crop is shown. In particular the climate is very favourable to cane, and prolific crops of the superior thick soft canes can be produced. The great obstacle in the way of this crop has been the high cost of production, incurred by the average cultivator. This has placed the Deccan at a great disadvantage as compared with Northern India, as a cane-field. As an indication of the capacity of the Deccan to grow cane it may be pointed out that the average yield of gul on the Manjri Experimental Station over an area of not less than 10 acres over a period of 16 years has been 9,334 lbs. per acre, which is just over 4 tons per acre.

Apart from its own intrinsic merits cane has a special value in Irrigation—Agriculture in Peninsular India. It has provided the stimulus to agriculturists to make their lands fit for irrigation by levelling and generally laying them out. It has also been the cause of grading-up the condition of the soil through heavy applications of bulky manures. In fact it is generally admitted that a limited area of cane is, in practice, an indispensable factor in the development of canal agriculture.

Owing to several reasons, including the hitherto high cost of production, the total area of cane on the main canals in the Deccan has never exceeded 35,000 acres. But for reasons explained above the acreage is no criterion of the importance of the crop in the agriculture of the countryside. Moreover, in point of value, even this small area of crop means an annual crop-value of over two crores of rupees.

The cost of production by cultivators of cane is about 10½* annas per maund (Bengal) for plant cane as given in detail below in rupees per acre for a crop of 900 Bengal maunds of stripped cane :—

| Serial No. | Operation. | Amount. |
|------------|--|-----------|
| | | Rs. A. p. |
| 1 | Ploughing, pulverising, ridging, disoing and levelling | 40 0 0 |
| 2 | Bunding, making channel and dressing ends | 12 8 0 |
| 3 | Sets 12,000 or 8 per cent. on an acre of cane of 33 tons | 46 12 0 |
| 4 | Cutting, supplying, arranging and planting | 10 0 0 |
| 5 | Weeding | 20 0 0 |
| 6 | Earthing up | 10 0 0 |
| 7 | Farm yard manure 40 carts at Rs. 2-4-0 each | 90 0 0 |
| 8 | Cake groundnut=202 lbs. N. or 12 pallas at Rs. 81 per ton (May-June 1930) (supplying 7 per cent. N.) | 104 0 0 |
| 9 | Sulphate of Ammonia 224 lbs. at Rs. 170 per ton. N=45 to 47 lbs. | 17 0 0 |
| 10 | Powdering and applying | 7 0 0 |
| 11 | Water Rate | 50 0 0 |
| 12 | Labour for irrigation | 20 0 0 |
| 13 | Cutting, stripping, bundling and carting | 35 0 0 |
| 14 | Interest at Rs. 9 per cent. on Rs. 375 (half annual investment). | 33 12 0 |
| 15 | Supervision | 30 0 0 |
| 16 | Rent (Rs. 90 for 3 acres of which two-thirds is debited to cane) | 60 0 0 |
| | Total | 586 0 0 |

* Calculated on the basis of contract and hired labour on a 10-anna wage.
L928ICAR.

Some years ago the cost of production was much higher. The question to-day, however, is how far can "costs" be further brought down.

The Bombay Department of Agriculture has done a considerable amount of work on this problem and has succeeded in bringing down the cost of production to approximately—

- annas 8 per maund at Manjri for plant cane,
- annas 7 per maund at Kopargaon for plant cane, and
- annas 6 per maund at Kopargaon for ratoon cane.

These prices are based on a 10-anna wage standard at Manjri and 8 annas at Kopargaon, but peasant-cultivators would probably be satisfied with lower wages.

If we assume that the cost of cane is 10½ annas per maund (Bengal) then the cost of gul will be Rs. 19-13-6 per palla (of 250 lbs.) or Rs. 175-12-0 per ton.

At Belapur where the cost of cane, including haulage is approximately 11 annas per Bengal maund the cost of sugar is approximately Rs. 9-8-0 per Bengal maund or Rs. 259 per ton.

The expansion of cane cultivation, which in turn governs the expansion of irrigation, in the Deccan which possesses such great natural advantages, obviously depends upon the profits to be made out of

- (a) the gul industry or
- (b) the sugar industry or both.

There is a general consensus of opinion that the market for Deccan gul is saturated for a price level of Rs. 20 to 25 per palla (of 250 lbs.) of gul. If this is accepted then there is no scope for expanding the cane area on a gul-basis unless the cost of producing gul can be brought down, substantially below Rs. 20 per palla.

As regards sugar the cost figure of Rs. 9-8-0 per Bengal maund, mentioned above, is still considerably higher than the North of India cost, and hence if Peninsular India is to become an important sugar-producing country it is necessary to bring down the cost of production still further.

For these reasons it is necessary to undertake much more fundamental research than has been possible in the past on the Manjri Experimental Station where the staff belongs to the Subordinate Service. Moreover, sugarcane research necessarily implies work on the rotation crops when economics is the central issue involved.

In the following section an attempt is made to indicate the field for fundamental research and incidentally to describe the research which has already been carried out on the Manjri Experimental Station.

It may be useful, however, to draw attention to the main factors through which it is hoped to effect a further reduction in "costs". These are (1) an improved variety of cane and (2) a further reduction in the quantity of manure used. There is also the wages-rate of 8 to 10 annas per man per day which may fall.

Hitherto a great variety of canes have been tested at Manjri, but none appear to be a better cultivator's cane than the local Pundia. However, certain

recently introduced canes at Belapur like E.K. 28 and P.O.J. 2878, which are also under trial at Manjri, are very promising. Our chief hope, however, appears to lie in the breeding of an improved cane specially for the Deccan.

The Imperial Sugarcane Expert at Coimbatore has for the last four years been giving his attention to the production of a "Noble" cane suitable for the Deccan; and he is now in a position to provide some material for trial. A further reference to this work will be found in the next section, but if the yield can be increased by 20 per cent. through an improved cane, without involving increased expenditure, the cost of a Bengal maund of plant-cane will fall from 8 annas to 6.4 annas on the Manjri figures and to 5.6 annas on the Kopargaon figures.

THE FIELD FOR FUNDAMENTAL AGRICULTURAL RESEARCH IN THE CANAL TRACTS OF THE BOMBAY DECCAN.

The following examples of the type of research required are given by way of illustration.

I.—The Soil.—The soil in the irrigated tracts is very variable in character as well as in depth, and experience shows that the soils behave very differently under irrigation. The whole subject of the reaction of different types of Deccan soils to irrigation requires to be investigated scientifically.

It is necessary to determine much more accurately, than has been possible in the past, just what degree of irrigation-intensity a particular soil or soil-condition can stand without sustaining injury.

Equally important is the investigation of counter treatment to prevent or at least control the injurious effects of irrigation on certain soil types. Farm practice, with this object in view, should be based on investigation by a Soil-physicist. At present the following precautions are taken by the Irrigation Department :—

- (1) Disallowing sugarcane on the less suitable lands.
- (2) Enforcement of hot-weather fallows in the sugarcane blocks.

The landowner, however, is justified in expecting something more than negative action on the part of Government. It is no doubt an effective means of preventing soil damage to prohibit a man from cultivating cane, but this imposes some responsibility on Government to advise him what crops can advantageously be grown on such prohibited lands and what treatment he can advantageously adopt to prevent his soil becoming damaged from a medium intensity of irrigation. The right treatment seems *inter alia*, to lie in the adjustment of the application of organic manures to the degree of damage sustainable from irrigation by a particular soil-type and in the right use of fallows and rotations.

Moreover from the standpoint of the landowner it is very important that no land should be put in the unprivileged class unless there is convincing scientific evidence justifying that classification because this determines the sale and rental value of the land and is thus a matter of vital importance to the owner.

The interests of the agriculturist therefore demand fundamental research in soil-physics.

II—Improved Varieties of Cane.—A large amount of varietal work on cane has been done at Manjri and striking results have been obtained with certain

introduced varieties particularly as regards tonnage and sucrose content as may be gathered from the following statement :—

| Serial Number. 1 | Name of variety. 2 | Growth period in months. 3 | Arrowing or not. 4 | Tonnage. | | Extraction. | | Gul. | |
|---------------------|-----------------------|-------------------------------|-----------------------|---------------------|----------------------|------------------|----------------------|------------------------|--|
| | | | | Cane per acre. 5 | Order of merit. 6 | Percentage. 7 | Order of merit. 8 | In tons per acre. 9 | Relative yields taking the yield of Pundia at 100. 10 |
| 1 | Pundia .. | 12-13 | Non-arrowing | 30-80 | 7 | 69-8 | 3 | 4-25 | 100 |
| 2 | D. 109 .. | 12-12½ | Arrowing .. | 36-20 | 5 | 64-5 | 6 | 4-16 | 97-8 |
| 3 | Striped D. 109. | 12-13 | Arrowing .. | 36-65 | 4 | 70-1 | 2 | 4-49 | 105-6 |
| 4 | H. M. 89 | 12-13 | Arrowing .. | 31-59 | 6 | 66-0 | 4 | 4-34 | 102-1 |
| 5 | H. M. 310 | 12-13 | Non-arrowing | 38-31 | 2 | 65-2 | 5 | 4-22 | 99-3 |
| 6 | H. M. 544 | 14-14½ | Non-arrowing | 38-78 | 1 | 70-3 | 1 | 4-39 | 103-5 |
| 7 | J. 213.. | 12-12½ | Arrowing .. | 36-91 | 3 | 57-3 | 7 | 4-11 | 96-7 |

| Serial Number. 1 | Name of variety. 2 | Gul. | | Sugar. | | | Juice. | | | |
|---------------------|-----------------------|----------------------|----------------|----------------------------------|---|-----------------------|---------------------------------|-------------------------|---------------------------|---------------|
| | | Order of merit 11 | Quality. 12 | Sucrose per cent. on cane. 13 | Available sugar in tons per acre. 14 | Order of merit. 15 | Brix corrected to 17-500. 16 | Sucrose per cent. 17 | Glucose percentage. 18 | Purity. 19 |
| 1 | Pundia .. | 4 | A | 15-44 | 3-75 | 7 | 20-66° | 18-35 | 1-37 | 83-82 |
| 2 | D. 109 .. | 6 | A | 13-86 | 3-76 | 6 | 19-1° | 16-95 | 1-08 | 83-76 |
| 3 | Striped D. 109. | 1 | A Superior. | 14-68 | 4-43 | 1 | 19-49° | 17-89 | 0-98 | 91-79 |
| 4 | H. M. 89.. | 3 | A do. | 16-64 | 4-01 | 3 | 21-98° | 20-04 | 0-62 | 91-16 |
| 5 | H.M. 310.. | 6 | A | 14-19 | 3-88 | 6 | 18-41° | 16-33 | 1-16 | 83-72 |
| 6 | H.M. 544.. | 2 | A Superior. | 13-67 | 4-32 | 2 | 18-34° | 16-53 | 1-21 | 90-14 |
| 7 | J. 213.. | 7 | A | 14-83 | 3-94 | 4 | 20-3° | 19-77 | 0-48 | 94-43 |

Note.—The available sugar figures in column 14 are on the basis of actual extraction obtained and given in column 7 of the statement.

Unfortunately, however, all these varieties have one or more disabilities which prevent them replacing Pundia. For example Striped D 109 arrows and hence is unsuitable for adsali cultivation, while H. M. 544 is later in maturing than Pundia by about two months.

In these circumstances it seems essential to undertake sugarcane breeding with the special object of evolving a high class cane suitable for the Deccan, which is more economic than Pundia. The Imperial Sugarcane Expert at Coimbatore has already started breeding operations on "noble" canes, and it is hoped that an improved cane will soon emerge from his operations. It is, however, essential that arrangements be made in the Deccan for the testing of a huge number of Coimbatore seedling canes, from the very early stages in the evolution of these canes. It is suggested that these operations should form an important integral part of this Research Scheme.

III—Water-requirements of Sugarcane and Rotation Crops.—A good deal of field experimental work has been done on the water-requirements of sugarcane while very little has been done on other crops. This is a subject which requires searching investigation of a much more exact character than is possible in fixed experiments. One of the bases on which the water-requirements of a crop depends is the water requirements of a fully developed single plant. When this is known and when the unavoidable losses due to evaporation and drainage, etc., have been accurately determined it is possible to form a fairly correct estimate of the requirements of an acre of crop. The general tendency in the Deccan, as in other parts of India, is to overwater the crop; and this is particularly so with sugarcane. It is, however, a matter of great importance to Government that water which costs so much shall not be wasted in this way.

Then there is the fact that the brix of cane juice varies with the method of irrigation, but this requires further detailed investigation.

Hence there is a big field for valuable research by a plant-physiologist in determining the water requirements of crops, both in the aggregate and at different periods of growth.

IV—Manurial-requirements of the Sugarcane Rotation.—Irrigated crops demand manure and there is a great field for determining the most suitable fertilizers, the quantities per acre and the mode and time of application. A good deal of field experimental work has been done, especially in connection with sugarcane. It is widely held that the agriculturist over-manures his cane. Formerly top-dressings of three or four hundred lbs. of nitrogen per acre of cane were usual and even now, with a depressed gul market, it is found that top-dressings of 250 lbs. of nitrogen per acre are being applied. Here again there is a wide field for research by a physiologist who would determine the precise quantities of nitrogen absorbed by normally developed plants and the ultimate destination of the manure applied to the land in other words what is taken up by the crop and what is drained away in the water and what becomes dissipated and what remains over in the soil. Manure also reacts upon the quality of certain products such as gul. This also demands research.

V—Improved Cultural Methods.—The method of growing sugarcane has been transformed as the result of investigations on the Manjri Farm. The old method consisted of short shallow furrows 2 to 2½ feet apart, enclosed in beds, requiring 18,000 sets per acre. The new method consists of long furrows ranging from 3½ to 5 feet apart according to circumstances and requiring 10,000 sets. Work is also in progress to determine the best way to grow cotton under irrigation. But there is still much scope for useful investigation, e.g., the best dates for sowing crops like cotton and groundnuts require further investigation.

VI—Sugarcane Economics.—Cost of production of sugarcane is a matter of vital importance. The cost of producing cane is high in these tracts. If the Deccan is to compete with Northern India as a sugar producer it is necessary to bring down the cost of cane. The "Manjri System" of cultivation has already achieved considerable success in this direction. In particular there is a great reduction in the amount of manure used, e.g., the nitrogen in the top-dressing is 150 lbs. per acre as against 250 and above on cultivators' fields. This quantity of nitrogen, 150 lbs. has for the last 5 years has been associated

with yields of 9,723 lbs. of gul (39 pallas) per acre on the Manjri Farm as against 9,867 lbs. obtained from top-dressings of 300 lbs. of nitrogen. Experiments are in progress with still smaller doses of nitrogen. It is obvious that the optimum dose must depend upon the market prices of fertilizers and of gul. Further investigation along these lines is required and the work should be extended to other important crops like cotton, wheat and groundnuts.

Every effort is also necessary to reduce the labour bill by substituting bullock power for manual power wherever possible.

Again farm yard manure is very scarce in many localities and in such places sann grown as a green manure is found to be more economical. Other green manures like daincha are under investigation.

Another field for investigation is the possible association of some form of stock farming with crop growing in the canal tracts. Promising results are being obtained with berseem (Egyptian clover) and this makes an excellent fodder for dairy buffaloes. Experiments on a substantial scale would yield very valuable information and might lead to the adoption of "mixed farming".

The best plan of management for a holding depends to a considerable extent upon its size. A practice which is suitable for a peasant holding may not be suitable on a large holding, and here again there is scope for useful work.

VII—Agricultural Requisites.—Much useful work has been done on field implements, especially ploughs and on crushers, both bullock-power and engine-power. The field for further investigation is wide.

Experiments have been commenced in manufacturing synthetic manure from the trash and cane stubbles, but further investigation is necessary.

THE SCHEME.

It should be obvious from what has been said that the problem of sugarcane, and its rotation crops, in the Deccan Canal tract, is one which can only be tackled adequately on a wide front. A simultaneous attack should be made in the following spheres :—

1. Soil-physics.
2. Sugarcane physiology.
3. Sugarcane breeding.
4. Economics.

As regards sugarcane breeding it has already been pointed out that the primary stage (including hybridization) can probably best be carried out at Coimbatore by the Imperial Sugarcane Expert, but the rest of the work including the testing of seedling canes should be carried out in the Deccan. This testing work can accordingly suitably be included in the programme of the agriculturist officer who deals with the Economics Section. Hence it is proposed to organize this research scheme on the basis of one highly qualified officer assisted by two colleagues. These three officers will deal with soil-physics, sugarcane physiology and agriculture-proper respectively. The important details of

- | | |
|----------------|--------------------|
| 1. Site ; | 4. Equipment ; and |
| 2. Staff ; | 5. Estimates. |
| 3. Buildings ; | |

are dealt with below and it is suggested that the period of the scheme should be five years in the first instance.

SITE.

It is necessary that a site be chosen which is representative of the following environmental conditions of the Deccan Canals tract—

Soil

Rainfall

Temperature

Humidity

and that there should be adequate perennial irrigation facilities.

The Sugar Committee considered that Manjri, where the Department has its Experimental Farm, does not sufficiently provide these conditions and that a more representative site on one of the larger canals should be selected. The most suitable locality is considered to be in the vicinity of *Phaltan* or *Malsiras* on the New Nira Right Bank Canal.

One of the special factors in the situation in the diversity of the soils met with in the tract and it is important that the chosen site should include representative types.

It is considered that provision should be made for 30 acres of cane annually so as to provide for the large programme of work that is contemplated and to permit of repetition of some of this work on different soil-types. For these reasons a plot having an area of not less than 100 acres will be required.

STAFF.

As already indicated it is proposed to set up a temporary organization consisting of three sections, as noted below, each in charge of an officer. The senior officer would in addition be responsible for the whole scheme:—

I. Agriculture-proper.

II. Soil-physics.

III. Sugarcane-physiology.

These sections would require the following staff:—

| | Rs. |
|---|-------|
| <i>Staff required in the Agricultural Section proper:—</i> | |
| 1 Officer in class I, Provincial Agricultural Service starting on | 1,000 |
| 3 Graduate Assistants— | |
| 1 Senior in Grade I, Subordinate Agricultural Service (Rs. 220—10—300) starting on | 230 |
| 1 Junior in Grade III, Subordinate Agricultural Service (Rs. 105—5—140) starting on | 125 |
| 1 Junior in Grade III, Subordinate Agricultural Service (Rs. 105—5—140) starting on | 105 |
| 3 Non-graduate assistance in the grade of Rs. 30—5\|2—60 | |
| 1 Starting on | 50 |
| 1 Starting on | 45 |
| 1 Starting on | 30 |
| 1 Store-keeper on Rs. 30—5\|2—80 starting on | 55 |
| 1 Engine driver on | 60 |

| | Rs. |
|--|-----|
| <i>Staff required in the Soil-physics section :—</i> | |
| 1 Officer in class I of the Provincial Agricultural Service starting on | 400 |
| 2 Graduate Assistants— | |
| 1 Senior in Grade I of Subordinate Agricultural Service (Rs. 220—10—300) starting on | 220 |
| 1 Junior in Grade II, Subordinate Agricultural Service (Rs. 150—5—200) starting on | 150 |
| 1 Non-graduate Assistant on Rs. 30—5½—80 starting on .. | 40 |
| 2 Laboratory boys on Rs. 18 per mensem starting on .. | 18 |
| <i>Staff required for the Sugarcane-physiology Section :—</i> | |
| 1 Officer in class I of the Provincial Agricultural Service starting on | 400 |
| 1 Graduate Assistant of Grade I, Subordinate Agricultural Service (Rs. 220—10—300) starting on | 220 |
| 2 Non-graduate Assistants (Rs. 30—5½—80) starting on .. | 40 |
| 2 Laboratory-boys on Rs. 18 per mensem starting on .. | 18 |
| <i>Staff required in office section :—</i> | |
| 1 Head clerk accountant on Rs. 105—5—140 starting on .. | 105 |
| 1 Junior clerk on Rs. 30—5½—80 starting on | 40 |
| 1 Naik on Rs. 20 | 20 |
| 3 Peons on Rs. 18 | 18 |
| 2 Watchmen on Rs. 20 | 20 |

BUILDINGS.

It is presumed that the three officers would find their own quarters in the neighbourhood and that the graduate staff in the Soil-physics and Sugarcane-physiology sections would do likewise.

This leaves the following staff to be provided for in kutchra buildings to be erected at the plot site :—

- 3 Graduate assistants.
- 6 Non-graduate assistants.
- 2 Clerks.
- 2 Laboratory-boys, storekeeper and engine driver.
- 6 Peons and watchmen.

Laboratory and Office.—Accommodation on the site of the plot would be required for the laboratory and office in a temporary building.

Gurhal shed.—A suitable shed to accommodate the sugarcane mill and engine and the furnaces will be required.

Miscellaneous.—Kutchra buildings for cattle, implements stores and coolies will be required.

EQUIPMENT.

The following equipment would be required :—

- I. Livestock and Deadstock.
- II. Land-improvements, including fencing.
- III. Laboratory fittings and apparatus.

ESTIMATES.

The estimated cost of this scheme is given in summary below while the details will be found in Appendix A, from which it

| <i>Non-recurring Expenditure.</i> | | | Rs. | the details will be found in Appendix A, from which it will be seen that the total cost for a five-year period will amount to Rs. 5,22,088 made up of Rs. 67,918 non-recurring and Rs. 4,54,170 recurring. The Department of Agriculture is in a position to contribute Rs. 1,30,850 made up of Rs. 6,105 non-recurring and Rs. 1,24,745 recurring as shown in the margin. |
|---|----------------------------------|--|----------|--|
| Item. | Value in rupees. | | | |
| Livestock | 2,121 | | | |
| Implements | 2,000 | | | |
| Bullock-mill | 250 | | | |
| Weighing machines | 300 | | | |
| Office-furniture | 745 | | | |
| Laboratory fittings | 689 | | | |
| | | | 6,105 | |
| <i>Recurring Expenditure.</i> | | | | |
| Item. | Amount in rupees for five years. | | | |
| Pay of establishment for five years | 52,370 | | | |
| Travelling allowance | 2,375 | | | |
| Contingencies | 70,000 | | | |
| | | | 1,24,745 | |
| Total contribution by the Bombay Department of Agriculture .. | | | 1,30,850 | |

SUMMARY ESTIMATES OF COST.

Non-recurring Expenditure.

| Item. | | Rs. | Rs. |
|---|--------|--------|--------|
| (1) Buildings | | 31,650 | |
| (2) Equipment as under :— | | | |
| | | Rs. | |
| (a) Livestock and deadstock | 21,670 | | |
| (b) Land improvement | 4,598 | | |
| (c) Laboratory fittings and apparatus | 10,000 | | |
| | | 36,268 | 67,918 |

III

Recurring Expenditure.

| Item. | Rs. |
|---|----------|
| (1) Pay of officers | 24,480 |
| (2) Pay of Establishment | 22,464 |
| (3) Allowances and Honoraria | 7,280 |
| (4) Contingencies | 36,610 |
| | <hr/> |
| | 90,834 |
| Therefore for five years (90,834 × 5) | 4,54,170 |
| Therefore total cost for five years | <hr/> |
| | 5,22,088 |

T. F. MAIN,

Director of Agriculture, Bombay Presidency.

Poona, 24th October 1930.

APPENDIX A.

DETAILED ESTIMATES OF COST.

The following statements give the detailed estimates of the scheme.

*Non-recurring Expenditure.**Building.*

| DESCRIPTION. | | | | | | Amount in rupees. |
|---|----------------------|---------------------------------|-----------------------------|---------------------------------|-----------------|----------------------|
| A. Residential (kutchra quality) | | | | | | 11,070 |
| Type of person. | Number of persons. | Square feet allowed per person. | Total square feet required. | Rate per square foot in rupees. | Cost in rupees. | |
| Graduate Assistants .. | 3 | 553 | 1,659 | 1.5 | 2,490 | |
| Non-graduates and clerks. | 8 | 475 | 3,800 | 1.5 | 5,700 | |
| Servants | 12 | 180 | 1,920 | 1.5 | 2,880 | |
| B. Laboratory and Office (temporary quality) | | | | | | 9,918 |
| Internal measurements in feet. | | | Name of building. | | | |
| 50 × 25 | | | Laboratory. | | | |
| 20 × 25 | | | Clerks' office. | | | |
| 12 × 25 × 3 | | | 3 Office rooms. | | | |
| ∴ allowing for partition walls 114 × 29 = 3,306 square feet at Rs. 3 per square foot. | | | | | | |
| C. Gurhal and Engine shed | | | | | | 3,000 |
| D. Miscellaneous (kutchra quality) | | | | | | 7,662 |
| Type of building. | Area in square feet. | | Rate per square foot. | Cost in rupees. | | |
| Cattle shed for 10 pairs .. | 50 × 20 = 1,000 | | 1.75 | 1,750 | | |
| Implement shed | 25 × 15 = 375 | | 1.5 | 562 | | |
| Store | 50 × 20 = 1,000 | | 1.25 | 1,250 | | |
| Coolie lines for 15 men .. | 160 × 15 = 2,400 | | 1.5 | 3,600 | | |
| Manure pit .. .. . | ..... |  | .. | 500 | | |
| Total (buildings) | | | | | | 31,650 |

APPENDIX A—*contd.*

EQUIPMENT.

I—Livestock and Deadstock.

| Serial Number. | Item. | Cost in rupees. |
|-------------------------------|---|-----------------|
| 1 | 10 pairs of cattle at Rs. 350 | 3,500 |
| 2 | Implements | 2,000 |
| 3 | Weigh-bridge and two weighing machines | 2,100 |
| 4 | Rain-gauge | 50 |
| 5 | One power cane-crushing mill and oil engine and accessories | 10,670 |
| 6 | One bullock mill | 250 |
| 7 | Office-furniture | 1,100 |
| 8 | Reference books | 1,000 |
| 9 | Water-measuring devices | 1,000 |
| Total Livestock and Deadstock | | 21,670 |

II.—Land Improvements.

| Serial Number. | Item. | Cost in rupees. |
|----------------|--|-----------------|
| 1 | Fencing 8,348 feet at Rs. 1,900 per mile | 3,098 |
| 2 | Levelling land, etc., at Rs. 15 per acre | 1,500 |

Total Land improvements 4,598

III.—Laboratory fittings and apparatus 10,000

Total (Equipment) 36,268

Total Non-recurring Expenditure 67,918

| Name of head. 1 | Budget estimates. | | | | | Remarks. 7 |
|--|---|----------------|----------------|----------------|----------------|---------------|
| | 1st year. 2 | 2nd year. 3 | 3rd year. 4 | 4th year. 5 | 5th year. 6 | |
| | <i>Staff required in the Agricultural Section proper.</i> | | | | | |
| <i>Pay of officers.</i> | | | | | | |
| One officer in class I Provincial Agricultural service (Rs. 320—40—1,200) starting on Rs. 1,000 per mensem | 12,000 | 12,480 | 12,960 | 13,440 | 13,920 | |
| <i>Pay of establishment.</i> | | | | | | |
| Three graduate assistants as under :— | | | | | | |
| One Senior in Grade I, Subordinate Agricultural Service (Rs. 220—10—300) starting on Rs. 230 per mensem .. | 2,760 | 2,880 | 3,000 | 3,120 | 3,240 | |
| One Junior in Grade III, Subordinate Agricultural Service (Rs. 105—5—140) starting on Rs. 125 per mensem | 1,500 | 1,560 | 1,620 | 1,680 | 1,680 | |
| One Junior in Grade III, Subordinate Agricultural Service (Rs. 105—5—140) starting on Rs. 105 per mensem | 1,260 | 1,320 | 1,380 | 1,440 | 1,500 | |
| Three non-graduate assistants in the grade of Rs. 30—5/2—80 as under :— | | | | | | |
| One starting on Rs. 50 per mensem | 600 | 600 | 660 | 660 | 720 | |
| One starting on Rs. 45 per mensem | 540 | 540 | 600 | 600 | 680 | |
| One starting on Rs. 30 per mensem | 360 | 360 | 420 | 420 | 480 | |
| One store-keeper in the grade of Rs. 30—5/2—80 starting on Rs. 55 per mensem | 660 | 660 | 720 | 720 | 780 | |
| One Engine Driver on Rs. 60 per mensem | 720 | 720 | 720 | 720 | 720 | |
| | 8,400 | 8,640 | 9,120 | 9,360 | 9,780 | |

| Name of head. | Budget estimates. | | | | | Remarks. |
|---|-------------------|-----------|-----------|-----------|-----------|----------|
| | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| <i>Staff required in the Soil-Physics section.</i> | | | | | | |
| <i>Pay of officers.</i> | | | | | | |
| One officer in class I of the Provincial Agricultural Service (Rs. 320—40—1,200) starting on Rs. 400 per mensem | 4,800 | 5,280 | 5,760 | 6,240 | 6,720 | |
| <i>Pay of establishment.</i> | | | | | | |
| Two graduate assistants as under:— | | | | | | |
| One senior in Grade I of Subordinate Agricultural service (Rs. 220—10—300) starting on Rs. 220 per mensem | 2,640 | 2,760 | 2,880 | 3,000 | 3,120 | |
| One junior in Grade II of Subordinate Agricultural Service (Rs. 150—5—200) starting on Rs. 150 per mensem | 1,800 | 1,860 | 1,920 | 1,980 | 2,040 | |
| One non-graduate assistant on Rs. 30—5/2—80 starting on Rs. 40 per mensem | 480 | 480 | 540 | 540 | 600 | |
| Two Laboratory boys on Rs. 18 per mensem each | 432 | 432 | 432 | 432 | 432 | |
| | 5,352 | 5,332 | 5,772 | 5,952 | 6,192 | |
| <i>Staff required for the Crop-physiology section.</i> | | | | | | |
| <i>Pay of officers.</i> | | | | | | |
| One officer in class I of the Provincial Agricultural Service (Rs. 320—40—1,200) starting on Rs. 400 per mensem | 4,800 | 5,280 | 5,760 | 6,240 | 6,720 | |

| Name of head. 1 | Budget estimates. | | | | | Remarks. 7 |
|--|-------------------|----------------|----------------|----------------|----------------|----------------|
| | 1st year. 2 | 2nd year. 3 | 3rd year. 4 | 4th year. 5 | 5th year. 6 | |
| <i>Pay of establishment.</i> | | | | | | |
| One graduate assistant of Grade I in Subordinate Agricultural Service (Rs. 220-10-300) starting on Rs. 220 per mensem .. | 2,640 | 2,760 | 2,880 | 3,000 | 3,120 | |
| Two non-graduate assistants on Rs. 30-5/2-80 starting on Rs. 40 per mensem each .. | 960 | 960 | 1,080 | 1,080 | 1,200 | |
| Two Laboratory boys on Rs. 18 per mensem each .. | 432 | 432 | 432 | 432 | 432 | |
| | 4,032 | 4,152 | 4,392 | 4,512 | 4,752 | |
| <i>Staff required in office section.</i> | | | | | | |
| <i>Pay of establishment.</i> | | | | | | |
| One head clerk Accountant on Rs. 105-5-140 starting on Rs. 105 per mensem .. | 1,260 | 1,320 | 1,380 | 1,440 | 1,500 | |
| One junior clerk on Rs. 30-5/2-80 starting on Rs. 40 per mensem .. | 480 | 480 | 540 | 540 | 600 | |
| One naik on Rs. 20 per mensem .. | 240 | 240 | 240 | 240 | 240 | |
| Three peons on Rs. 18 per mensem each .. | 648 | 648 | 648 | 648 | 648 | |
| Two watchmen on Rs. 20 per mensem each .. | 480 | 480 | 480 | 480 | 480 | |
| | 3,108 | 3,168 | 3,288 | 3,348 | 3,468 | |
| Grand Total .. | 42,492 | 44,532 | 47,052 | 49,092 | 51,552 | |
| Total pay of officers .. | 21,600 | 23,040 | 24,480 | 25,920 | 27,360 | Total 1,22,400 |
| Total Pay of Establishment .. | 20,892 | 21,492 | 22,572 | 23,172 | 24,192 | „ 1,12,320 |

| Name of head. 1 | Budget estimates. | | | | | Remarks. 7 |
|---|-------------------|----------------|----------------|----------------|----------------|---------------|
| | 1st year. 2 | 2nd year. 3 | 3rd year. 4 | 4th year. 5 | 5th year. 6 | |
| <i>Allowances and Honoraria.</i> | | | | | | |
| Travelling allowance as under :— | | | | | | |
| Rs. | | | | | | |
| 2,000 Agricultural Section. | | | | | | |
| 1,000 Soil Physics Section. | | | | | | |
| 500 Crop Physiology Section. | | | | | | |
| 3,500 Total .. | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 | |
| Conveyance allowance as under :— | | | | | | |
| Three officers in Class I, Provincial Agricultural Service at Rs. 75 per mensem each (Rs. 2,700). | | | | | | |
| Three graduate assistants in the Soil Physics and Crop-Physiology sections at Rs. 30 per mensem each (Rs. 1,080). | | | | | | |
| | 3,780 | 3,780 | 3,780 | 3,780 | 3,780 | |
| | 7,280 | 7,280 | 7,280 | 7,280 | 7,280 | 36,400 |

Contingencies.

| Serial Number. | Item. | Amount in Rupees. |
|----------------|--|-------------------|
| 1 | Cultivation and management of plot | 23,000 |
| 2 | Rent of land 100 acres at Rs. 35 per acre | 3,500 |
| 3 | Office and miscellaneous incidental expenditure | 1,000 |
| 4 | Service stamps | 300 |
| 5 | Soil-Physics section | 5,000 |
| 6 | Sugarcane physiological section | 3,000 |
| 7 | Current repairs to buildings 3 per cent. on Rs. 27,000 | 810 |
| | Total contingencies | 36,610 |

APPENDIX XII.

APPOINTMENT OF VETERINARY RESEARCH OFFICERS IN THE PROVINCES :—

- (a) SCHEME FOR RESEARCH INTO THE PROTECTION OF BUFFALOES AND CATTLE FROM HAEMORRHAGIC SEPTICAEMIA BY THE BACTERIOPHAGE METHOD IN BENGAL. (ENCLOSURE I.)
- (b) APPLICATION FOR A RECURRING LUMP SUM GRANT FOR THREE YEARS TO COVER THE PAY OF A RESEARCH OFFICER AND EQUIPMENT TO INVESTIGATE THE CAUSES OF CONTAGIOUS DISEASES IN ANIMALS IN THE CENTRAL PROVINCES. (ENCLOSURE II.)

The Governments of Bengal and the Central Provinces have submitted Schemes of research (Enclosures I and II) on the subjects noted above with application for grants of Rs. 1,07,400 and Rs. 49,200, respectively, the expenditure in each case being spread over a period of three years. In this connection the Animal Husbandry Expert Adviser to the Council has sketched out a scheme (Enclosure III) for the appointment of veterinary investigation officers in each province which will, if found feasible, replace isolated schemes of veterinary research such as those put forward by Bengal and the Central Provinces and thus give an impetus in all provinces to veterinary research on co-ordinated lines. The schemes from the two provinces as well as the general scheme are now for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

The 10th December 1930.

ENCLOSURE I.

Copy of letter No. 5131, dated the 13th November 1930, from the Secretary to the Government of Bengal, Agriculture and Industries Department, Calcutta, to the Secretary, Imperial Council of Agricultural Research.

1.

2. I am to request that the following scheme* which was approved at the first meeting of the Bengal Agricultural Research Committee and forwarded with this Department letter No. 268-T. A. I., dated the 3rd June 1930 and which is still outstanding may be carried forward for consideration at the January meeting of the Advisory Board.

LETTER FROM P. J. KERR, ESQ., I.V.S., VETERINARY ADVISER TO THE GOVERNMENT OF BENGAL, TO THE SECRETARY TO THE GOVERNMENT OF BENGAL, DEPARTMENT OF AGRICULTURE AND INDUSTRIES, NO. 797/A-85-V.D.A., DATED CALCUTTA, THE 12TH MARCH 1930.

I have the honour to submit an application for an allotment of funds from the Imperial Council of Agricultural Research for the purpose of engaging a Specialist Officer to undertake research into the "Protection of Buffaloes and Cattle from Haemorrhagic Septicæmia by the Bacteriophage method."

2. This disease is prevalent throughout India and causes heavy losses annually in the water districts of Bengal. The figures for the last three years are as follows :

| | | | | Outbreaks reported. | Deaths reported. |
|---------|----|----|----|------------------------|---------------------|
| 1926-27 | .. | .. | .. | 59 | 1,507 |
| 1927-28 | .. | .. | .. | 85 | 1,926 |
| 1928-29 | .. | .. | .. | 156 | 3,202 |

3. These figures do not represent the total losses as in many cases seats of outbreaks cannot be visited, and so outbreaks are not verified. And there must be a number of smaller outbreaks and deaths not reported at all for various reasons.

4. The present methods of combating this disease are (a) Serum Alone method and (b) Vaccine method.

(a) The Serum Alone method confers immunity of very short duration and for it to be successful every animal within the affected area must be inoculated in the course of a few days. This is not possible with the limited staff available, even if the owners were all willing. There can be no compulsion, and persuasion means more time and more staff. The necessity for re-inoculation after a week if the outbreak persists is a great handicap. It is, however, the only method at present applicable in the face of widespread outbreaks.

(b) Vaccine treatment.—This method does not confer immunity immediately, several days elapse before the protection is acquired. It is therefore not suitable for combating outbreaks but can be used as a prophylactic method. Here again its utility is limited as the protection given only lasts for about two months, whereas the Haemorrhagic Septicæmia season lasts 4-5 months. The methods referred to above can be combined but that means double work, requires more staff and the immunity conferred lasts only for two months. Serum costs 6 annas a dose.

5. Bacteriophage.—The chief benefit of this method, to the best of my knowledge, is the cheapness of its production and the ease with which it can be applied. It is essentially a treatment to be used at the time of outbreaks, but

*Scheme for engaging a specialist officer for research into Protection of Buffaloes and Cattle from Haemorrhagic Septicæmia by the Bacteriophage method.

it is not yet known for what period the immunity conferred lasts. It is also a curative measure for affected animals.

Should this method prove satisfactory Government would be saved considerable expenditure and the results to cattle owners would be infinitely more beneficial.

6. While this Specialist Officer is engaged in Bengal, I propose that a suitable officer should be posted under him for training in research, who would be qualified on completion of the Specialist's term to carry on the work on the lines adopted, and also take up fresh subjects for research. This help given by the Research Council will thus be twofold. It will help to investigate an urgent problem affecting the whole of India, and at the same time enable Bengal to help itself in such matters in future.

7. We have an officer in the Provincial Service, who is suitable for training under the Specialist, and has had the preliminary education necessary. At the Bengal Veterinary College there is a suitable laboratory to serve as the headquarters of the Specialist.

8. The approximate cost of the scheme will be as follows :—

| | First year. Rs. | Second year. Rs. | Third year. Rs. |
|--|-----------------------|------------------------|-----------------------|
| Pay of Specialist Officer (Rs. 1,000—50—1,100) .. | 12,000 | 12,600 | 13,200 |
| His travelling allowance at Rs. 500 per month .. | 6,000 | 6,000 | 6,000 |
| Pay of his peon at Rs. 15 per mensem .. | 180 | 180 | 180 |
| House allowance as per Calcutta House Allowance Scheme .. | 3,000 | 3,000 | 3,000 |
| Pay of his Assistant under training (Rs. 350—20—390) .. | 4,200 | 4,440 | 4,680 |
| Pay of peon of the Assistant under training at Rs. 15 per month .. | 180 | 180 | 180 |
| Travelling allowance of two peons at Rs. 25 each per month .. | 600 | 600 | 600 |
| Purchase and keep of animals .. | 2,000 | 2,000 | 2,000 |
| Contingencies .. | 1,000 | 1,000 | 1,000 |
| Passage for Specialist Officer .. | 1,000 | 1,000 | 1,000 |
| Total .. | 30,160 | 31,000 | 31,840 |
| (Overseas pay of the Specialist Officer at £30 per month) .. | £360 | £360 | £360 |

ENCLOSURE II.

COPY OF LETTER FROM THE REVENUE SECRETARY TO GOVERNMENT, CENTRAL PROVINCES, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, NEW DELHI, No. 1371-543-XIV, DATED THE 3RD NOVEMBER 1930.

SUBJECT :—*Application for a recurring lump grant for three years to cover the pay of Research Officer and equipment.*

I am directed by the Government of the Central Provinces (Ministry of Agriculture) to address the Imperial Council of Agricultural Research for financial assistance in connection with a scheme for the investigation of numerous parasitic infections which are prevalent throughout the province.

2. There has been a marked increase in the mortality of cattle in this province from contagious diseases for the last few years. Investigations carried out by the Veterinary Department in various villages showed that 85 per cent. of the animals in those villages were affected with piroplasms of some kind but the true extent of the infection in the province as a whole and the economic loss entailed by such infection have not so far been investigated. The two diseases reported periodically from the districts are Tiwa and Bhowri. The former appears to incapacitate working bullocks for some time while the latter is known to be sometimes fatal. In addition to the above there are numerous parasitic infections prevalent in the province which received very little attention so far for want of an officer who could undertake the work.

3. A large number of specimens are received annually in civil Veterinary Department Laboratory, Nagpur, for examination and report, but the sanctioned staff of one officer of the Central Provinces Veterinary Service, class II, and one Veterinary Assistant Surgeon which is fully occupied with the routine work is unable to render any assistance to the field staff in combating these obscure epidemics which require a whole-time officer for their investigation.

4. I am to add that Central Provinces is a suitable area for the research of epidemic diseases and the results achieved when published would be of all India importance and benefit the workers and stock owners throughout the country. I am accordingly to request that Imperial Research Council will be so good as to assist this Government by a recurring lump grant of Rs. 16,400 for three years commencing from the year 1931-32 to cover the pay of Research Officer and equipment as shown below :—

| | Rs. |
|--|--------|
| (1) Salary of officer on three years contract at Rs. 1,000 per mensem. | 12,000 |
| (2) Two peons | 400 |
| (3) Chemicals, microscopes, etc. | 4,000 |
| Total | 16,400 |

ENCLOSURE III.

Note by the Animal Husbandry Expert Adviser to the Imperial Council of Agricultural Research.

After careful consideration of the whole matter I have come to the conclusion that what is required is a research organisation covering the whole of India, based on Muktesar, where the work is now being divided into definite sections, suitable for working in collaboration with a veterinary investigation staff in each province. If appointed this staff would be constantly engaged in studying local conditions in the field and would supply the necessary information and material for systematic record and research at Muktesar.

India is such a vast country and the conditions are so variable that without such an organisation I feel that it will be difficult to obtain the maximum of practical benefit from the research work done at Muktesar. The present backward position of India, in the matter of serum-simultaneous inoculation against Rinderpest, is a very good instance of the paralysing effect of the totally inadequate provision which has been made India in the past for disease investigation, which is essential to efficiency.

There is no necessity for large institutes in provinces for this work and from what I have seen I think each province would be able to provide sufficient accommodation without any considerable expenditure on buildings. In view of the present financial stringency, however, there is no prospect of disease investigation officers being employed by provincial Governments in the near future, and I recommend that a small veterinary investigation staff for each province be paid for by this Council for 5 years, in provinces where no such staff now exists.

By the collaboration of this staff with Muktesar we should be able, during that time, to obtain a fairly complete survey of disease conditions throughout India, which at present does not exist, as well as being in a far better position than now to apply the latest methods of disease control.

At the end of 5 years, it may be anticipated that provinces will have realised the necessity for the permanent provision of such staff and facilities, but if provincial funds are still not available, I can think of no better way for the Imperial Council of Agricultural Research to assist the live-stock industry of this country.

With such an organisation in being and scientifically controlled, Directors of Veterinary Services and stock-owners would have some one to turn to for immediate help in dealing with their disease problems and we should at the same time, be training suitable young officers in practical disease investigation in the field, which must always be the first step in control in any country.

I consider that one veterinary investigation officer, with adequate assistance, should be provided at once for each of the following provinces and presidencies, where at present no such staff exists, *viz.* Bengal, Assam, Bombay, Central Provinces, United Provinces, and one for Sind, where special problems require to be studied, owing to the extension of irrigation to large additional areas.

The Punjab and Burma already have Research Officers and need not be considered at the moment, though in view of the large area covered and the necessity of providing for N. W. F. P., I think an Assistant Veterinary Investigation Officer would be justified for the former.

In the case of Madras, where disease investigation has been more thoroughly dealt with in the past than elsewhere, the proposal now put up for a Toxicologist* should be supported, so that poisoning by plants may be dealt with at the same time as microbial diseases, for the benefit of India as a whole.

The staff required for each province would, I think, be one Veterinary Investigation Officer, one Laboratory Assistant, one Stenographer, one Laboratory

*NOTE.—Proposal not officially received.

Servant and two peons which, if the provinces provide the necessary accommodation and equipment, should cost the Imperial Council of Agricultural Research approximately Rs. 10,000 per province per annum.

On this basis the total cost to the Imperial Council of Agricultural Research of the whole proposal would be Rs. 80,000, which in my view, would be thoroughly justifiable expenditure by that Council.

This disease investigation personnel, when appointed, should be borne on the staff of the Director of Veterinary Services of the province concerned, and should work under his supervision, in collaboration with Muktesar, making full use of provincial farms for the investigation of special local problems and for testing new methods in the field, and I feel sure that the expenditure involved would be amply repaid in the results obtained.

Provinces, some officially, others informally, have requested us to grant assistance for the investigation of their particular disease problems, as follows :—

Bengal and Assam.—Hæmorrhagic Septicæmia.

Madras.—Poisonous plants.

C. P.—Helminthology and Pirolasmosis.

U. P.—Helminthology and Coccidiosis.

Bombay.—Blackquarter and Anthrax.

In addition Rinderpest and Foot-and-Mouth disease, Blackquarter, Anthrax, Surra, Rabies, Mange and numerous unclassified diseases of sheep, goats and fowls require further investigation everywhere and I feel that the only method by which tangible results will be obtained, within a reasonable time, is to organise the work as suggested above.

A. OLVER, Col.

APPENDIX XIII.

Investigations on (1) virus diseases of plants and (2) physiologic forms of wheat rust in Bombay.

Attention is invited to the letter (Enclosure I) from the Government of Bombay, No. 4675-A/28, dated the 21st May 1930, on the subject of investigations on virus diseases of plants and physiologic forms of wheat rust. The schemes, which are fully explained in the application forwarded by the Government of Bombay, involve expenditure of Rs. 4,350 non-recurring and Rs. 99,360 recurring over a period of 5 years. A note (Enclosure II) on the second (rust research) scheme by Dr. K. C. Mehta, Professor of Botany, Agra College, who is at present engaged with the financial aid of the Council on an investigation of cereal rusts, is also enclosed.

M. S. A. HYDARI,

Secretary,

ENCLOSURE I.

LETTER FROM THE ACTING CHIEF SECRETARY TO THE GOVERNMENT OF BOMBAY, REVENUE DEPARTMENT, TO THE SECRETARY TO THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, No. 4675-A/28, DATED THE 21ST MAY 1930.

SUBJECT:—*Investigations on virus diseases of plants and physiologic forms of wheat rust.*

I am directed by the Government of Bombay (Transferred Departments) to forward an application from the Director of Agriculture for a grant-in-aid of Rs. 1,03,710 for investigations on virus diseases of plant and physiologic forms of Black rust fungus of wheat on the lines of the schemes drawn up by the Plant Pathologist. I am to add that the Government of Bombay support the application and trust that it will receive favourable consideration at the hands of the Imperial Council of Agricultural Research.

LETTER FROM THE DIRECTOR OF AGRICULTURE, BOMBAY PRESIDENCY, POONA, TO THE CHIEF SECRETARY TO GOVERNMENT, REVENUE DEPARTMENT, BOMBAY, No. 493 OF 1930, DATED THE 5TH APRIL 1930.

SUBJECT:—*Application to the Imperial Council of Agricultural Research for grant-in-aid for schemes on Virus Diseases.*

I have the honour to forward herewith copy of letter No. F. 74/370 of March 29th, 1930 from the Plant Pathologist to the Government of Bombay (Dr. B. N. Uppal) and a scheme drawn up by him for co-operative investigation on virus diseases of plants and another on physiologic forms of black rust fungus of wheat. I have the honour to request that these schemes may be put before the Imperial Council of Agricultural Research at their next meeting and I trust that the amount required will be sanctioned. There is little need to plead the necessity for investigation of virus diseases. These diseases are receiving a large amount of attention throughout the whole world and one of the South American States recently offered a very valuable money prize for work on virus diseases of sugarcane. Work in India on these diseases has so far been conspicuous by its absence with the exception of certain work on sugarcane. But the presence of virus diseases in a great number of crops is obvious even to the casual observer. The chilli crop on which some of the work is to be done is an extraordinarily important and valuable crop throughout the Presidency. Cardamom is similarly a very valuable crop and 'bhendi' offers opportunities for study which will undoubtedly give important scientific results.

With regard to the research on the physiologic forms of black rust fungus of wheat, I would like to insist on the fact that although a very substantial subvention has been given by the Imperial Council of Agricultural Research to Dr. Mehta for work on wheat rust his investigation is of a totally different character dealing with the way in which the rust fungus is carried over from year to year, while the research now proposed deals with another problem and one of vital importance not only to plant pathologists but also to plant breeders and to farmers. I think, therefore, that the fact that one worker has already been subsidized for work on wheat rust should not prevent other workers being subsidized for the study of totally different aspects of the problem. I would also like prominently to bring to your notice the co-operative nature of this research. This co-operation is in accordance with the best principles of modern science and brings to bear on these two problems the concentrated efforts of three highly equipped men. Dr. B. N. Uppal is B. Sc. of the Punjab University and D. Sc. of Iowa. Dr. V. N. Likhite is B. A. B. S., (Bom.) and D. Sc. of Strasbourg and has experience in work in Holland and America. Mr. J. F. Dastur is M. Sc. (Bom.) and D. I. C. (Lond.). These three scientific workers with their differing out-

look and equipment but with a single aim should therefore be able to do effective works towards the rapid clearing up of the problems which they now propose for assistance from the Imperial Council of Agricultural Research. The researches will be under the administrative control of Dr. B. N. Uppal, i.e., will be under the Bombay Government (the other two workers being collaborators) and the headquarters will be Poona, the laboratory being in the Poona College of Agriculture.

I would ask you to forward these schemes as early as possible with your strong recommendation for the necessary gift of money. The Imperial Council of Agricultural Research is to meet in Simla in the end of May and it is desirable that these schemes should be forwarded to the Secretary, Imperial Council of Agricultural Research, without delay. I am sending one advance copy of both the schemes and also a copy of this letter to the Secretary, Imperial Council of Agricultural Research, for information.

Copy of letter No. F.74-370, dated 29th March 1930, from the Plant Pathologist to Government, Bombay, Poona, to the Director of Agriculture, Bombay Presidency, Poona.

SUBJECT :—*Research schemes on (1) virus diseases and (2) the physiologic forms of wheat rust.*

With reference to your letter No. 493, dated 5th December 1929, I have the honour to enclose herewith two schemes, and to request that you will be good enough to approach the Imperial Council of Agricultural Research for a grant-in-aid for carrying out research on these schemes. I also beg to state that the co-operation of Dr. V. N. Likhite, Director of Agriculture, Baroda, and Mr. J. F. Dastur, Mycologist to Government, C. P., Nagpur, has been arranged in connection with the schemes on virus diseases and the physiologic forms of wheat rust respectively, and that both these officers have obtained the permission of their respective Governments to collaborate with me in these investigations. It may, however, be noted that these officers will not, in any way, be responsible for the administrative control of the schemes; but they will fully collaborate with me in directing the research and by providing the necessary facilities in their provinces to the men engaged in the work.

2. I have enclosed detailed statements of the recurring and non-recurring expenditure for which it is requested that provision may be made for a period of five years in the first instance. It will also be noted that it is proposed to appoint a Special Mycologist, who will be in charge of both the problems. He will be assisted in his work by two Graduate Assistants, one in charge of each scheme. Since both the problems are of a highly technical nature, it will be necessary to appoint a well-trained person. The proposal that the Special Mycologist should be in charge of both the problems has certain advantages; it would enable us to effect a saving in the pay of the chief investigators (one for each scheme) who would ordinarily be required, as well as have a man of ripe experience in charge of the schemes. The headquarters of the Special Mycologist and his staff will be at Poona, where he will have adequate laboratory facilities at the Poona College of Agriculture. As regards investigation into the virus disease of cardamom, it will probably be necessary to do a major portion of this work at Sirsi, and I feel that it will be possible to make provision for a small laboratory there within the contingent grant of Rs. 3,000 per annum provided for in connection with the scheme on virus diseases.

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VIRUS DISEASES OF PLANTS.

(Co-operative Investigation between Dr. B. N. Uppal, Department of Agriculture, Bombay, and Dr. V. N. Likhite, Department of Agriculture, Baroda.)

Among the plant diseases, the virus diseases constitute one of the most important groups, and some of them have been known to be the most destructive. In recent years, this group of plant diseases has assumed considerable importance and as a result of extensive studies, our knowledge about these diseases has considerably been advanced; but their casual nature still continues to be obscure. In addition to the work on the casual agent, a great deal has been accomplished with regard to the dissemination of the virus diseases by such agencies as insects, seed, perennial parts of host plants and by perennial weeds. This subject offers a useful field of study, as by this means only, it is possible at this stage of our knowledge of these diseases to work out methods of control.

Excepting the work on sugarcane mosaic, no investigation of any importance has been made on the virus diseases in India. In fact, no survey of the virus diseases of the hosts of agricultural importance has ever been attempted in this country, and we are therefore quite in the dark as to the importance of these diseases in relation to our major crops. However, from the information available regarding some of these diseases it seems that they are causing great damage every year, and in certain cases have become limiting factors in the cultivation of these crops. It will therefore be seen that the work on the virus diseases of plants which we propose to undertake if a suitable grant-in-aid is sanctioned, is of great practical and scientific importance, as this field has been a neglected one in India, and it is high time that some beginning may be made to relieve the distress which, in some cases has become very acute.

We propose to divide our work into two parts (1) a general survey of the virus diseases in the Bombay Presidency (we shall be willing to extend this work to the other provinces of India; but it will be done in collaboration with the Plant Pathologists of these provinces), and (2) investigations into specific virus diseases.

1. General Survey of virus diseases —

As has been pointed out above, very little is known regarding the virus diseases of important crops, and it is desirable that an extensive survey of these diseases be carried out. This should, however, be considered as a subsidiary part of the scheme which relates mainly to investigation into specific virus diseases of plants.

2. Specific virus diseases to be investigated.—

In the first instance we propose to undertake investigation into the virus diseases of three crops, namely chillies (*Capsicum annum*), cardamom (*Elettaria cardamomum*) and Bhendi (*Hibiscus esculentus*). Before going into the importance of these diseases, it may be pointed out that we propose to investigate all the aspects of the virus diseases including pathological histology physiologic studies of the virus, insect or seed transmission wild plants as hosts harbouring the virus, transmissibility of the virus to other hosts, etc., and control measures.

(a) *Virus disease of chillies.*—Chillies, *Capsicum annum*, are grown extensively in the Bombay Presidency, covering an area of more than 150,000 acres. Generally chillies are grown as a dry crop in the Bombay Presidency, i.e., no irrigation is given and the crop is fed by the monsoon. The crop suffers from several diseases which are responsible for a great deal of damage, amounting, in some cases, to a total failure. In order to find out as to which of these diseases was the most serious to justify a detailed intensive study of it, an intensive survey of the most important chilli tracts in the Bombay Presidency was carried out in 1928. As a result of this survey it was found that the most serious disease of this crop was an obscure disease, which shows itself in reduced size

and curling of terminal leaves, the reduction of leaves being very pronounced in severe infection. In the early stages, the leaves also show mottling of the foliage; but this characteristic becomes less evident with the curling of the leaves. When infection is early, *i.e.*, when the plants are affected in a seed-bed before they are transplanted, a very large number of flowers drop down, and a few form very small berries. If, however, there is late infection, blossoms develop into more or less normal fruits.

It was first thought that this affection was caused by mites, and the Bombay Department of Agriculture recommended dusting with lime sulphur. This treatment was found effective when mites were involved; but it was found that dusting with lime sulphur did not invariably result in freeing the plants from infection. However, during the course of the survey in 1928, it was observed that in a very large number of fields examined all over the Presidency from Katak to Gujarat infestation with thrips was much more common than with mites. Further it was noticed that when thrips were present in very small numbers (this happens during the monsoon as the rain washes down the thrips, and acts as their natural enemy. However, these insects appear in large numbers in the latter part of the monsoon, *i.e.*, about the end of September or the beginning of October. On the other hand, mites cause severe damage during the cool, rainy weather, and become less active at about the end of the monsoon season), the damage was very slight and the symptoms characteristic of the virus diseases (as described above), were present. This led us to suspect that we were perhaps dealing with a virus disease, and that the thrips were vectors of the virus. Healthy chilli plants were raised in insect-proof muslin cages, and the virus-liferous insects collected from the affected plants in the field were introduced into a cage containing healthy plants (showing no mottling or reduced size of leaves). A control cage was provided with an equal number of healthy plants; but in this case no thrips were introduced on the plants. In almost all cases, the plants exposed to infection (by thrips) became diseased, whereas the plants in the control cage were normal even after 2½ months.

Following the experiment with thrips, attempts were made to effect transmission by means of the juice from diseased plants. Young leaves from diseased plants were removed and ground in a sterile mortar together with sterile distilled water. Five leaves of each of six healthy plants were then inoculated as follows: A leaf was supported by a wooden slip, and a drop of inoculum was dropped on it, which was then scratched or pricked through the drop with the point of a fine needle in a number of places, usually about 20 per leaf. About 50 per cent. of the plants thus treated showed mottling, whereas the control plants, *i.e.*, plants which had received a similar treatment except that in place of the inoculum sterile water was used, all remained healthy. This experiment was repeated many times with similar results, thus showing that we were dealing with a virus disease.

Last year field trials were made to control thrips by means of Paris green (plus gul) and nicotine sulphate. The results are inconclusive, as the disease did not appear and there was normal yield although thrips were present on the plants in as large number as in the previous years.

It will be seen from the above statement that the most destructive disease of chillies is a virus trouble; but the progress of work done in the last two and a half years has been far from satisfactory on account of the very meagre facilities available for this investigation. The total grant made available for this purpose by the Bombay Department of Agriculture amounted to Rs. 1,000 including Rs. 600 as the wages for one year of the person engaged to help in carrying out the work. Apart from the amount of work turned out, it is not proper to expect that a fresh man employed on Rs. 600 per year will be able to contribute something of a high order. In the case of the virus diseases where training counts far more than anywhere else, the chief requisite is to engage a man who has received fairly good training in plant pathology. It is not the routine work which he will be required to do, but he should be able to conceive the problem.

This disease has recently been reported from Burma and I think that it may also be found in the Madras Presidency where chillies are grown on a large scale. It may be present in Bihar and Orissa. In 'Fungi and Diseases in Plants' by E. J. Butler, a casual reference has been made to this disease (described as an obscure disease) as being the most serious disease affecting the chillie crop. Considering the All-India importance of this crop and its universal use by the people of this country, any disease which may affect the production of this crop, should engage our earnest attention; and we have evidence to believe that the virus disease of chillies falls in this category.

(b) *Virus disease of Hibiscus esculentus*.—Bhendi, *Hibiscus esculentus*, is a crop which is grown all over India, and is affected by a disease which is probably a virus disease. This disease has never been studied and we propose to investigate it thoroughly, as this disease has an all-India importance.

(c) *An obscure disease of cardamom resembling yellows (a virus disease)*.—The cultivation of the cardamom *Elettaria cardamomum* is confined to the Western and Southern India. In the Bombay Presidency, it grows in the beautiful hill gardens of North Kanara. The crop is grown as a subsidiary crop in the spice gardens. It is usually free from diseases except that it becomes unhealthy due to an unknown cause. The diseased state of the plant is locally known as 'Katte'. The symptoms as described by Sahasrabudhe in the Bombay Department of Agriculture Bulletin No. 157 of 1929, are as follows: "the plants affected with *katte* show a general lack of vigour. The stems are shorter and thinner than those of healthy plants, and the whole clump looks less packed together. The leaves though yellow as already described have no yellow spots. The flowering shoots are few in number and are generally very short. The new rhizomes produced are small and unhealthy. These appearances are usually hardly visible in the first two years of the growth of a plant in a garden, but in an affected place they become very marked in the third and fourth year. In the fifth year it usually does not pay to keep the affected plants longer and they are uprooted and thrown away while the rhizomes from unaffected plants are dug up, cut and planted in new places."

A brief account of the symptoms given above, though incomplete shows that the disease resembles the infectious chlorosis of asters known as 'yellows'. The stunting of the plant, the shortening of internodes, the dwarfing and reduction in the number of flowering shoots and the yellowing of leaves, are all characteristics of yellows. Sahasrabudhe thinks that the diseased condition in plants is brought about by the alkaline nature of the soil, which results from the alkaline material excreted by the protozoa which inhabit the affected soils. We are not convinced that such is really the case, and propose that the whole question should be re-investigated, as the disease is seriously affecting the economic position of cardamom cultivation in Kanara. As a result of this disease, the yield of cardamom has been reduced from 75 to 28 pounds per acre, and many of the plants which used to live for an indefinite period, die within two or three years after they begin to yield. The problem has an all-India importance as cardamoms are grown in restricted localities, and the failure of the crop in these localities will affect the price of this article which is used extensively by the people of this country. The importance of this investigation is therefore obvious.

PHYSIOLOGIC FORMS OF BLACK RUST FUNGUS OF WHEAT.

(Co-operative investigation between Dr. B. N. Uppal, Department of Agriculture, Bombay, and J. F. Dustur, Esquire, Department of Agriculture, Central Provinces.)

The discovery of the phenomenon of physiologic specialisation in the fungi is undoubtedly one of the most important developments in plant pathology. Perhaps the most classical example of this phenomenon is furnished by the fungus, *Puccinia graminis*. It has been shown that this fungus consists of composite group-forms or varieties such as *P. graminis tritici* on wheat, *P. graminis avenae* on oats and some grasses and *P. graminis secalis* on rye, barley and some other grasses but not on wheat or oats. It has also been shown by Stakman and others in the United States, that the wheat variety is composed of component strains, or physiologic forms. They have isolated and studied forty or more forms of *P. graminis tritici*. Some of the physiologic forms on wheat show slight morphological differences; but they are chiefly distinguished by their power of infecting different varieties of wheat, that is a variety of wheat may be immune from one or several physiologic forms of the rust fungus and susceptible to several others. There are varieties of wheat such as *Little Club* which is completely susceptible, and *khapli* which is extremely resistant to all the known physiologic forms in North America. However, in 1929 there was present in the breeding plots at Kirkee, Poona, a physiologic form to which *khapli* was highly susceptible. Further, it has been shown that several of the physiologic forms differ in their geographical distribution. Several factors affect the prevalence and distribution of these forms, and it is likely that the difference in the climatic conditions in the various parts of a country plays no small part in the distribution of these forms.

It will be seen from the foregoing statement that in any work on the breeding of varieties of wheat resistant to black rust, it is of primary importance to know the prevalence of the physiologic forms in the area in which the new types of wheat are to be grown. It is therefore necessary that a thorough survey of the physiologic forms of the wheat rust should be made in the principal wheat-growing areas of this country. Stakman and others have also shown the value of these surveys in the study of the epidemiology of black (stem) rust. That is to say they have suggested the possibility that the physiologic form survey may be used not only to explain certain facts in connection with the development of epidemics but also to predict the probable occurrence of epidemics. To explain more clearly, let us suppose that the only sources of infection in India are the barberries in the Himalayas, which produce aeciospores. Observations made in the United States have shown that the aeciospores are not carried any great distance from the infected barberry bush and that they are not able to withstand such adverse conditions as urediniospores, so that infection of nearby grains and grasses must take place soon after they are discharged from the aecia. Therefore, the infection of grains and grasses by aeciospores is for the most part local or limited in area. From the primary infection on wheat, the stem rust spreads outwards by the succeeding generations of urediniospores, which can be carried by wind long distances. Thus the urediniospores reach the wheat crops in the plains in the United Provinces and the Punjab (a matter of about 25 miles), and by secondary spread by urediniospores, the spread of stem rust may be traced for miles. Now, if it were possible to determine the physiologic forms in the North (i.e., in the plains at the foot of the Himalayas), it would be of value in predicting the probability of rust epidemics in the United Provinces the Central Provinces, the Kathiawar States, Gujarat and North Deccan. That is to say, if the forms of rust in the North in any given year are predominantly those which cannot attack the wheats in the Central Provinces, Gujarat, etc., there would be little to fear even if the weather conditions were favourable for the development of epidemic in these areas. However, if the forms of rust in the North were such as could attack wheat normally in the Central Provinces, Gujarat, etc., there would be likelihood of an epidemic if the weather conditions were favourable.

It has been pointed out above that for breeding rust resistant varieties of wheat for a given area, it will be necessary to know the physiologic forms prevalent in that area. In India, the work on the breeding of rust resistant wheats has been done without any reference to the forms, and indications are that some of the work done in the Bombay Presidency will prove a failure. For instance, resistant wheats developed at the Kirkee Wheat Breeding Station have been found susceptible to rust when grown at Dharwar. Why is it that even under normal conditions Pusa 4 becomes severely rusted in certain areas and not in others, and then again in certain years in the same area where it is normally resistant? I am afraid it may not be possible to explain all the facts on the basis of weather conditions as the only factor in determining the resistance or susceptibility of a variety of wheat under different conditions. This problem is one of the most important in the field of plant pathology, and unless a breeder is in possession of the necessary information about the relative prevalence and distribution of the physiologic forms in the different areas of this country, his work will be imperfect and may result in his labour of many years being wasted.

In order to determine the physiologic forms in different areas, the procedure to be followed will be somewhat as follows. A series of rust nurseries each consisting of a uniform set of wheat varieties, would be established at suitable points in the Bombay Presy., the Kathiawar States and the Central Provinces (the United Provinces and the Punjab will be included as the work progresses). A number of selected varieties of wheat would be grown at these nurseries every year, each variety to be grown in two or three row rows. They would be allowed to become infected in the natural way. Specimens of fresh uredinial material would then be collected at each of these nurseries, and would be sent to Poona, where they would be used promptly to inoculate as many of the differential wheats as possible, grown in the greenhouse there [details of the greenhouse are furnished below (Enclosure 1)]: The reactions of the differential hosts would be tested and the identity of the physiologic forms would be determined by means of a key to be worked out like the dichotomous key used by Stakman and Levine in their studies.

It has been pointed out above that the discovery of physiologic specialisation in *Puccinia graminis tritici* has made the work of the Plant breeder more complex since now he must take into consideration a large number of physiologic forms with their differential reactions. As these forms vary in number, prevalence and severity from year to year in the same area, it is therefore reasonable to assume that certain factors influence the prevalence of the forms and thereby the development of rust epidemics in the area. Seasonal weather conditions appear to be an important factor; but an attempt to analyse the relation of this factor of the development of stem rust must take into consideration the effect of weather on all the phases of the life cycle of the rust, since the effect of weather on one phase of the life cycle may profoundly influence the development of another stage. We therefore also propose to study the relation of seasonal weather conditions to the development of rust epidemics in the wheat-growing areas.

It is requested that these schemes may be sanctioned for a period of five years in the first instance, and the grant-in-aid required for five years for both the schemes will come to Rs. 1,03,710, the details of which are furnished below :—

| <i>Non-recurring Expenditure.</i> | | Rs. |
|--|-------|-------|
| 1. Greenhouse | ... | 2,000 |
| 2. One research microscope | .. | 750 |
| 3. Frigidaire model M-12, capacity 12 cubic feet | .. | 1,600 |
| | Total | 4,350 |

Recurring Expenditure.

| Establishment. | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. |
|---|---------------|---------------|---------------|---------------|---------------|
| I. Pay— | | | | | |
| (1) Special Mycologist (Rs. 320—40—800). | 3,840 | 4,320 | 4,800 | 5,280 | 5,760 |
| (2) Clerk (40—5/2—80) .. | 480 | 480 | 540 | 540 | 600 |
| (3) Peon at Rs. 18 per mensem | 216 | 216 | 216 | 216 | 216 |
| Virus Diseases Scheme— | | | | | |
| (1) Graduate Assistant (Rs. 150—5—200). | 1,800 | 1,860 | 1,920 | 1,980 | 2,040 |
| (2) Non-Graduate Assistant (Rs. 40—5/2—80). | 480 | 480 | 540 | 540 | 600 |
| (3) Laboratory Boy at Rs. 18 per mensem. | 216 | 216 | 216 | 216 | 216 |
| Physiologic Forms Scheme— | | | | | |
| (1) Graduate Assistant (Rs. 150—5—200). | 1,800 | 1,860 | 1,920 | 1,980 | 2,040 |
| (2) Non-Graduate Assistant (Rs. 40—5/2—80). | 480 | 480 | 540 | 540 | 600 |
| (3) Laboratory Boy at Rs. 18 per mensem. | 216 | 216 | 216 | 216 | 216 |
| II. Travelling allowance— | | | | | |
| (1) Special Mycologist and his peon. | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 |
| (2) Staff | 500 | 500 | 500 | 500 | 500 |
| III. Contingencies— | | | | | |
| Including apparatus chemicals and cultivation charges— | | | | | |
| (1) Virus diseases scheme | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 |
| (2) Physiologic forms scheme. | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| IV. Reserve | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Total | 18,528 | 19,128 | 19,908 | 20,508 | 21,288 |

Total for above (non-recurring and recurring) is Rs. 1,03,710.

ENCLOSURE I.

Greenhouse.—The details for building a green-house may be given as below :—

(1) Dimensions—15 × 30 ft.

(2) Glass roof and wooden trellis work on sides and Shahabad stone paving.

| | Rs. | A. | P. |
|---|-------|----|----|
| Roof—(glass panes 540 sq. ft.) | 300 | 0 | 0 |
| Trellis—(90' × 8'—720 sq. ft.) | 400 | 0 | 0 |
| Brick pillars—(8 × 1½ × 1½ × 8) | 60 | 0 | 0 |
| Paving—(30' × 15'—450 sq. ft.) | 250 | 0 | 0 |
| Wooden benches—(three) | 75 | 0 | 0 |
| Water basin | 40 | 0 | 0 |
| Piping (perforated) to make showers of rain | 200 | 0 | 0 |
| Finishing (paint, etc.) | 100 | 0 | 0 |
| Curtains (to protect from heat in summer) | 100 | 0 | 0 |
| Glass moist chamber | 100 | 0 | 0 |
| Muslin chambers for rust cultures and inoculation | 100 | 0 | 0 |
| Miscellaneous | 275 | 0 | 0 |
| | 2,000 | 0 | 0 |

Frigidare.—This is a very essential piece of apparatus which will be used in connection with both the investigations. In the investigation on physiologic forms, the uredinial material has to be preserved in a cool place before it will be used for inoculating the differential hosts. While studying the physiology of the different plant viruses and in making cross-inoculation studies, the viruses should be kept in a cool place, as high temperatures inactivate them. The importance of this apparatus is therefore obvious.

Special Mycologist.—As has been pointed out in the forwarding letter, the advantage of appointing one man to hold charge of both the schemes is to effect saving in the pay as ordinarily two men will be required, and in this way it will also be possible to engage a well-trained investigator by offering him a better pay.

Clerk.—There will be considerable office work and it will not be possible for the office clerk of the Plant Pathologist to Government, Bombay, to help the Special Mycologist in typing reports, preparing contingent, pay and travelling allowance bills, and carrying on the normal correspondence which these investigations will make necessary.

Travelling allowance.—It will be necessary for the Special Mycologist to undertake extensive touring in the Bombay Presidency, the Central Provinces and the Kathiawar States in connection with both the investigations, and the provision of Rs. 2,500 for the Special Mycologist and his peon for this purpose will barely be sufficient. It may be noted that the Special Mycologist will be able to manage his work within this grant, since in his tours, he will be able to collect data bearing on both the problems. This arrangement will effect considerable saving on the travelling allowances.

The provision of Rs. 500 for the staff is very moderate.

Contingencies.—The sum of Rs. 5,000 per annum has been provided for contingencies under both the schemes, and this may be considered as the minimum requirement. These include many miscellaneous charges, and some of the important items may be shown as follows: (1) cost of maintaining the greenhouse at Poona; (2) cultivation expenses at the various rust nurseries in Bombay, C. P. and the Kathiawar states; (3) provision for labour; (4) cultivation expenses in connection with the virus diseases of chillies, *bhendi* and carda-

mom ; (5) maintaining a small laboratory at Sirsi for the virus disease of cardamom ; (6) cost of making insect proof muslin cages ; (7) cost of insecticides for the control of insect vectors ; (8) cost of transport of plant materials and specimens ; (9) sprayers, etc., (10) laboratory material including reagents for cytological work ; (11) seed and plant material for study ; (12) contingent charges of the office of the Special Mycologist including postage stamps, etc., etc., etc. In fact, the provision will represent the minimum requirement, and it will not be possible to reduce this figure.

Reserve.—A reserve grant of Rs. 1,000 per annum is provided as it is not always possible to make provision for unforeseen expenditures. If at the end of the year, a portion or whole of this grant is not used, it will lapse to the Imperial Council of Agricultural Research.

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ENCLOSURE II.

NOTE BY DR. K. C. MEHTA, M. SC., PH. D., ON THE SCHEME FOR CO-OPERATIVE INVESTIGATION BETWEEN THE PLANT PATHOLOGIST TO GOVERNMENT, BOMBAY AND THE MYCOLOGIST TO GOVERNMENT, CENTRAL PROVINCES ON THE PHYSIOLOGIC FORMS OF BLACK RUST FUNGUS OF WHEAT.

(1) A scheme for investigations on rusts of cereals in India is already in force under the auspices of the Imperial Council of Agricultural Research.

(2) As far as India is concerned even the life-history of the black rust of wheat is yet obscure and the problem is being investigated at Simla and Almora.

(3) It is premature therefore to conclude that barberry is definitely responsible for fresh out-breaks of black rust in India. In fact, work done during the last 8 years indicates that the factor of outstanding importance is the survival of uredospores from season to season in the hills.

(4) In the absence of a definite proof of *Berberis* being an intermediate host for black rust of cereals in this country it is unsound to presume that there is a large number of physiologic forms of black rust that one has to deal with. Recent work in America has clearly shown that the ever increasing number of physiologic forms is due to hybridisation of different strains on *Berberis Vulgaris*.

(5) It may be mentioned here that *Berberis Vulgaris* is exceedingly rare over the greater part of the area under cultivation in the hills in India.

(6) I have recently had an opportunity of discussing the present position of the cereal rust problem in India with some of the foremost workers in the field including Professor Stakman, the discoverer of "physiologic forms" of black rust of cereals.

(7) It is my candid opinion that before rushing into a big scheme we have to make sure of the fundamental fact whether there is at all a large number of physiologic forms of black rust in our country. I am of the opinion that on account of the absence of *Berberis Vulgaris* over the greater part of the crop area in the hills it is very unlikely that we may have even half a dozen forms as against nearly 100 forms in U. S. A. In support of the above statement I would like to quote the case of Australia and Kenya where work on Physiologic forms has been recently done. Like India barberry is rare in both those areas and what do we find only 6 forms in Australia out of which only one is dominant and there are only 2 forms in Kenya.

(8) Another important fact to bear in mind is that in India there are two other rusts—on wheat and one on barley which demand the same amount of attention at our hands as they are even more destructive than black rust in several important areas under wheat and barley.

(9) As far as the scheme under report is concerned work on rusts without a laboratory in the hills is possible only for 2—3 months in the year and each year would mean a repetition of previous work because cultures can not be kept going during summer on the plains.

(10) The basic work on rusts in India has got to be done in the hills and there is no getting out of that because of the conditions of weather. Workers like Prof. Stakman, Dr. Newton, Dr. Butler, Sir Biffen and others are in complete agreement with me on this point.

(11) Work on physiologic forms of all the three rusts of wheat is badly needed in India and the problem being an all-India one, it is only right that work on different aspects be properly correlated in the interest of efficiency and economy. I for one cannot see the advantage of divorcing the scientific part of the investigations from the applied part because the former forms the basis for all measures of control.

(12) As a result of the discussion which I have recently had with Professor Stakman, I am going to start work of isolating collections of rust material from several places in the country with the object of making a preliminary study of physiologic forms of all the *three rusts*. Seeds of differential hosts are expected shortly from Messrs. Stakman, Mains and Hungerford, the three authorities on physiologic forms of black, brown and yellow rust respectively. The work will be done in the laboratories at Simla and Ahnora where cultures of rusts can be kept going all the year round.

(13) It is hoped that by April 1932 we will be able to get at the truth of the phenomenon, whether there are many physiologic forms under each of the three morphological species. By that time we also hope to know more about the life histories of black and brown rusts. A comprehensive scheme will then be prepared for work on all the three rusts and the co-operation of plant pathologists with provincial governments in the area of wheat cultivation would be indispensable.

(14) I am very glad to learn that besides myself there are workers interested in the cereal rusts problem in India and it would be a source of great pleasure and encouragement to me to seek their co-operation and to render them whatever help I can. When a more comprehensive scheme for different aspects of the problem is under preparation the plant pathologist of Bombay will be consulted along with others for the share of work each is willing to take up.

(15) Work on Cereal rusts and the breeding of resistant varieties is a large national scheme and cannot be undertaken without adequate equipment and laboratory facilities at suitable hill stations.

(16) For all practical measures the plant pathologists and plant breeders will have to work conjointly.

(17) I am sure that without preliminary study of the phenomenon of physiologic forms and until such time that we understand the life histories of the parasites concerned, isolated investigations on one single aspect of this huge problem will serve no useful purpose.

APPENDIX XIV.

APPLICATION FROM DR. S. S. BHATNAGAR FOR A GRANT OF
Rs. 3,000 A YEAR FOR TWO YEARS TO STUDY THE EFFECT OF
IONS ON PLANT GROWTH.

Attention is invited to the attached application (Enclosure I) from Dr. S. S. Bhatnagar for a grant of Rs. 3,000 a year for two years to study the effect of ions on plant growth. The application has been approved by the Provincial Agricultural Research Committee (Enclosure II) and the Government of the Punjab, who are willing to provide the necessary facilities for Dr. Bhatnagar's work at Lahore. It was not received in time to be placed before the Advisory Board at its last meeting held at Simla in June 1930. In this connection, it may be mentioned that, in accordance with the recommendation made by the Advisory Board in response to memorandum No. 2135-Agri., dated the 3rd October 1930, the Governing Body has sanctioned for Dr. Bhatnagar an *interim* grant of Rs. 1,600 only without committing the Council to the larger scheme, which is now submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

The 26th November 1930.

ENCLOSURE I.

Copy of letter, dated the 30th January 1930, from Professor S. S. Bhatnagar, D.Sc., F.Inst.P., Director, University Chemical Laboratories, Lahore, to the Secretary, The Agricultural Research Council, Delhi, through the Vice-Chancellor, University of the Punjab, Lahore.

For the last two years we have been carrying on research work on the effect of ions on the growth of wheat and gram. This work suggested itself to us by the publication of the classical experiments performed at Rothamsted showing that broad beans are quite unable to flower or set seed if they are entirely deprived of boron, and that these and such other plants which are almost *in extremis* from lack of boron can be cured and started into healthy growth by the addition, to the soil, of a quantity of boric acid less than one in two and a half million parts.

We have obtained interesting results with wheat and gram crop grown in water cultures with regard to the catalytic effect of several ions. Silver ions have been found to make gram crop very resistant to excessive cold and frost and copper ions have helped in the preservation and subsequent maturing of wheat. Several other ions are discovered which though ordinarily toxic to certain plants proved growth promoting when applied in traces. These ions are thorium, zinc and barium for wheat and thorium, manganese and cobalt for gram. We wish to extend this work for wheat, gram and cotton in the midst of field conditions in the Punjab and I shall feel grateful to you if you could award me a grant of Rs. 3,000 a year for this work.

ENCLOSURE II.

Proceedings of the Special Committee appointed by the Provincial Council of Agricultural Research (Punjab), to make recommendations to the Council on applications for grants to the Imperial Council of Agricultural Research.

* * * * *

2. Dr. Bhatnagar applied for a grant of Rs. 3,000 a year for two years to study "*The Effect of Ions on Plant Growth*".

The investigation involves an extension of water culture experiments already initiated, to pot cultures and field work. The programme was discussed and approved.

It is proposed to spend the grant as follows :—

| | Per annum. |
|---|------------|
| | Rs. |
| Pay of one Research Chemist of several years' experience in research work on Rs. 200 per mensem | 2,400 |
| Pay of half-time laboratory Assistant (<i>vide</i> application No. 1) on Rs. 25 per mensem | 150 |
| Travelling allowance under Fundamental Rules up to a maximum of | 450 |
| | 3,000 |

The Committee decided to recommend the Provincial Council to ask the Imperial Council for this grant for two years.

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APPENDIX XV.

APPLICATION FROM DR. S. S. BHATNAGAR FOR A GRANT OF
Rs. 4,150 A YEAR FOR TWO YEARS FOR INVESTIGATIONS ON
THE RELATION BETWEEN THE PHYSICO-CHEMICAL PRO-
PERTIES AND THE FERTILITY OF SOILS.

Attention is invited to the attached application (Enclosure I) from Dr. S. S. Bhatnagar for a grant of Rs. 3,000 for one year to conduct investigations on the relation between physico-chemical properties and the fertility of soils. The application has been revised (Enclosure II) by the Provincial Agricultural Research Committee and the Government of the Punjab, who are willing to provide facilities for Dr. Bhatnagar's work at Lahore. As revised, the amount of the grant applied for has been raised to Rs. 4,150 a year for two years. The application was not received in time to be placed before the Advisory Board at its last meeting held at Simla in June 1930. It is accordingly now submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

The 26th November 1930.

ENCLOSURE I.

Copy of letter No. 292]V.C., dated the 31st January 1930, from the Vice-Chancellor, University of the Punjab, Lahore, to the Secretary, Imperial Council of Agricultural Research, Delhi.

I have the honour to forward for favourable consideration two applications for assistance in research by Dr. Bhatnagar, University Professor of Physical Chemistry and Director of University Chemical Laboratories, Lahore. Dr. Bhatnagar is a researcher of very considerable ability, who has built up a school of chemical research in Lahore. He has been making a special point of bringing the research work done in his laboratories into connection with various problems of practical importance. I feel sure that any grant the Research Council is able to assign to him will be well spent and believe that it is quite likely to result in discoveries of economic importance.

Copy of letter, dated the 29th January 1930, from Professor S. S. Bhatnagar, D.Sc., F.Inst.P., Director, University Chemical Laboratories, Lahore, to the Secretary, Imperial Council of Agricultural Research, Delhi (through the Vice-Chancellor, University of the Punjab, Lahore).

I have the honour to request you to kindly allot me a grant of Rs. 3,000 for investigations on the relation between Physico-chemical properties and Fertility of Soils. My scheme of work will be as follows :—

The whole province will be divided into a number of climatic zones and representative soil samples will be taken from each area. The fertility value will be ascribed to each sample from a knowledge of the cropping history, ascertained from the actual farmers and other men on the spot and the Agricultural Department.

These samples will be subjected to a comprehensive physico-chemical analysis, and a correlation worked out between the laboratory data, and fertility value already known from actual growers of crops. This will not only give us a method of evaluating soil fertility in terms of easily determinable factors, but it will also afford valuable data regarding the question of enhancing the fertility of a particular soil. Attention will also be directed towards the question of evolving simple methods that could be used actually on the field with the minimum of equipment, for finding out soil fertility.

We have got sufficient laboratory equipment to cope with this work, but we are handicapped for want of adequate assistance to carry out the necessary routine work involved. One field man and an assistant will be required to enable me to take up the work and the above grant will be utilised to pay these assistants. The grant asked for is for one year, in the first instance.

ENCLOSURE II.

Proceedings of the Special Committee appointed by the Provincial Council of Agricultural Research (Punjab) to make recommendations to the Council on applications for grants to the Imperial Council of Agricultural Research.

Present :—D. Milne, Esq. (Director of Agriculture, Punjab) ; R. B. Jai Chund Luthra, Dr. P. E. Lander, Dr. S. S. Bhatnagar, Dr. J. N. Ray, Dr. H. B. Dunncliff, Convener (in the chair).

(1) Application of Dr. S. S. Bhatnagar for funds to conduct an investigation into the *Relation between Physico-chemical Properties and the Fertility of Soils*.

Dr. Bhatnagar explained his programme of research which in the opinion of the members, would cover about five years' work. The Committee discussed and accepted the problem and decided to recommend that the Imperial Council be requested to provide a sum of Rs. 4,150 a year for two years in the first instance. The question of renewal would be decided on the progress achieved. This sum would be used in the following way :—

| | Rs. |
|--|-------|
| (1) Pay of one research assistant (an M.Sc. in Chemistry or Post M.Sc. research chemist) at Rs. 150 per mensem | 1,800 |
| (2) Pay of one field man (a B.Sc. Ag. of the Agricultural College, Lyallpur), Rs. 100 per mensem | 1,200 |
| (3) Pay of one half-time Laboratory Assistant [<i>vide</i> application (2)], at Rs. 25 per mensem Rs. 12-8 | 150 |
| (4) Travelling allowance admissible under Fundamental Rules up to a maximum for the year of | 1,000 |
| | 4,150 |

The Laboratory work would be carried on in the University Laboratories at Lahore. Expenses for materials and contingencies would be borne by the University Laboratory and the Director of Agriculture would give, free of expense, all farm facilities.

The Committee unanimously recommend that the Provincial Council for Agricultural Research request the Imperial Council for Agricultural Research to grant a sum of Rs. 4,150 per annum for two years for this problem to be carried out under the (honorary) direction of Dr. S. S. Bhatnagar.

APPENDIX XVI.

SCHEME FOR THE APPOINTMENT OF A PHYSICAL ASSISTANT ON
THE STAFF OF THE AGRICULTURAL CHEMIST, BENGAL.

The attached scheme from the Government of Bengal for the appointment of a Physical Chemist on the staff of the Agricultural Chemist, Bengal, is submitted for the consideration of the Advisory Board. It will be noted that this scheme is in certain respects complementary to the scheme of research in soil chemistry for which the Council has already sanctioned a grant to Dacca University and that the proposed grant, if sanctioned, will enable the Agricultural Chemist, Bengal, to collaborate more effectively with the University Chemical Department.

The scheme involves a total expenditure of Rs. 22,568-8-0 (including Rs. 868-8-0 non-recurring) spread over a period of 5 years.

M. S. A. HYDARI,
Secretary.

**APPOINTMENT OF A PHYSICAL ASSISTANT ON THE STAFF OF THE
AGRICULTURAL CHEMIST, BENGAL.**

Apart from routine, most investigations into soil problems have a general interest. Keeping this in mind, it is interesting to note that, as far back as 1926, the Government of Bengal agreed that investigation into physical problems connected with soils is advisable, and sanctioned the appointment of a Physical Assistant on the staff of the Agricultural Chemist. Unfortunately funds have never yet been available to bring this appointment into being.

About the same time friendly co-operation between the Dacca University and the Department of Agriculture in Bengal, in joint investigation of problems of agricultural interest, commenced, and the scheme under which the University is to receive grants for research into problems of a physical nature connected with soil, also into the factors connected with the nutrition of paddy, is a direct result of this collaboration.

As arranged and sanctioned by the Governing Body of the Imperial Council of Agricultural Research, the Dacca University is to take up the investigations in question, but at various stages in the investigation it will be of critical importance to discuss the practical bearing of any results which may be obtained, and to put such results to a field test. There can be no doubt as to the value of such an arrangement which will ensure that any results obtained in the laboratory will be assayed on a field scale, without any unnecessary delay.

Mr. Carbery, the Agricultural Chemist, has already more work than it is possible for him to do, and, without extra help, it is impossible to keep up more than a semblance of the collaboration, between the laboratory and the field, which is so important in investigations of this kind. Moreover, the Advisory Board of the Imperial Council of Agricultural Research has recently recommended a scheme for investigation of soil colloids by the Calcutta University, and it is hoped that the Department of Agriculture may be able to collaborate with the Calcutta University in the same way as with the Dacca University. It is necessary to add that neither University has the land, or the trained staff, to carry out such practical field tests on their own, and it is because of this that the appointment asked for is likely to be of such value.

In addition to the above, the Agricultural Chemist in Bengal has a comprehensive programme for physical and chemical research into soils, the results of which would certainly be of general interest. The programme includes :—

- (1) Soil moisture, the means by which it is retained by different soils, and the respective capacities of the latter to deliver soil moisture to plant growth. Maximum capacity of retention.
- (2) How the retentive capacity of the various types is affected by soil temperature at various times of the year.
- (3) The relation between soil moisture and the plant as influenced by (a) addition of soluble fertilisers, and (b) addition of lime when necessary.
- (4) The influence of the more common crops on moisture content and the minimum moisture content required to produce a normal yield.
- (5) Rate of evaporation.
- (6) Incidence of rainfall and its effect.
- (7) Capillary action.

These investigations have not only a direct relation to the productivity of crops but to the cost of production. On irrigated land a knowledge of the moisture capacity of the soil will not only enable the cultivator to reap a maximum crop but ensure him against spending money on excessive irrigation.

As the post is temporary, the pay of the assistant to be entertained will be Rs. 250 per mensem, and the following expenditure will be required :—

Recurring expenditure.

| | 1st Year. | 2nd Year. | 3rd Year. | 4th Year. | 5th Year. | Total. |
|---|--------------|--------------|--------------|--------------|--------------|---------------|
| | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| Pay of assistant at Rs. 250 per month. | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 15,000 |
| Laboratory servant at Rs. 20 per month. | 240 | 240 | 240 | 240 | 240 | 1,200 |
| Chemical and apparatus | 500 | 500 | 500 | 500 | 500 | 2,500 |
| Travelling allowance | 600 | 600 | 600 | 600 | 600 | 3,000 |
| Total | 4,340 | 4,340 | 4,340 | 4,340 | 4,340 | 21,700 |

i.e., Rs. 4,340 each year for five years.

It is understood that all ordinary apparatus, such as flasks, etc., will be available from the main laboratory stock and will not be charged to the Research Council. Only new apparatus of a special nature will be so charged.

It is also understood that the Bengal Department of Agriculture will provide facilities for all field experiments which may be necessary.

Non-recurring expenditure.

Special apparatus outside ordinary laboratory equipment, which will be necessary for such work as per detailed list below :—

| | Rs. | A. |
|--|-----|----|
| Apparatus for thorough mixing or sampling of soil in bulk | 120 | 0 |
| Constant volume bottle (Haines) for measuring soil shrinkage | 12 | 8 |
| Collin's Calcimeter for estimation of Carbonates in soils .. | 90 | 0 |
| Boxwood slide rule for above | 9 | 0 |
| Pipette with two way top (3)* | 31 | 0 |
| Graduated jar (1,000 c.c.) (3)* | 28 | 0 |
| India-rubber cork to fit above (3)* | 9 | 0 |
| Sieves for mechanical analysis of soils (8 cm. diam. by 4 cm. deep), No. 70, Institute of Minine and Meteorology, suitable for the international standard 0.2 mm. (12) | 153 | 0 |
| Ditto with 2 mm. diam. perforation (6) | 45 | 0 |
| Brass box with perforated loose bottom to take a filter paper 2 inch. diam., to estimate moisture holding capacity, swelling capacity, etc., of soils (6) | 45 | 0 |

* For use in the apparatus (already available) for the mechanical analysis of soil by the new official method.

| | Rs. A. |
|---|--------|
| Silica dishes (12 × 50 mm.) (24) for moisture determination | 60 0 |
| Alluminium covers for above (24) | 21 0 |
| Soil Auger with sleeves for use in dry soils | 70 0 |
| Extension for use with above | 20 0 |
| Balance (dial type) weighs up to 24 lbs. in 1 oz. divisions | 13 0 |
| Ditto weighs | 10 0 |
| Alluminium boxes (numbered) for moisture determination with caps, No. 1—24 (No. A) | 30 0 |
| Soil acidity tester (Trong) for determining lime requirements in the field (complete set) | 30 0 |
| Extra parts for above | 32 0 |
| Capillary tubes (graduated) (3) | 40 0 |
| Total | 868 8 |

Total charges are estimated as follows :—

| | Rs. A. |
|---|----------|
| Recurring (Rs. 4,340 each year for 5 years) | 21,700 0 |
| Non-recurring (cost of apparatus and equipment) | 868 8 |
| Total | 22,568 8 |

R. S. FINLOW,
Director of Agriculture, Bengal.

DACCA,
The 6th August, 1930.

APPENDIX XVII.

APPLICATION OF THE U. P. DEPARTMENT OF AGRICULTURE FOR
A GRANT OF Rs. 5,000 FOR 3 YEARS FOR EXPERIMENTS ON
MANURING AND MARKETING NEW TYPES OF BARLEY.

A number of new strains of barley were isolated by the Assistant Economic Botanist in 1927 and 4 of these are now being distributed in the principal barley growing tracts of the province.

Samples of grain have been sent for examination by experts of the Institute of Brewing, London, who were impressed by their quality and superiority to the barley usually shipped to their country. The Institute submitted through the Secretary of State and the Government of India a request to the U. P. Government to extend this work and offered the assistance of the Barley Research Committee. This offer has been accepted.

Three important points for examination are :—

- (i) Methods of packing for shipment
- (ii) Manurial requirements.
- (iii) Further investigation of types cultivated in districts which have not been completely surveyed.

In subsequent correspondence with the experts of the Institute it has been decided that the best course would be to send samples of 50 quarters of grain of selected types for a period of 5 years for duplicate or triplicate brewing tests and at the same time to examine methods of packing and times of shipment. The experiments on packing with samples grown by cultivators will be started in the Rabi of 1931.

Three kinds of containers will be tried :—

- (i) Double Hessian bags,
- (ii) Jute canvas bags,
- (iii) Single jute bags,

with the object of deciding which type of material affords the best protection against deterioration of germinating capacity during transit.

It is proposed to carry out the manurial experiments at the Cotton Research Farm, Raya, in the Muttra district : as these can be easily fitted in with cotton experiments. The manurial scheme will be framed with the object of ascertaining the effect of varying dressings of nitrogen in forms commonly available on the quality of barley under Indian conditions.

The U. P. produces 60 per cent. of the barley grown in India and there is still a large area in the eastern and north-eastern parts of the province in which the types grown have not been examined. It is proposed to make a collection of types from these districts and isolate pure cultures.

The U. P. Department of Agriculture have received numerous communications from exporting firms, trade commissioners, and others interested in developing the barley trade indicating the eagerness of barley consumers overseas to obtain increased supplies from the surplus stocks available for export from the United Provinces, and there is little doubt that a premium would be paid for types of barley which meet the requirements of the overseas market.

The broad details of the expenditure involved are given in the Annexure.

The Imperial Council of Agricultural Research is asked to provide a grant of Rs. 5,000 for 3 years (a total grant of Rs. 15,000) for this work subject to the condition that a report on the results of the work done will be submitted by the Assistant Economic Botanist through the Local Government at the end of 12 months from the date on which the grant is placed at the disposal of the Local Government and thereafter at yearly intervals during the currency of the grant.

The scheme for which assistance is now sought appears to the U. P. Government to fulfil the conditions laid down in paragraph VI of the memorandum* on the constitution and functions of the Empire Marketing Board and the Imperial Council are asked if they cannot entertain the application themselves to forward it to the Empire Marketing Board for consideration according to the procedure laid down in paragraph VII of the memorandum* referred to above.

With regard to the contribution of the Local Government to the scheme it is impossible to give separate figures for the amounts allotted to barley investigations but evidence that the contribution exceeds the sum asked for is furnished by the following :—

The total budget allotment of the Assistant Economic Botanist is Rs. 30,164 plus Rs. 11,580 pay of 7 members of the Subordinate Agricultural Service. He is working on three problems, cotton, barley and wheat.

*Not printed.

ANNEXURE.

Estimated items of expenditure from the grant of Rs. 5,000 applied herewith.

| | Rs. | A. | P. |
|--|-------|-------|-------|
| 1. Sample of 300 maunds of barley at Rs. 4\|8\|- per maund | 1,350 | 0 | 0 |
| 2. Packing | 120 | 0 | 0 |
| 3. Loading and other handling charges at -\|1\|- per bag | 9 | 6 | 0 |
| 4. Railway freight to Karachi at -\|12\|- per maund .. | 225 | 0 | 0 |
| 5. Unloading and other charges at -\|4\|- per maund .. | 37 | 8 | 0 |
| 6. Steamer freight to London (estimated) .. | 250 | 0 | 0 |
| 7. Unloading and other expenses in London .. | 37 | 8 | 0 |
| 8. Other charges, commission, wharfage, customs, etc. .. | 150 | 0 | 0 |
| 9. Barley Survey—Cost of arranging the collection, pay of staff and travelling expenses, etc. .. | 2,000 | 0 | 0 |
| 10. Manurial experiments | 750 | 0 | 0 |
| 11. Rounding | 70 | 10 | 0 |
| | <hr/> | 5,000 | 0 0 |
| | | <hr/> | <hr/> |

EXTRACTS FROM THE MINUTES OF THE 2ND MEETING OF THE
UNITED PROVINCES AGRICULTURAL RESEARCH COMMITTEE
HELD ON JUNE THE 2ND, 1930.

• • • • •

III. The Committee considered an application from the Department of Agriculture, United Provinces, for a grant of Rs. 5,000 annually for 3 years for experiments in marketing new types of barley.

The application was discussed and approved and the following resolution was passed by the Committee.

“The Committee agrees to recommend to the Imperial Council of Agricultural Research, the application of the Department of Agriculture, United Provinces, for a grant of Rs. 15,000 spread over a period of 3 years for experiments on manure and marketing in new types of barley.”

APPENDIX XVIII.

The attached application from the Government of Bengal (Enclosure I) for a grant totalling Rs. 50,721 over a period of five years to meet the cost of a Physiological Chemist and staff to study animal nutrition problems in Bengal is submitted to the Advisory Board for consideration.

2. The Animal Husbandry Expert to the Council while supporting this scheme has outlined a general scheme (Enclosure II) for the employment of a similar special staff in every major province which is not at present provided with any animal nutrition research staff. It is suggested that the Bengal scheme may be considered along with, and as forming part of this general scheme.

M. S. A. HYDARI,
Secretary.

5th December 1930.

ENCLOSURE I.

Letter from the Secretary to the Government of Bengal, Agriculture and Industries Department, to the Secretary, Imperial Council of Agricultural Research, No. 5131, dated the 13th November 1930.

With reference to your letter No. 1817-Genl., dated the 17th September 1930, I am directed to forward, for consideration at the meeting of the Advisory Board to be held in January 1931, a scheme for the appointment of a Physiological Chemist to study animal nutrition problems as approved at the second meeting of the Bengal Agricultural Research Committee held on the 7th instant and to say that the Government of Bengal (Ministry of Agriculture) recommend the scheme subject to the condition that no financial liability will devolve on this Government.

2

The proposals submitted by the Live Stock Expert, Bengal, for a Nutrition Section at Dacca were submitted to me for advice, I consider the scheme sound and workable, and it is also my opinion that the work proposed is of a practical nature and most essential.

Bengal is peculiarly situated as regards animal nutrition problems, as besides the Burdwan Division in Western Bengal where climatic conditions resemble those of much of Peninsular India. It includes East Bengal where a moist climate with comparatively even temperature is, with adjacent Assam unique in India.

Investigations into the factors causing the lack of physique in Cattle in North East India is in itself a most important work. The difficulties may or may not be partly climatic but there are indications that they are at least partly nutritional. It is obvious that careful study of such difficulties will not only help Bengal but that results, when obtained, will be of value in solving general problems of animal nutrition.

It is proposed that the work at Dacca should be carried out in close collaboration with me, and I welcome such an opportunity of getting into touch with problems of the utmost importance, which are vital not only to North East India but to India as a whole.

(Sd.) F. J. WARTH.

ENCLOSURE I.

Proposal for the appointment of a Physiological Chemist to study animal nutrition problems.

For a number of years the Agricultural Department has been carrying out crop experiments with both indigenous and imported fodder crops. The critical tests so far have been yield per acre and palatability gauged by the refusal or otherwise of the stock to accept the fodder placed before them or otherwise.

Owing to lack of staff, it has not been possible to attempt the estimation of nutrition values. Yet a crop giving a high yield of green weight per acre may not be so valuable commercially as one giving a lesser outturn, if the feeding value of the latter is higher.

The appointment of a Physiological Chemist is necessary to complete the investigations begun and described above.

It is proposed that the work while directly controlled by the Agricultural Chemist, Bengal, should be generally supervised and directed by the Imperial Physiological Chemist.

Bengal offers opportunities for the study of problems in animal nutrition which are denied to other provinces. In certain areas the rainfall is as high as 200 in., whilst in others the maximum is only 50 in. The climate varies from almost arid conditions where a rainfall of 50 in. is practically confined to the monsoon months, to humid conditions unique, except in Assam, where rainfall is appreciable in ten months of the year. Soils over a considerable tract contain a sufficiency of lime, in others there is a deficiency of lime. Similarly there are areas showing a sufficiency of phosphates and potash, and others where these are deficient. Results obtained in Bengal would thus widen the basis on which general conclusions regarding nutrition can be arrived at.

The feeding of minerals to stock has been conducted in Bengal on a scale only limited by the staff available. Results have been estimated on the general health of the animals, no detailed investigation being possible. Generally speaking the addition of lime to the diet has shown little or no improvement.

Feeding of bonemeal has certainly improved the appearance of the stock, whilst diminution in the incidence of pneumonia in the young stock at Rangpur, and warts at Dacca, seems to be definitely connected with the inclusion of iodine in the ration. These observations follow generally those made in other countries and might be expected in a rain-washed tract like that in question. At the same time it has been pointed out by physiological chemists that results obtained for a particular area should not be generally applied without previous experiment. The effects of such blind application may be neutral, or even deleterious.

The Department can offer facilities for—

(1) Laboratory Accommodation at Dacca.

(2) Experiments on stock—

(a) At Rangpur in North Bengal.

(b) At Dacca in East Bengal.

(c) At Chinsura in West Bengal.

(d) At Berhampore in Central Bengal.

These farms are in different belts with a wide difference in soil, climate and rainfall.

(3) Cultivation of fodder crops on twenty farms in the Presidency so that the nutrition value can be estimated in the laboratory and eventually on stock.

The scheme has been drawn up in consultation with the Imperial Physiological Chemist and the estimated expenditure over a period of five years, of which details are attached is as follows :—

| | |
|-----------------------|--------|
| | Rs. |
| Non-recurring | 2,131 |
| Recurring | 48,590 |

As the scheme is of undoubted importance and interest to India generally as well as to Bengal, it is hoped that the Imperial Council of Agricultural Research will provide funds.

The Department of Agriculture, Bengal, will bear all charges connected with feeding of stock, and with casual labour.

Detailed expenditure for staff, total non-recurring and recurring expenditure, for the full scheme is given below :—

| | |
|---|--------|
| | Rs. |
| Total non-recurring expenditure (as per list attached) .. | 2,131 |
| Total recurring expenditure for a period of five years .. | 48,590 |
| Total required for the complete scheme .. | 50,721 |

Detailed expenditure for staff and total of recurring expenditure.

| | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|
| | Rs. | Rs. | Rs. | Rs. | Rs. |
| Chemist | 3,600 | 3,600 | 4,200 | 4,800 | 5,400 |
| Assistant Chemist | 1,920 | 2,160 | 2,400 | 2,600 | 2,880 |
| 1 Clerk | 360 | 360 | 420 | 420 | 450 |
| 1 Fieldman | 360 | 300 | 420 | 420 | 450 |
| Peons | 312 | 312 | 312 | 312 | 312 |
| Contingencies | 770 | 770 | 770 | 770 | 770 |
| Travelling allowance* | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| House rent† | 240 | 240 | 240 | 240 | 240 |
| | 7,962 | 8,802 | 9,762 | 10,562 | 11,502 |
| Grand total for five years .. | 48,590 | | | | |

Explanations.

*The Chemist and a Fieldman will have to tour in the Province, visiting different farms.

†There is no accommodation for officers on the Dacca Farm. An allowance is granted to officers drawing below Rs. 100 per mensem.

List A.—Non-recurring expenditure—Apparatus.

| | Rs. A. |
|--|--------|
| Small oven | 150 0 |
| One set of Kilogramme weights from 100 gr. to 10 kgs. .. | 25 0 |
| 2 Weight boxes (small) | 15 0 |
| 2 Grinding mills | 500 0 |
| | 690 0 |

List B.—Non-recurring expenditure—Nutrition stall equipment.

| | Rs. A. |
|---|---------|
| 2 Almirahs | 100 0 |
| 2 Ration cupboards | 100 0 |
| 1 Beam balance | 30 0 |
| Table balance for weighing concentrates | 50 0 |
| 6 Lanterns | 15 0 |
| Wash basins for sampling faces | 6 0 |
| 12 Enamelled plates | 7 8 |
| 40 Urine bags at Rs. 6 each | 240 0 |
| 40 Rubber corks | 40 0 |
| 36 Clips | 20 0 |
| 1 Ice chest | 100 0 |
| 24 Enamelled buckets | 100 0 |
| 24 Bottles with stoppers, 5 litre | 140 0 |
| 24 Enamelled mugs (12 big and 12 small) | 16 0 |
| 12 Enamelled funnels | 9 0 |
| 12 Chamber pots | 18 0 |
| Office furniture, typewriter | 350 0 |
| | 2,131 8 |

Total non-recurring expenditure .. 2,131 8

Recurring expenditure.

(Touring.)

Staff*—

- 1 Chemist on Rs. 250 to Rs. 750.
- 1 Assistant Chemist on Rs. 160 to Rs. 300.
- 1 Clerk on Rs. 30 to Rs. 50.
- 1 Byre Overseer on Rs. 30 to Rs. 50.
- 2 Peons on Rs. 13 to Rs. 15.

*For details, see attached statement.

Chemicals (recurring).

| | Rs. | A. |
|---|-----|----|
| Sulphuric acid free from nitrogen, 100 lbs. | 100 | 0 |
| Sodium hydroxide, 100 lbs. | 50 | 0 |
| Sodium sulphate (anhydrous), 30 lbs. | 30 | 0 |
| Copper sulphate, 10 lbs. | 12 | 0 |

Details of contingencies (recurring).

(Apparatus and chemicals as per attached list.)

| | Rs. | A. |
|---|------------|----------|
| Upkeep and replacement of apparatus | 100 | 0 |
| Ordinary chemicals | 200 | 0 |
| Upkeep on stalls, etc. | 200 | 0 |
| Office and miscellaneous | 78 | 0 |
| Total | 770 | 0 |

ENCLOSURE II.

Note by the Animal Husbandry Expert to the Imperial Council of Agricultural Research.

I am in full agreement with the proposal put up by the Live Stock Expert, Bengal, for a Physiological Chemist and I consider that similar appointments should be made in every major province of India which is not at present provided with any animal nutrition research staff.

The Royal Commission on Agriculture in India points out that in western countries, in order to make the best use of their cattle, the study of nutritional problems is now being dealt with at numerous institutions, and that no one institution can hope to deal successfully with so wide a range of problems as now await solution in India.

They recommend that a combined attack on animal nutrition problems should be planned, and in my view the best and most economical method of attack would be to arrange for an animal nutrition section in every major province, to work in close touch with the proposed enlarged nutrition institute at Dehra Dun, and in collaboration with the Live Stock Experts and Directors of Veterinary Services of Provinces. The amount of work to be done is so enormous that without some such organisation it will be impossible to make satisfactory progress with the study of locally grown forage crops within a reasonable period.

Moreover, apart from the great practical benefit to be derived from a systematic study of the feeding values of the various forage crops produced, Physiological Chemists are required to collaborate with Provincial Veterinary Investigating Staffs in the study of local disease conditions.

Though little exact information is available many of these are known to be associated with nutritional deficiencies, in the forage grown under the very varying conditions of soil and climate met with in different parts of India.

In countries where fuller use has been made of veterinary and chemical science in the study of disease, it has been found necessary to provide for such collaboration, and I consider that this Council would be rendering a great service to the Live-Stock Industry of India by assisting provinces to study their nutritional problems.

It is no doubt desirable that Provinces should bear a substantial portion of the cost of such provision, and in any case they should provide the necessary accommodation, but in view of the existing financial stringency I consider that the Council would be justified in undertaking to bear the entire cost of the proposed staff and equipment in such cases, for 5 years, provided that the Government concerned would undertake to find the necessary buildings and accommodation.

The position in Bengal is not very different from that in other provinces and I would strongly recommend that the Council should consider the desirability of offering similar assistance to such major provinces and States as desire assistance so that the combined attack recommended by the Royal Commission may be instituted simultaneously all over India.

The cost per province would be roughly Rs. 10,144 per annum, while the benefit to the Live-Stock Industry should be enormous.

Without such an organization, progress in nutrition research must be very slow, and it will be a long time before it will be possible to provide the exact information required, in order that the best use may be made of the forage obtainable.

The staff and equipment asked for in this case appears to be reasonable and might serve as a basis for other provinces similarly placed.

Sd. A. OLVER, Col.

APPENDIX XIX.

APPLICATION FROM DR. H. C. CHAUDHURI FOR A GRANT OF
Rs. 12,600 SPREAD OVER 3 YEARS FOR INVESTIGATION OF THE
"WITHER TIP" OF THE CITRUS TREE.

Attention is invited to the attached application (Enclosure I) from Dr. H. C. Chaudhuri for a grant of Rs. 8,000 a year for 5 years to complete his work on the "wither tip" of the citrus tree. The application has been revised (Enclosure II) by the Provincial Agricultural Research Committee and the Government of the Punjab. As revised, the grant for the scheme has been reduced to Rs. 12,600 spread over 3 years. The necessary facilities for carrying out field work and the apparatus, etc., required, will be provided by the Local Government. The application was not received in time to be placed before the Advisory Board at its last meeting held at Simla in June 1930. It is accordingly now submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,

Secretary.

The 26th November 1930.

LOGSICAR

- (3) Appointment of a Research Assistant, Rs. 150—25—200 per month for 3 years for the present.
- (4) Part-time office clerk with knowledge of typewriting (Rs. 30) and a whole-time bearer (Rs. 20).
- (5) Contingency grant (to include expenses for photography and all minor expenses), Rs. 600 per annum.

The work may be commenced with effect from the beginning of the next financial year if the Director will agree to meet the above extra expenditure of about Rs. 4,000 (rupees four thousand per annum). If this scheme is given effect to for three years in the first instance as an experimental measure, I am confident the Director will never regret his decision.

ENCLOSURE II.

Proceedings of the meeting of the Sub-Committee appointed by the Punjab Agricultural Research Council to consider Dr. Chaudhuri's scheme, held in the Biological Laboratory of the Government College, at 9-30 a.m., on the 2nd May 1930.

PRESENT :

Dr. H. Chaudhuri.
 Rai Sahib Prof. Jai Chand Luthra.
 Dr. K. R. Mohindra.
 Prof. D. P. Johnston.
 Prof. S. N. Kashyap, Convener (in the chair).

1. It was agreed that the "wither tip" of the Citrus tree proposed by Dr. H. Chaudhuri for investigation is an important and desirable problem for investigation and he may take it up. The study should include the life-history of the casual organism, if any, and other factors concerned, and the measures of control. The Committee finds that the problem has already been under investigation under the guidance of Dr. Chaudhuri but a great deal of further work is necessary to complete it.

2. The requirements for the investigation are given below :—

- (a) A Research Assistant on Rs. 150—25—200 for three years.
- (b) A Laboratory and Field Attendant on Rs. 25 for 3 years.
- (c) Travelling allowance up to a maximum of Rs. 1,000 per year.
- (d) Contingent grant of Rs. 600 per year.
- (e) Initial equipment—non-recurring Rs. 600.

Details of the expenditure for the 3 years :—

| | | | | Rs. |
|----------------------------|----|----|----|-------|
| I year—Research Assistant | .. | .. | .. | 1,500 |
| Attendant | .. | .. | .. | 300 |
| T. A. | .. | .. | .. | 1,000 |
| Contingencies | .. | .. | .. | 600 |
| Initial equipment | .. | .. | .. | 600 |
| | | | | 4,300 |
| II year—Research Assistant | .. | .. | .. | 2,100 |
| Attendant | .. | .. | .. | 300 |
| T. A. | .. | .. | .. | 1,000 |
| Contingencies | .. | .. | .. | 600 |
| | | | | 4,000 |

| | | | | Rs. |
|-----------------------------|----|----|----|-------------------|
| III year—Research Assistant | .. | .. | .. | 2,400 |
| Attendant | .. | .. | .. | 300 |
| T. A. | .. | .. | .. | 1,000 |
| Contingencies | .. | .. | .. | 600 |
| | | | | <hr/> 4,300 <hr/> |

3. It is understood that the Agriculture Department would provide the necessary facilities for carrying out field work.

4. It is understood that the apparatus, etc., in the University and Government College laboratories would be at the disposal of Dr. Chaudhuri in connection with this work.

SHIV NARAIN KASHYAP,
(Convener).

LAHORE,
The 3rd May 1930.

APPENDIX XX.**ESTABLISHMENT OF A RESEARCH STATION AT SHILLONG FOR THE DEVELOPMENT OF BEE-KEEPING IN INDIA.**

Attention is invited to the letter (copy attached) from the Director, Imperial Institute of Agricultural Research, Pusa, No. 5372, dated the 14th August, 1930, regarding the establishment of a research station at Shillong for the development of Bee-keeping in India. The scheme, which is for 3 years in the first instance and is fully explained in the application forwarded by the Director, Pusa, involves an expenditure of Rs. 7,100 non-recurring and Rs. 90,000 recurring over a period of three years (Total Rs. 97,100).

M. S. A. HYDARI,
Secretary.

30th September 1930.

LETTER FROM DR. W. H. HARRISON, D.Sc., OFFICIATING DIRECTOR, IMPERIAL INSTITUTE OF AGRICULTURAL RESEARCH, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, No. 5372, DATED PUSA, THE 14TH AUGUST 1930.

SUBJECT :—*Scheme for the development of Bee-keeping in India.*

As directed by the Government of India in their Education, Health and Lands Department letter No. 1589-Agri., dated 31st July 1930 (copy enclosed for ready reference), I have the honour to forward herewith a scheme drawn up by Mr. T. Bainbrigge Fletcher, Imperial Entomologist, Imperial Institute of Agricultural Research, Pusa, for the development of bee-keeping in India by the establishment of a research station at Shillong and to request that the sanction of the Imperial Council of Agricultural Research may kindly be obtained to the allotment of a grant to finance the scheme.

LETTER FROM MR. M. I. RAHIM, I.C.S., UNDER SECRETARY TO THE GOVERNMENT OF INDIA, DEPARTMENT OF EDUCATION, HEALTH AND LANDS, TO THE DIRECTOR, IMPERIAL INSTITUTE OF AGRICULTURAL RESEARCH, PUSA, No. 1589-AGRI., DATED SIMLA, THE 31ST JULY 1930.

SUBJECT :—*Scheme for the development of Bee-keeping in India.*

With reference to your letter No. 2780, dated the 26th April 1930, I am directed to say that the Government of India approve of the scheme drawn up by Mr. Bainbrigge Fletcher, Imperial Entomologist, for the development of bee-keeping in India by the establishment of a station at Shillong, and to request that in accordance with the prescribed procedure the scheme may be submitted officially to the Imperial Council of Agricultural Research with an application for a grant to finance it.

SCHEME FOR THE DEVELOPMENT OF BEE-KEEPING IN INDIA.

There is a practically unlimited demand for Honey in India, where Honey-bees occur wild almost everywhere ; yet the supply of honey is nowhere in excess of the demand which is largely met, in the case of towns at any rate by imports from Australia, America and Europe. There seems to be no reason why India should not supply a considerable proportion of her own requirements in this line and make a valuable addition to the diet of the people.

2. Three species of wild Honey-bees occur commonly, practically throughout India. The Rock-Bee (*Apis dorsata*) is a large Bee which builds a large single comb on rocks and tall trees, often in regular colonies ; it is fierce and intractable and its habits of building a single exposed comb and of seasonal migration make it unsuitable for domestication. The Little Bee (*Apis florea*) also makes a small single exposed comb, usually in a bush, and its habits and small production also render it unsuitable for domestication. The Indian Bee (*Apis indica*) makes several parallel combs which are, under natural conditions, placed in a hollow tree ; this habit makes it suitable for domestication, which is carried out in some parts of India ; chiefly in the Hills. The chief defect of the Indian Bee is its small production of honey, due to the fact that in the plains it is active throughout the whole year and has therefore not found it necessary to lay up large stores to tide it over the winter. At Pusa we have found that an average honey production per colony of the Indian Bee is about 6 lbs. wt. In the Hills of Northern India, where there is a more pronounced winter, the honey-storage is larger and may be put at 30-40 lbs. wt. But even these latter figures are small in comparison with those of the European Honey-bee and, if a Bee of larger storage-capacity could be used, there seems to be no reason why much better results should not be obtainable in India.

3. We have already experimented at Pusa with European Bees (*Apis mellifera*) which gave good results as long as the imported queens lived, but we found it impossible to carry them on at Pusa, mainly because all the young queens which were reared were killed off by predaceous enemies.

4. I consider that there is very considerable demand in India for putting Apiculture on a proper footing. My correspondence includes constant requests from all over India and Burma for information about Bee-keeping, and there is ample scope for a whole-time Apiculturist to advise and help Indian Bee-keepers in regard to improved methods of Apiculture and in particular to supply colonies, Hives and apparatus, the want of these being at present a decided obstacle to advance. Whilst the Hill Districts offer the best chances of success, the Plains also, in most localities, allow of Bee-keeping on a small scale. Our difficulties at Pusa were mainly in connection with the breeding of imported Bees; there is no difficulty in keeping the local bee (*Apis indica*) on a small scale. Few places offer facilities for Bee-keeping as a whole-time source of income, but there are few which will not allow of Bee-keeping on a small scale as a subsidiary source of income. There is a very large production of honey (and wax) in India but the production at present cannot meet the demand mostly because of the crude methods of collection of honey, and also because the production of the local bees is small. Experimental work in a suitable locality by a whole-time Bee Expert is therefore necessary to determine whether we can get a better-yielding type of bee in India and also to improve local methods of Bee-keeping. Such experiments should deal with:—

- (1) The manipulation of the Indian Bee, including hive-design and trials with various local races,
- (2) experiments with imported bees, especially Italian and Egyptian races,
- (3) attempts to cross Indian and imported Bees to endeavour to secure a strain of higher honey-yielding capacity.

These experiments, if successful, will be of general benefit to India.

5. To do this, we require the services of a whole-time Bee Expert, thoroughly familiar with the art of Bee-keeping and with the characteristics of the different races of Honey-bees, and specially with practical experience of the technique of artificial crossing of Bees. Such an expert cannot be secured in India nor will it be an easy matter to secure the right type of man from outside. Inquiries from (1) the British Bee-keepers' Association, England, (2) the Apicultural Section of the Bureau of Entomology, Washington, and perhaps also from the Chief Entomologists in South Africa and Austrasia, will have to be made as to the possibility of securing a suitable candidate. I do not think that a suitable man will be willing to come for less than a consolidated pay of Rs. 1,500 per mensem. He will have to be engaged on a short-term agreement.

6. In order to enable the experiments to yield definite results, it is necessary that they should be conducted for at least 5 years, but I think that we should be in a position to close down after 3 years if the results are not promising or to continue for a couple of years longer if required. I consider, therefore, that the Scheme should be conducted for three years to commence with.

7. As regards locality, a place is required which is suitable climatically (not too hot in summer for imported bees and not too cold in winter for Indian Bees from the plains) and with sufficient bee-pasturage and lack of predaceous enemies.

*Since this note was prepared, I have heard from a Mr. Baldry, at Mahabeshwar, who claims to be a Bee-keeping Expert and who is apparently desirous of employment as such.

I have examined the possibilities of Shillong and Dehra Dun with reference to these requirements and find that the former is more suitable than the latter for the following reasons :—

- (1) the bee-pasturage at Dehra Dun seems inferior to that at Shillong and to be already fully occupied—probably overstocked with bees, so that any Agricultural Experiment Station, bringing in a new lot of bees, will have to face severe competition in gathering nectar and pollen. It may be noted here that a strong bee-colony will consist of roughly 20,000 worker-bees, which number may be raised to 50,000 during a good period of honeyflow, so that an apiary of even ten or twenty hives will require several millions of flower daily. The local flora of Shillong is unusually rich and should support an experimental apiary without difficulty. The local flower and fruit gardens and the numerous wild flowers provide rich stores for bees to draw upon. Shillong has also the unique advantage of having at present only one species of honey-bee (*Apis indica*).
- (2) Bee-eaters are certainly present at Dehra Dun, but are apparently absent from Shillong. Amongst enemies of bees, although not strictly predators, are the Wax Moths which lay their eggs in combs, especially of weak colonies, the larvae tunnelling in the wax and in bad cases, leading to the abandonment of the next. Of these Wax Moths, we have two species in India, *Galleria mellonella* and *Meliphora grisella*. Both occur commonly in Dehra Dun. We have no record of either at Shillong, but both are likely to occur, being practically cosmopolitan insects. Neither, however, should be allowed to obtain a footing in a well-kept apiary although they may be serious pests of badly-kept hives and of colonies of Wild Bees.
- (3) There is a local bee-keeping industry at Shillong, but not at Dehra Dun.

8. With regard to subordinate staff, one Assistant on Rs. 200 per mensem will, in my opinion, be sufficient in the beginning. I do not think it necessary to have a Class II Assistant to commence with. If the scheme proves unlikely to yield results the pay of such a man would be wasted. If the scheme is successful and it seems desirable to carry it on, there will be ample time (about the third year) to consider taking on a Class II man if such is required. I doubt whether, in most cases, there is any great advantage in starting a new man in Class II, anyway : I should be inclined to start a new man in the ordinary Assistant Grade with prospect of rapid advancement to Class II if worthy.

9. As regards lands and buildings one or two acres of land and a few temporary sheds will be sufficient to meet the requirements. There is a large fruit garden (about 100 acres) at Shillong belonging to Government and leased to Mr. C. H. Holder. The United States Entomological Bureau had their temporary station for *Papilio* work in this Fruit Garden and I think it would be possible to arrange with Mr. Holder to place the Bee Station there. If not, it could be put just outside the Fruit Garden. In either case the cost for a temporary lease would be nominal as there is ample land available in that direction. The Bee Expert himself would find very suitable quarters at "La Chaumiere" or other house in the vicinity ; this would be a matter for his personal arrangement. I doubt whether a special office would be required and I hope that the Bee-Expert would not be so bothered with correspondence as to require a special clerk. My view is that he is to be engaged on research work and that his time should be given to this.

Owing to the local type of earthquake-proof construction, building is relatively cheap in Shillong, even the largest bungalows being frame-houses built of local wood, the sides covered with reeds and plaster.

10. The enclosed statement gives an estimate of expenditure involved, both recurring and non-recurring. The figures are approximate as it is impossible to give any very exact estimate for a scheme of this kind. The total cost of the scheme is estimated to amount to Rs. 7,100 non-recurring and Rs. 90,000 recurring on the assumption that the experiments will be carried out for a period of three years.

(Sd.) T. BAINBRIGGE FLETCHER,

Imperial Entomologist, Pusa.

17th April 1930.

Enclosure : A statement of expenditure : (Annexure I).

ANNEXURE I.

Estimate for a scheme for the development of Bee-keeping in India.

| Particulars. | Expenditure. | | | |
|--|----------------|---------------|--------------|-------------|
| | Non-recurring. | Recurring. | | |
| | | First Year. | Second Year. | Third Year. |
| | Rs. | Rs. | Rs. | Rs. |
| One Bee Expert on a consolidated pay of Rs. 1,500 per mensem (including Provident Fund, house accommodation or any local allowances) | .. | 18,000 | 18,000 | 18,000 |
| Cost of a return passage plus Railway fares .. | 3,000 | .. | .. | .. |
| One Assistant on Rs. 200 per mensem (inclusive of all allowances) | .. | 2,400 | 2,400 | 2,400 |
| Local Labour—cost of night watchman on Bee sheds and local coolies | .. | 1,200 | 1,200 | 1,200 |
| One or two acres of land, fencing and temporary sheds | 3,000 | .. | .. | .. |
| Importation of Bees (10 colonies at £20 each landed in India) and transportation of same to experiment station | .. | 3,000 | 3,000 | 3,000 |
| Apparatus, such as Hives, smokers, Veils, Foundation combs, Honey extractors, etc. | 600 | 1,900 | 1,900 | 1,900 |
| Travelling allowance | .. | 2,000 | 2,000 | 2,000 |
| Miscellaneous, such as stationery, postage, furniture | 500 | 1,500 | 1,500 | 1,500 |
| | 7,100 | | | |
| Total cost for three years | .. | 90,000 | | |

N.B.—It is not possible to give exact figures in a scheme of this kind. It is possible that there may be savings in expenditure year after year in certain items under Apparatus and that there may be appropriations in aid on account of sale of honey, etc. Under Travelling, on the other hand, the Bee Expert may be required to make extensive tours in the 2nd and subsequent years to see conditions in other districts, so that the expenditure under this item might increase after the first year. It is equally possible that the Bee Expert might require more expenditure under apparatus and miscellaneous and less on imported bees. The approximate figure of Rs. 30,000 per year as recurring expenditure should therefore be about correct for the whole period of the scheme.

APPENDIX XXI.

REVISED SCHEME OF RESEARCH IN FRUIT-GROWING IN THE
MADRAS PRESIDENCY.

Attention is invited to the attached extract from page 33 of the Proceedings of the Advisory Board held at Simla in June 1930 regarding the scheme of research in fruit-growing in the Madras Presidency (Enclosure I) and to pages 154-158* of the Proceedings. The Government of Madras have now submitted a revised scheme (Enclosure II) for the establishment of two fruit research stations, one on the plains and the other on the Nilgiris. The plains station involves a non-recurring expenditure of Rs. 39,256 and an annual recurring expenditure of Rs. 9,184, while the station on the Nilgiris involves a total expenditure of Rs. 72,200 (recurring and non-recurring) over five years. It may be noted that the original scheme involved a total expenditure of Rs. 71,200 for a period of 5 years (including a capital outlay of Rs. 38,000 on buildings, lands, etc.) as against the total expenditure of Rs. 1,57,376 now proposed on two stations. The revised scheme is for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

The 6th December 1930.

*Not printed.

ENCLOSURE I.

Extract from the Proceedings of the meeting of the Advisory Board of the Imperial Council of Agricultural Research, held at Simla on the 9th, 10th, 11th and 12th June 1930.

15. *Scheme of research in fruit-growing in the Madras Presidency.*—In introducing the scheme, Mr. Hilson stated that they in Madras could go no further in the matter of fruit research without financial help. They had already four fruit stations in Madras, namely, Samalkota, Kallar, Burliar and Coonoor. They were also trying to encourage trade in fruits from the Nilgiris to the plains. Mr. Mitra proposed that the scheme should be deferred till interested provinces, for example, his own (Assam), had themselves put up schemes of fruit research which the Council would consider together. Mr. Milne supported Mr. Mitra. Mr. Burt was also in favour of postponement. He thought that the Council should consider the question of the steps which should be taken to promote fruit-growing in India as a whole. In the interval he wanted the Madras Government (1) to give an assurance that they proposed to relieve Mr. Butcher, who was stated to be in charge of the experiment, of other work as he considered that the experimental work of the farm would require his whole attention, and (2) to cut out from the scheme those items which were not essential to the experimental programme but *designed* to expand the propagation of fruit trees for distribution. Mr. Hilson, in reply, said that he did not see why the Madras scheme should be deferred because other provinces had been late in putting up their own. He was willing to give the assurance required by Mr. Burt; in regard to his second point, if any cuts were required to enable the Council to finance only that portion of the scheme which was definitely experimental, these could be made at the present meeting.

In the result, however, the Board by vote agreed that consideration of the scheme should be postponed till its next meeting; that in the interval the Madras Government's attention might be drawn to the two points raised by Mr. Burt. This interval would also enable other provinces, if they felt so inclined, to submit their own fruit schemes so that the problem could be discussed as a whole as had been done in the case of rice.

ENCLOSURE II.

Copy of a letter No. 3273-III|30-1, dated Fort St. George, the 5th November 1930, from S. V. Ramamurty, Esq., I.C.S., Secretary to the Government of Madras, to the Secretary, Imperial Council of Agricultural Research, Delhi.

In continuation of my letter No. 356-III|30-3, dated the 6th May 1930, asking for a grant of Rs. 71,200 for research in fruit-growing in this Province, I am directed to state that the Director of Agriculture of this Province has since submitted proposals for the establishment of two Research stations, one on the plains and the other on the Nilgiris. A statement showing the approximate expenditure that will have to be incurred on the station during the next five years is appended. It will be seen therefrom that the station on the plains involves a non-recurring expenditure of Rs. 39,256 and an annual recurring expenditure of Rs. 9,184, while the station on the hills involves a total expenditure of Rs. 72,000 (recurring and non-recurring) during the next five years.

As stated in my last letter referred to above, the scheme is of all-India importance and will be of use to other Provinces also. Owing to the present financial conditions, this Government is not in a position to provide for any recurring or non-recurring expenditure and so I am directed to inquire whether the Council will provide for the whole expenditure and if not, what portion the Council will be willing to provide.

Fruit Research Station—Plains.

A.—NON-RECURRING.

| | Rs. |
|--|--------|
| Capital outlay— | |
| 1. Land—30 acres at Rs. 800 each including 15 per cent. compensation | 24,000 |
| 2. Buildings— | |
| (i) Office and Store | 2,500 |
| (ii) Implement and cart shed | 656 |
| (iii) Cattle shed (for 2 pairs) | 500 |
| (iv) Farm Manager's quarters | 3,500 |
| (v) Store clerk's quarters | 1,200 |
| (vi) Coolies' sheds | 600 |
| (vii) Potting and grafting shed | 900 |
| (viii) Shed for oil engine | 1,000 |
| 3. Two pairs of cattle at Rs. 300 per pair | 600 |
| 4. Dead stock— | |
| (i) Pump and oil engine | 1,200 |
| (ii) Pipes, masonry channels and laying of the land for irrigation | 1,000 |
| (iii) Fencing | 1,000 |
| (iv) Implements and tools, etc. | 600 |
| Total | 39,256 |

B.—RECURRING.

| | Rs. |
|--|--------|
| 1. Pay of Establishment— | |
| 1 Superintendent at Rs. 250 × 12 | 3,000 |
| 1 Assistant at Rs. 100 per mensem × 12 | 1,200 |
| 1 Clerk at Rs. 35 × 12 | 420 |
| 1 Peon at Rs. 12 × 12 | 144 |
| 1 Fieldman at Rs. 35 × 12 | 420 |
| 2. Working expenses | 3,000 |
| 3. Contingencies | 1,000 |
| Total | 9,184 |
| Total Non-recurring | 30,256 |
| Total Recurring | 9,184 |

Fruit Research Station—Hills.

I. YEAR.

| | Rs. | Recurring. | Non-recurring |
|--|-------|------------|---------------|
| | | Rs. | Rs. |
| Pay of Establishment— | | | |
| 1 Upper Subordinate, 85—5—120, average pay | 107 | | |
| 1 Fieldman, Rs. 35—50 | 44 | | |
| 1 Clerk Rs. 35—50 | 48 | | |
| 1 Peon Rs. 12—18 | 15½ | | |
| | 214½ | 2,574 | or 2,600 |
| Contingencies—Miscellaneous— | | | |
| Furniture, postage stamps, etc. | 500 | 500 | |
| Allowance—Voted— | | | |
| Other compensatory (hill allowance)— | | | |
| 1 Upper Subordinate | 25 | | |
| 1 Fieldman | 10 | | |
| 1 Clerk | 10 | | |
| 1 Peon | 2 | | |
| | 50 | 600 | |
| Capital Outlay— | | | |
| Cost of land— | | | |
| 20 acres at Rs. 200 an acre | 4,000 | | |
| Clearing 5 acres | 1,000 | | |
| Purchasing fruit trees | 1,500 | | |
| Fitting and planting the above | 500 | | |
| | 7,000 | | 7,000 |

Fruit Research Station—Hills—contd.

| | Recurring. Non-recurring. | | |
|--|---------------------------|--------------|---------------|
| | Rs. | Rs. | Rs. |
| Nursery— | | | |
| Clearing 1 acre | 200 | | |
| Terracing and revetting | 300 | | |
| | <u>500</u> | | 500 |
| Buildings— | | | |
| Quarters for Upper Subordinate | 3,000 | | |
| Quarters for fieldman | 2,500 | | |
| Quarters for clerk | 2,500 | | |
| Rest-house | 5,000 | | |
| Office, tool and fruit store | 3,500 | | |
| Drains, revetments, etc. | 1,000 | | |
| Fencing | 3,000 | | |
| | <u>20,500</u> | | 20,500 |
| Purchase of deadstock (tools and implements) | | | 500 |
| Working expenses— | | | |
| Manures and chemicals | 1,000 | | |
| Cooly labour and sundries | 1,000 | | |
| | | <u>2,000</u> | |
| Total I year | | <u>5,700</u> | <u>28,500</u> |
| | | | <u>34,200</u> |

II. YEAR.

| | | | |
|--|--------------|--------------|---------------|
| Pay of Establishment | 2,600 | 2,600 | |
| Contingencies—Miscellaneous | 200 | 200 | |
| Allowances—Voted—Other compensatory | 600 | 600 | |
| Capital Outlay— | | | |
| Cost of land— | | | |
| Clearing 5 acres of land | 1,000 | | |
| Constructing drains, revetments | 1,000 | | |
| Purchase of fruit trees from Australia | 1,500 | | |
| Pitting and planting | 500 | | |
| | <u>4,000</u> | | 4,000 |
| Purchase of deadstock— | | | |
| Tools and implements | 200 | | 200 |
| Working expenses— | | | |
| Manures and chemicals | 1,000 | | |
| Cooly labour and sundries | 2,600 | 3,600 | |
| Total II year | | <u>7,000</u> | <u>4,200</u> |
| | | | <u>11,200</u> |

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Fruit Research Station—Hills—contd.

| | Rs. | Recurring. Rs. | Non-recurring. Rs. |
|---|-------|-------------------|-----------------------|
| III. YEAR. | | | |
| Pay of Establishment | .. | 2,600 | .. |
| Contingencies | .. | 100 | .. |
| Allowances | .. | 600 | .. |
| Capital outlay— | | | |
| Cost of land (opening and planting 5 acres).. | .. | .. | 5,000 |
| Purchase of deadstock— | | | |
| Tools and implements | .. | .. | 150 |
| Working expenses— | | | |
| Cooly labour and sundries | .. | 3,600 | .. |
| Total III year | .. | 6,900 | 5,150 |
| | | 12,050 | |
| IV. YEAR. | | | |
| Pay of Establishment | .. | 2,600 | .. |
| Contingencies | .. | 100 | .. |
| Allowances | .. | 600 | .. |
| Capital outlay— | | | |
| Cost of deadstock— | | | |
| Tools and implements | 100 | .. | 100 |
| Working expenses— | | | |
| Cooly labour and sundries | 4,000 | 4,000 | .. |
| Total IV year | .. | 7,300 | 100 |
| | | 7,400 | |
| V. YEAR. | | | |
| Pay of Establishment | .. | 2,600 | .. |
| Contingencies | .. | 50 | .. |
| Allowances | .. | 600 | .. |
| Capital outlay— | | | |
| Purchase of deadstock— | | | |
| Tools and implements | 100 | .. | 100 |
| Working expenses— | | | |
| Cooly labour and sundries | 4,000 | 4,000 | .. |
| Total V year | .. | 7,250 | 100 |
| | | 7,350 | |

Abstract.

| | Pay of establish- ment. | Con- tingen- cies. | Allowances. | Capital outlay. | Working Ex- penses. | Total. |
|----------------|-------------------------------|--------------------------|-------------|--------------------|---------------------------|--------|
| | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| I year | 2,600 | 500 | 600 | 28,500 | 2,000 | 34,200 |
| II year | 2,600 | 200 | 600 | 4,200 | 3,600 | 11,200 |
| III year | 2,600 | 100 | 600 | 5,150 | 3,600 | 12,050 |
| IV year | 2,600 | 100 | 600 | 100 | *4,000 | 7,400 |
| V year | 2,600 | 50 | 600 | 100 | 4,000 | 7,350 |
| | | | | | | 72,200 |

APPENDIX XXII.

COPY OF LETTER FROM THE SECRETARY TO THE GOVERNMENT OF ASSAM IN THE TRANSFERRED DEPARTMENTS, AGRICULTURE BRANCH, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, NEW DELHI, No. 3342-E., DATED SHILLONG, THE 10TH DECEMBER 1930.

I am directed by the Government of Assam to forward a note by the Officiating Director of Agriculture, Assam, outlining a scheme for investigating the possibilities of fruit culture in this province on an organised basis, and to request that it may be laid before the Advisory Board so that it may be presented to the next session of the Governing Body with this Government's request for financial aid. As the Council are aware, the resources of the province are lamentably insufficient even for work upon the staple crops, and it is impossible to allot more than trivial amounts for the purpose of experiment in promising new fields such as this of fruit culture. The Assam Government, therefore, trust that the Council may find it possible to contribute the whole recurring and non-recurring cost of the venture, especially in view of the natural suitability of the province for expansion of fruit-growing, and also of the fact that the demands made by them upon the Council's resources have been limited by strict scrutiny of the proposals made by their Agricultural Department. The nature and scope of the scheme are fully detailed in the accompanying note.

A SCHEME FOR EXPERIMENT ON FRUIT CULTURE IN ASSAM.

1. With the large area covered by hill districts and the varying climatic and soil conditions, the possibilities of fruit growing in Assam are very large. Out of a total provincial area of 35,299,970 acres the hills comprise 13,950,080 acres, of which 11,120,826 acres are reported to be arable and only 909,652, acres are under actual cultivation. A considerable portion of the arable area in the hills could be planted profitably with fruit plants. The importance of Assam for fruits has been stressed in paragraph 515 of the report of the Royal Agricultural Commission. Most of the plains abound in "Tillas" or small hillocks, which, though not very suitable for ordinary crops, may be profitably planted with fruit trees. In the plains the cultivation of fruits, wherever possible, is likely to prove a much more paying proposition in Assam, with its labour difficulties, than many of the ordinary crops, particularly for educated farmers. The actual area under fruits, roots and vegetable is, however, reported to be only 545,293 acres, of which perhaps less than half is under fruit.

2. *Citrus fruits*.—The orange is *par excellence* the most important commercial fruit in Assam. Oranges from Assam not only supply the markets of Bengal, including Calcutta, but even find their way up to Akyab in the east, Madras in the south and Benares in the west. The fruit is grown extensively on the slopes of the Khasi Hills and is extending throughout the plains of the whole province—the present acreage being estimated as about 11,000. With proper methods of cultivation, picking and marketing, the Assam orange should find a ready market throughout India, Burma and perhaps even in Europe. Recent figures of export are not available, but the figures from 1904-05 to 1921-22 indicate an annual export varying from 29,837 maunds valued at Rs. 2,38,696 to 104,714 mds. valued at Rs. 5,44,514 through Chhatak in Sylhet, through which place most of the oranges of the Khasi and Jaintia Hills pass for export by boat. The export through other channels must be at least another 25 per cent. of this figure. Most of these oranges find their way to Bengal and other provinces, which shows the interest of other provinces in the problem of improvement of the crop. There are various problems in connection with its cultivation which require investigation.

The most serious factor limiting the cultivation of oranges in Assam is the yellowing or "die-back" of the trees, the cause of which requires further investigation. Enquiries show that this is acting as a serious deterrent to the expansion of cultivation. The most important line of investigation, however, will be the trial of suitable stocks for budding. Budding is a simple method for propagating a large number of trees in a short time, and, in the case of oranges, the budded trees may be expected to come to fruit in three years whereas a seedling would take about seven years or more. This presents an opportunity of getting a hardy root, while budded trees produce more uniform fruits and a better shaped tree than seedlings. Experiments are being made on this line at Haflong and Khanapara (Gauhati) fruit gardens but the work is restricted by limited resources. The areas both at Haflong and Khanapara require enlargement and a much larger number of plants have to be budded than the department has been able to deal with hitherto. Varieties from other provinces should also be tried. The types grown in the different parts of the province vary somewhat in quality. The most promising types should be tested and suitable selections made for different localities.

There is a large demand already for orange seedlings and grafts from within and beyond the province, which cannot be supplied. Properly developed, these two stations will be able to supply all the requirements. Grape fruits are rapidly coming into considerable importance and there are large possibilities of extension in Assam, the soils of which are suitable for most citrus fruits. "Pomellos" are already largely grown. During the last year some budded grape fruit plants were obtained from Florida and planted at Jorhat and Haflong. Some of these have come into fruit this year and a few more plants have been indentured for. Budding has also been started. It is, however, necessary to carry out systematic experiments on a more extensive scale.

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In paragraph 515 of their report the Royal Commission have mentioned the transport difficulties of fruit growers in Assam. This is indeed a serious difficulty but a preliminary enquiry is necessary so that remedies may be suggested to achieve substantial results. It has not been possible to ascertain the loss caused by present methods of picking, packing and marketing of oranges but this is known to be considerable. Not only is there loss in quantity during transit, but defective methods of picking and packing are undoubtedly responsible for a considerable deterioration in value. Oranges are transported from Assam by country boats, steamers and railways. To enable the growers to get the maximum value it is necessary to make careful enquiries as to the destination of the fruit and the cheapest and quickest methods of transport. A marketing officer has, therefore, been provided in the scheme. He will make enquiries as to how the oranges are sold, their ultimate destination, methods of transport, and loss during transit, and will suggest remedies. It is very probable that action on co-operative lines will considerably reduce the losses, but for such a purpose a special trained officer is needed.

3. *Deciduous Fruits*.—The experiments on the deciduous fruits have been carried out mainly at the La Chaumiere Garden, Shillong, since 1912. It has been shown that certain varieties of apples, pears, peaches and plums can be grown successfully, and grafts have been supplied throughout the province. During the last ten years over 1,500 grafts are reported to have been supplied from the La Chaumiere Garden to various places including Barisal in Bengal and Ranchi.

4. There is now little doubt that with the selection of suitable varieties, pears, peaches, plums and certain varieties of apples can be grown in all the Khasi and Jantia Hills, and fruit-growing can be developed as a very profitable business. It is also clear that in many parts of the hill areas deciduous fruits can be successfully grown but it is now desirable to discover which varieties are most suitable for particular areas. Experiments on a limited scale have been carried out by various persons. These have, however, not been carried out systematically or under scientific control. It is necessary to extend the experiments and keep accurate records, so that the varieties best suited to each locality may be selected.

The principal experiments to be carried out may be summarised as follows :—

1. Trial of various indigenous stocks for grafting and budding.
2. Trial of different varieties under different conditions.
3. Selection and propagation of a few definite commercial varieties and their extensive distribution.
4. Trial of various manures and fertilisers.

Incidentally experiments will also be conducted on the following lines :—

1. Control of the "woolly aphid" (*aphis lanigera*) as well as of other diseases of deciduous fruits.
2. Trial of various methods of pruning.
3. Commercial management of orchards.
4. Encouragement of private commercial orchards wherever possible, especially by supplying suitable grafts.
5. Introduction of better methods of picking, packing and marketing.

5. A good deal of work along each of these lines for deciduous fruits has already been done by the late Mr. C. H. Holder as the lessee of the Government Garden at Shillong. A large number of grafts were obtained from abroad and many of them have been successfully grown. A number of imported and indigenous stocks have been tried, but the experiments have not yet been exhaustive or

reduced to scientific form. Assam with its wealth of jungles affords a particularly fruitful field for experiments with indigenous stocks, which require further investigation.

6. It is, therefore, proposed that the experiments on deciduous fruits should be carried out at and from the La Chaumiere Garden and that on citrus fruits at the Khanapara Farm at Gauhati and the Baktiar Farm at Haflong, both of which require extension for the purpose.

7. Details about these stations are given below :—

La Chaumiere Garden.—This is believed to be one of the best gardens for deciduous fruits on this side of India. It contains an arable area of 30 acres of which 22.66 acres are under fruit trees. There are now about 6,000 fruit trees in the garden, consisting of 3,171 apples, 775 pears, 362 plums, 321 peaches and the balance of miscellaneous trees mostly in bearing condition. A large number of the trees, however, require replacement and attention. There are also a large number of grafts. The garden was started in 1912, and was under the management of Government until 1921, when it was leased out to the late Mr. Holder, previously the manager on behalf of Government, who died in August 1930. If the present scheme is accepted all experiments on deciduous fruits will be carried out at this station, which will also form the nursery for supplying grafts of these trees for the whole province and perhaps beyond. With proper development, it is confidently expected that at least 1,000 grafts can be supplied annually from this station. The station will be under the immediate supervision of a Fruit Inspector.

Khanapara, Gauhati.—This station will be used for experiments on citrus fruits and pineapples as outlined above, particularly for the Assam Valley. The present orchard consists of about three acres only and there is no room for expansion except by acquisition of some more land. There is an area of about 5 acres of suitable land contiguous to the present orchard which can be acquired. Budded orange plants will be supplied for the Assam Valley from this station. Five acres should be planted with oranges.

There are at present about 450 orange trees which are expected to come into bearing in 2 or 3 years.

Baktiar, Haflong.—This will be the main station for work on oranges and pineapples for the Surma Valley. There are now about 250 orange trees, most of which are in a bearing condition, and over one thousand seedlings. The work on budding oranges has been carried on since 1925, and some of the budded plants have come into bearing this year. This orchard requires expansion, and plenty of contiguous Government land is available. At present an Overseer is in charge but more expert supervision is required and a Fruit Inspector will be stationed here. Five acres should be planted with oranges.

8. *Staff.*—The experimental work will be at any rate for the present, under the supervision of the Economic Botanist, who had special training in fruit culture in California. The whole of his salary and travelling allowance will be borne by the Local Government. Any laboratory work necessary will be conducted at the departmental laboratory at Jorhat by the existing staff. The headquarters of the present Fruit Inspector should be removed to Shillong. He will be in charge of the work in the Khasi and Jaintia Hills and the Assam Valley. No provision for a residential building is necessary as he can easily live in the town. A Second Fruit Inspector should be appointed for the Surma Valley with headquarters at Baktiar. Quarters will have to be provided, as orchard is about three miles away from the town of Haflong and no private houses are available even in the town. It is impossible for one Fruit Inspector to manage the work of the whole province.

The Fruit Inspectors will not only look after the Government orchards in their respective circles but will also visit private gardens and give advice, for

which there is great demand, as an increasingly large number of educated people are taking to fruit growing. They will also arrange for the supply of fruit trees and grafts. Each will require a peon.

Khanapara, Gauhati.—This will be in charge of an Horticultural Assistant working under the Fruit Inspector, Shillong. As the headquarters of the Fruit Inspector will be in Shillong, it will be necessary to have a superior type of man in charge than an ordinary overseer.

Baktiar, Haflong.—The Fruit Inspector, Surma Valley, will have his headquarters at Haflong and will supervise the work of this station, which will be in immediate charge of an overseer as at present.

A grafter will be required at each of the three stations at Shillong, Gauhati and Haflong. At present there are one Fruit Inspector and one grafter at Khanapara and one overseer at Haflong. They will continue to be paid by the Department as shown in the detailed estimates.

9. If the scheme is accepted there will be a great incentive to fruit-growing, and as the whole of the produce will not be required for consumption within the province, there will be a large surplus for export and canning, in both of which the Empire Marketing Board is interested. The successful working of the scheme will benefit not only this province but consumers of fruits throughout India.

Cost of Scheme.—The total cost for a period of five years will be Rs. 78,656 after deduction of the present provincial expenditure, as shown in the abstract.

Receipts.—It is rather difficult to form an estimate of probable receipts with any degree of accuracy as there are few data to go upon. It is believed that the present receipts from the sale of fruits from La Chaumiere Garden will not be less than between Rs. 2,500 to Rs. 3,500 per annum. The probable receipt from sale of grafts may be estimated at Rs. 500 per annum.

Both at Haflong and Khanapara it is proposed to have about five acres under orange trees. When these come into bearing, the receipts may be estimated at Rs. 2,500 to Rs. 3,500 from each.

If the Council of Agricultural Research provides the extra funds needed the excess receipts over those for the present year will be allowed for on such terms as may be agreed upon between the Council and Government.

J. N. CHAKRAVARTY.

The 25th November 1930.

Abstract of estimates for fruit culture in Assam.

| Particulars. | Non-recurring. | Net recurring for 5 years (after deducting contribution by local Government). | | | | | |
|---|----------------|---|--------------|--------------|--------------|---------------|------------------|
| | 1st year. | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. | Total recurring. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1. Fruit Experiment Station at Haflong | 9,200 | 1,550 | 1,562 | 1,574 | 1,586 | 1,598 | 7,870 |
| 2. Fruit Experiment Station at Khanapara (Gauhati) | 5,000 | 1,420 | 1,492 | 1,564 | 1,636 | 1,708 | 7,820 |
| 3. Fruit Experiment Station at Shillong. | 5,000 | 3,910 | 3,922 | 3,982 | 3,994 | 4,054 | 19,862 |
| 4. Appointment of one Fruit Inspector in the Surma Valley with headquarters at Haflong. | 5,300 | 2,280 | 2,580 | 2,700 | 2,712 | 2,832 | 13,104 |
| 5. Appointment of one Marketing Enquiry Officer for one year. | .. | 5,500 | .. | .. | .. | .. | 5,500 |
| Total .. | 24,500 | 14,660 | 9,556 | 9,820 | 9,928 | 10,192 | 54,156 |

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Estimate for the Fruit Experimental Station at Haflong.

| Details. | 1st year. | | 2nd year. | 3rd year. | 4th year. | 5th year. | Ultimate annual. |
|---|----------------|------------|------------|------------|------------|------------|------------------|
| | Non-recurring. | Recurring. | Recurring. | Recurring. | Recurring. | Recurring. | Recurring. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| ESTABLISHMENT. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| One Overseer (Rs. 30—42—50). | .. | 360 | 360 | 408 | 408 | 456 | 492 |
| One grafter mali (Rs. 25—1—40). | .. | 300 | 312 | 324 | 336 | 348 | 384 |
| Allowance, etc.— | | | | | | | |
| Travelling allowance .. | .. | 50 | 50 | 50 | 50 | 50 | 50 |
| Water supply .. | 2,000 | .. | .. | .. | .. | .. | .. |
| Reclamation .. | 500 | .. | .. | .. | .. | .. | .. |
| Godown .. | 2,500 | .. | .. | .. | .. | .. | .. |
| Overseer's quarters .. | 1,200 | .. | .. | .. | .. | .. | .. |
| Labourers' shed .. | 500 | .. | .. | .. | .. | .. | .. |
| Quarters for grafter mali | 1,200 | .. | .. | .. | .. | .. | .. |
| Fencing .. | 1,000 | .. | .. | .. | .. | .. | .. |
| Furniture .. | 100 | .. | .. | .. | .. | .. | .. |
| Implements .. | 200 | .. | .. | .. | .. | .. | .. |
| Seeds, plants and manures | .. | 400 | 400 | 400 | 400 | 400 | 400 |
| Wages of labourers .. | .. | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Miscellaneous contingencies— | | | | | | | |
| Stamps, office expenses, etc., including one garden mali. | .. | 500 | 500 | 500 | 500 | 500 | 500 |
| Petty repairs .. | .. | 300 | 300 | 300 | 300 | 300 | 300 |
| Total .. | 9,200 | 2,910 | 2,922 | 2,982 | 2,994 | 3,054 | 3,126 |
| Deduct—Expenditure to be met from Provincial grant— | | | | | | | |
| One overseer .. | .. | 360 | 360 | 408 | 408 | 456 | 492 |
| Contingencies including menial. | .. | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Total deduction .. | .. | 1,360 | 1,360 | 1,408 | 1,408 | 1,456 | 1,492 |
| Net estimate .. | 9,200 | 1,550 | 1,562 | 1,574 | 1,586 | 1,598 | 1,634 |

| | | | | | | |
|--------------------------|----|----|----|----|----|-----------|
| Net non-recurring .. | .. | .. | .. | .. | .. | Rs. 9,200 |
| Recurring for 5 years .. | .. | .. | .. | .. | .. | 7,870 |
| Grand total .. | .. | .. | .. | .. | .. | 17,070 |

Estimate for Fruit Experimental Station at Khanapara, Gauhati.

| Details. | 1st year. | | 2nd year. | 3rd year. | 4th year. | 5th year. | Ultimate annual. |
|---|----------------|--------------|--------------|--------------|--------------|---------------|------------------|
| | Non-recurring. | Recurring. | Recurring. | Recurring. | Recurring. | Recurring. | Recurring. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| ESTABLISHMENT. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1 Horticultural Assistant (Rs. 60—8—120). | .. | 720 | 792 | 864 | 936 | 1,008 | 1,128 |
| 1 Graftor mali (Rs. 25—1—40). | .. | 300 | 312 | 324 | 336 | 348 | 364 |
| Quarters for Horticultural Assistant. | 2,500 | .. | .. | .. | .. | .. | .. |
| Quarters for grafter mali .. | 1,200 | .. | .. | .. | .. | .. | .. |
| Acquisition of land (5 acres) | 500 | .. | .. | .. | .. | .. | .. |
| Reclamation and fencing | 500 | .. | .. | .. | .. | .. | .. |
| Implements | 200 | .. | .. | .. | .. | .. | .. |
| Furniture | 100 | .. | .. | .. | .. | .. | .. |
| Seeds, plants and manures | .. | 200 | 200 | 200 | 200 | 200 | 200 |
| Wages of labourers .. | .. | 600 | 600 | 600 | 600 | 600 | 600 |
| Miscellaneous contingencies | .. | 100 | 100 | 100 | 100 | 100 | 100 |
| Petty repairs | .. | 100 | 100 | 100 | 100 | 100 | .. |
| Total .. | 5,000 | 2,020 | 2,104 | 2,188 | 2,272 | 2,356 | 2,512 |
| <i>Deduct—Expenditure to be met from Provincial grant—1 Graftor mali.</i> | .. | 300 | 312 | 324 | 336 | 348 | 334 |
| Contingencies | .. | 300 | 300 | 300 | 300 | 300 | 300 |
| Total Deduction .. | .. | 600 | 612 | 624 | 636 | 648 | 664 |
| Net estimate .. | 5,000 | 1,420 | 1,492 | 1,564 | 1,636 | 1,708 | 1,828 |
| Total non-recurring .. | .. | .. | .. | .. | .. | Rs. 5,000 | .. |
| Total recurring for 5 years .. | .. | .. | .. | .. | .. | Rs. 7,820 | .. |
| Grand total .. | .. | .. | .. | .. | .. | 12,820 | .. |

Estimate for the Fruit Experimental Station at Shillong.

| Details. | 1st year. | | 2nd year. | 3rd year. | 4th year. | 5th year. | Ultimate annual. |
|--|----------------|--------------|--------------|--------------|--------------|--------------|------------------|
| | Non-recurring. | Recurring. | Recurring. | Recurring. | Recurring. | Recurring. | Recurring. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| ESTABLISHMENT. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. | Rs. |
| 1 Overseer (Rs. 30—4/2—50). | .. | 360 | 360 | 408 | 408 | 456 | 492 |
| 1 Grafter mali (Rs. 25—1—40). | .. | 300 | 312 | 324 | 336 | 348 | 384 |
| Allowance, etc.— | | | | | | | |
| Travelling allowance of establishment. | .. | 50 | 50 | 50 | 50 | 50 | 50 |
| Quarters for 1 Overseer .. | 1,200 | .. | .. | .. | .. | .. | .. |
| Quarters for 1 grafter mali .. | 1,200 | .. | .. | .. | .. | .. | .. |
| Godown .. | 1,000 | .. | .. | .. | .. | .. | .. |
| Labourers' shed .. | 500 | .. | .. | .. | .. | .. | .. |
| Reclamation and fencing .. | 800 | .. | .. | .. | .. | .. | .. |
| Implements .. | 200 | .. | .. | .. | .. | .. | .. |
| Furniture .. | 100 | .. | .. | .. | .. | .. | .. |
| Seeds, plants and manures .. | .. | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| Wages of labourers .. | .. | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 | 1,500 |
| Miscellaneous contingencies— | | | | | | | |
| Stamps, office expenses, etc. | .. | 500 | 500 | 500 | 500 | 500 | 500 |
| Petty repairs .. | .. | 200 | 200 | 200 | 200 | 200 | 200 |
| Total .. | 5,000 | 3,910 | 3,922 | 3,982 | 3,994 | 4,054 | 4,128 |

| | |
|---|------------|
| Total Non-recurring | Rs. 5,000 |
| Total recurring expenditure for 5 years | Rs. 19,862 |
| • Grand total | Rs. 24,862 |

Estimate for the appointment of one Marketing Enquiry Officer for one year.

| Details. | Amount. |
|---------------------------------------|--------------|
| | Rs. |
| Pay at Rs. 250 per mensem | 3,000 |
| Travelling allowance | 2,000 |
| One peon at Rs. 11 per mensem | 132 |
| Contingencies | 368 |
| Total | 5,500 |

APPENDIX XXIII.

APPLICATION FROM DR. A. E. SLATER, MISSION POULTRY FARM,
ETAH, FOR A GRANT FOR 5 YEARS FOR BREEDING EXPERIMENTS
IN CONNECTION WITH THE IMPROVEMENT OF GOATS.

The enclosed application (Enclosure I) from Dr. A. E. Slater for a grant of Rs. 5,000 per annum recurring and Rs. 15,000 non-recurring or a total of Rs. 40,000 spread over a period of five years is submitted for the consideration of the Advisory Board. The Government of the United Provinces have been asked to indicate what, if any, portion of the cost of the scheme they are prepared to meet from provincial revenues. Their reply is enclosed. (Enclosure II).

M. S. A. HYDARI,
Secretary.

The 10th December 1930.

ENCLOSURE I.

AN APPLICATION FROM DR. A. E. SLATER TO THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH FOR SANCTION OF A GRANT OF RS. 40,000 (RS. 15,000 NON-RECURRING AND RS. 25,000 RECURRING SPREAD OVER FIVE YEARS) FOR THE REVISED SCHEME OF THE IMPROVEMENT OF GOATS IN THE UNITED PROVINCES.

INTRODUCTION.

IN accordance with the request by the United Provinces Research Committee, I approached a number of experts in animal genetics, and asked for an expression of their views in order to enable me to draw up a more comprehensive scheme than the one first submitted (*vide* letter No. R. E. 14/30 from Philip B. Richards, Esq., A.R.C.S., F.E.S., Secretary, United Provinces Agricultural Research Committee), copy of letter herewith enclosed.

Further, in accordance with a letter No. 198-E/D.O., dated August 28, from G. Clarke, Esq., C.I.E., Director of Agriculture, United Provinces, I secured personal interviews with C. H. Parr, Esq., Deputy Director of Cattle Breeding, Muttra, United Provinces, and Colonel Olver, C.B., C.M.G., F.R.C.V.S., Animal Husbandry Expert, Imperial Council of Agricultural Research, Simla, to discuss the matter with these experts, and work out technical details. I am glad to be able to report that both these gentlemen approved of my scheme, and gave me most valuable assistance in drawing up a comprehensive revised scheme. The following experts also expressed their views by letter :-

Colonel J. Matson, O.B.E., I.A., Director of Southern Circle, Jubbulpur ; Captain S. G. M. Hickey, Civil Veterinary Department, Lucknow ; both heartily supported my scheme. Replies are expected shortly from F. J. Gossip, Esq., Livestock Expert, Government of Bengal, and Professor F. A. E. Crew, Director of Imperial Bureau of Animal Genetics, University of Edinburgh, Scotland.

Lines of research.—My revised scheme calls for three lines of research.

- (a) Experimentation with Swiss Toggenberg goats, to test their suitability for Indian conditions, and to determine whether they will reproduce themselves pure in India, without serious loss of vigour. Should they prove satisfactory, *i.e.*, show themselves to be hardy for village milk production, and at the same time produce greater yields than that obtained by selective breeding from the best indigenous breeds, such as the Jumnapari and Barbari, then the future policy could well consist of producing pure-bred bucks in the country, for grading purposes on village herds. It is *not proposed* to go on importing high-priced bucks continuously.
- (b) Selective breeding of the best Jumnaparis by means of recorded milk yields and produce tests.
- (c) Selective breeding of the best Barbari by means of recorded milk yields and produce tests.

Our purpose then in (b) and (c) would be to endeavour to form *improved pure-bred flocks* of these two breeds by careful and good, but not high feeding, and keeping them pure in separate herds. Grading up we would endeavour to do, by selective breeding for milk yield and prolificacy, under village conditions of maintenance, but with every care to maintain health and condition throughout the year. In this way, by adhering continuously to pure-bred animals of similar type herds, we should in time succeed in building up herds of good milk yielding goats.

Cross-breeding.—Alongside these pure-bred herds we might carry on cross-bred herds, the foundation females of which would be of the same breeds as the two pure-bred herds, so that a fairly reliable comparison of results could be obtained.

By carrying on cross-breeding with these females and their progeny, into the third and fourth generation, and making careful comparisons of milk yields over all costs and prolificacy, in each succeeding generation of pure-breds and cross-breds, we should in time obtain valuable data on which to base a policy for the future.

Continuity.—Continuity is to our minds essential. We believe that breeding on the above lines should be carried on continuously during the whole period of the experiment, and that changes of policy during that time *are not desirable*.

Summary of the object of the experiment.—To observe by careful records kept over a series of consecutive generations, maintained under good village conditions :—

- (1) The comparative results obtained by selective breeding of pure-bred Jumnapari and Barbari goats and pure-bred Toggenbergs.
- (2) The comparative results obtained from—
 - (a) First crosses between pure-bred Toggenbergs and village does.
 - (b) First crosses between bucks of the two selected Indian breeds and village does.
 - (c) Subsequent matings of the $\frac{1}{2}$ and $\frac{3}{4}$ breeds thus obtained with pure-breds.

Records.—Careful records should be kept on the following :—

- (1) Comparative milk production and the food consumed.
- (2) Hardiness and prolificacy.
- (3) Time of reaching maturity and food consumed up to that time.
- (4) Comparative age of commencing milk production in first lactation, and the comparative amount of food consumed, including dry periods per 100 lb. of milk produced.
- (5) Milking longevity, i.e., the average number of profitable lactation per doe.
- (6) The average interval between kiddings.
- (7) The estimated average value of hair, and hide and carcass.

It is at once apparent that a *generous provision* must be provided for adequate trained assistance for such work as that outlined in this revised scheme. Mr. Parr suggested that a B. Sc. in Agriculture, who has specialized in dairying was essential.

Grants-in-aid.—After a long consultation with Mr. C. H. Parr, as to what would be required in the way of buildings, stock and equipment, the following was arrived at :—

| | <i>Non-recurring.</i> |
|--|-----------------------|
| <i>Buildings—</i> | |
| | Rs. |
| Quarters for trained assistant | 2,500 |
| Herdsmen's quarters | 1,000 |
| Dairy building and office | 2,000 |
| <i>Stock—</i> | |
| (a) Toggenbergs—1 male, 10 females, 11 × 300 | 3,300 |
| (b) Jumnaparis—1 male, 29 females, 30 × 25 | 750 |
| (c) Barbaris—2 males, 28 females, 30 × 25 | 750 |

| | | <i>Non-recurring.</i> |
|---|--------------|-----------------------|
| <i>Equipment—</i> | | Rs. |
| Sheds and kidding pens with enclosures for 100 breeding stock and kids | | 2,500 |
| Fencing | | 1,000 |
| Dairy equipment | | 500 |
| Office equipment (including typewriter) | | 600 |
| Weighing scales (for stock) | | 100 |
| | Total | 15,000 |
| | | <i>Recurring.</i> |
| | | Rs. |
| Lease of grazing rights and lease for 5 acres of cultivated land (100 goats at Rs. 10 per head per annum) | | 1,000 |
| <i>Feed and keep—</i> | | |
| Cultivation | | 400 |
| Herdsmen—5 men—1 at Rs. 25, 4 at Rs. 14 | | 972 |
| Farm contingencies | | 500 |
| Office contingencies | | 328 |
| Trained assistant for keeping research records at Rs. 100—5—200 | | 1,800 |
| | Total | 5,000 |

The *least* amount therefore that the plan outlined above can be carried on with is a non-recurring grant of Rs. 15,000 and a recurring grant of Rs. 5,000 per annum for five years, and we would therefore respectfully make application for these amounts.

Conclusion.—The opinion of all those who have expressed their views is that our scheme is a sound one and well worthy of support. It might also be added that no records are available in India on milkgoats, and no research work has been carried on. These points were brought out clearly in the replies to my questions, and the only farm herd of goats maintained by Government in India is we understand at the Cattle Farm at Hissar. The only printed information we could obtain is a bulletin, "The Economic Value of the Goat" by Mr. Williams, Principal, Agricultural College, Lyallpur.

It might be pointed out also that the Lindithgow Commission made certain recommendations on goats in their report, and it is our considered opinion that the problem of the "poor man's cow" in India needs the sympathetic, adequate and continued support of Government.

No. R.E.4/30, dated Cawnpore, July 9, 1930.

From—PHILIP B. RICHARDS, Esq., A.R.C.S., F.E.S., Secretary, United Provinces Agricultural Research Committee, Cawnpore,

To—DR. A. E. SLATER, Mission Poultry Farm, Etah.

With reference to your application through the Director of Agriculture, United Provinces, to the Imperial Council of Agricultural Research for grants in
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connection with your experiments in improving the milk of goats, I have the honour to inform you that the United Provinces Agricultural Research Committee considered your application and that it was approved.

2. The Committee therefore recommended that a non-recurring grant of Rs. 1,350 and a recurring grant of Rs. 1,000 per annum for five years should be asked for from the Imperial Council.

Owing to the number of applications before the Advisory Board of the Imperial Council of Agricultural Research, it was not possible for them to include this recommendation in the agenda of their meeting in June. I presume that it will be placed before the Advisory Board at the next cold weather meeting.

3. The United Provinces Research Committee considered that the question of the milk yield of goats was of vital importance to the poor classes in this province, and instructed me to communicate with you suggesting that you should get into touch with experts in the subject of animal genetics with the object of preparing a more comprehensive scheme for future work.

4. My personal interpretation of the feeling of the United Provinces Agricultural Research Committee is that the scheme as proposed by you will prove to be on too small a scale to solve the problem, but that, before they would be prepared to recommend a sufficient grant to provide for the thorough investigation of the inheritance and improvement of milk yield in goats, they would require to be convinced that the best advice available had been obtained as to the plan of investigation; and that provision was included for trained assistance competent to deal with the genetical aspect of the problem.

5. I trust you will give this matter your consideration and will shortly be able to place before the Committee a scheme for future extension on the lines suggested.

ENCLOSURE II.

LETTER FROM THE DEPUTY SECRETARY TO THE GOVERNMENT OF THE UNITED PROVINCES, AGRICULTURE DEPARTMENT, TO THE SECRETARY TO THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, No. 931-A., DATED THE 13TH DECEMBER 1930.

SUBJECT :—*Application for a grant by Dr. A. E. Slater for research work on goat breeding in the U. P.*

With reference to the correspondence resting with your letter No. 247-Vet., dated November 24th, 1930, on the above subject, I am directed to say that Dr. Slater's scheme has been examined by the Imperial Council's Expert in Animal Husbandry and the Deputy Director in charge of cattle breeding in this province and certain changes have been made at their suggestion. The United Provinces Government consider that the scheme, as passed by the Provincial Agricultural Research Committee is a sound one and, therefore, commend it to the consideration of the Advisory Board of the Council at its next meeting.

2. In accordance with the principles governing grants by the Imperial Council, the expenditure of Rs. 5,500 on buildings and that of Rs. 3,500 on account of sheds, kidding pens and fencing, proposed in the revised scheme, should ordinarily be met by this Government, but in the present state of provincial finances there is little likelihood of their finding this amount for some years to come. If the principle is adhered to literally, this scheme of all-India importance will have to be held up. This Government, therefore, recommend that this may be treated as a special case and the entire expenditure, initial and recurring for a period of five years, be met by the Imperial Council.

APPENDIX XXIV.

PRODUCTION OF AGRICULTURAL CINEMA FILMS.

At its meeting in December 1929 the Advisory Board recommended that one or more Indian officers should be selected and sent to England for training in cinema production and that in the meantime if funds permitted an expert from England should be obtained with the assistance and at the expense of the Empire Marketing Board. The Governing Body accepted this recommendation in so far as the selection and sending to England of two Indians at the expense of the Empire Marketing Board was concerned.

2. As the next step Mr. H. A. F. Lindsay, the Indian Trade Commissioner in London, with whom the scheme had originated was addressed as to how the Council should proceed further in regard to the matter. It is now proposed to give two Indians 6 months' training each in India under the Cinema Expert of the Railway Board after which one would be selected for training abroad and would be sent for final training under the best available conditions, whether in England, Germany or Canada; further that the Council should offer to bear the salary of the officer selected during the whole of the period of training but that the Empire Marketing Board should be asked to bear the cost of the travelling expenses from India, during the deputation in England, Germany or Canada, and back to India again together with a subsistence allowance and any other incidental expenses during the period of training.

3. It has also been ascertained from the Railway Board that they are prepared to train two Indians under their Cinema Expert subject to certain conditions.

It is for the Advisory Board to consider whether the proposal as now altered by the Indian Trade Commissioner and under which a financial liability not contemplated before will fall on the funds of the Council is worth pursuing. If the Advisory Board recommends that it should be proceeded with, the Board is requested to lay down in broad outline the duties which the Cinema Expert will have to perform on his return after training.

M. S. A. HYDARI,
Secretary.

21st November 1930.

The Railway Department (Railway Board) are quite willing to take two film officers for training in the Central Publicity Bureau on the following terms :—

- (i) The Imperial Council of Agricultural Research will be responsible for the pay and allowances of the two film officers while attached to the Central Publicity Bureau.
- (ii) The two film officers will travel on railways on duty passes in the same way as other officers in the Central Publicity Bureau do.
- (iii) The two officers will be available for any work undertaken in the Bureau, but the Bureau will take in hand at once the preparation of a film on any suitable subject selected by the Imperial Council of Agricultural Research, the cost of the preparation of the negative of the film being borne by the Council but not to exceed Re. 1 per foot. The Imperial Council of Agricultural Research will pay the actual cost of any positive copies required by them. This will come to about five annas a foot.
- (iv) The two film officers will remain under training for six months, at the end of which time, the specialist film officer will submit a report as to which of the officers is more suitable for selection for further training in England. This period is proposed on the assumption that the two film officers will have had some film experience before being selected.

2. The Railway Department would point out for the information of the Imperial Council of Agricultural Research that the conditions have changed considerably during the last few months and that there will be some difficulty in getting suitable training for the officer in the silent film production as they understand that no companies of repute are now producing silent films. The technique of talking films is totally different from that of silent films.

(Sd.) N. CALDER.

The 1st July 1930.

APPENDIX XXV.

TESTING OF INDIAN AGRICULTURAL PRODUCTS IN ENGLAND.

In July last the Indian Trade Commissioner in London raised the question of the procedure to be followed in future in the case of testing of Indian agricultural products in England and *inter-alia* made the suggestion that the Imperial Council of Agricultural Research should be regarded as the proper authority in India to which such requests should be addressed in the first instance so as to make the most of such facilities as can be obtained. In brief, the proposal implies (1) that all requests for the testing in Great Britain of Indian agricultural products should, in the first instance, be addressed to the Imperial Council of Agricultural Research, and (2) that, once undertaken, the results of such tests should be communicated to the Council.

2. The Government of India (Education, Health and Lands Department) and the Local Governments including the North-West Frontier Province but excluding the Government of Burma from whom a reply is expected have agreed to the proposals explained in paragraph 1 above. They are now submitted to the Advisory Board for information.

M. S. A. HYDARI,
Secretary.

The 15th December 1930.

Extract from letter dated the 16th July 1930, from the Indian Trade Commissioner, India House, London, to the Vice-Chairman, Imperial Council of Agricultural Research.

You will remember the case of the milling and baking tests which are being carried out under the auspices of the Empire Marketing Board on behalf of Pusa. Subsequently various Provincial authorities desired to get similar tests made by direct reference to research institutions in this country. In the present instance Dr. Shaw was apparently unaware of the results of malting tests which had already been carried out by Mr. Lloyd-Hind on behalf of various Provincial Governments in India. There appears therefore to be a considerable lack of organisation both in the methods adopted to get agricultural produce tested in this country and also in the dissemination in India of the results of such tests.

In these circumstances I am desired to suggest that the Imperial Council of Agricultural Research should be regarded as the proper authority to which requests for the testing of Indian agricultural products should be addressed in the first instance. Applications which the Imperial Council decide to pass on should then be referred to the High Commissioner, who is in touch with many institutions in this country and is able to elicit their support and to settle detailed questions arising during the course of the research operations. I am to suggest that this procedure would make for efficiency and that the approval of the Government of India and of Local Governments be obtained with a view to its adoption in similar cases in future.

APPENDIX XXVI.**APPLICATION FROM THE GOVERNMENT OF MADRAS FOR A GRANT
FOR RESEARCH WORK ON POTATOES.**

Attention is invited to the attached letter (Enclosure I) from the Government of Madras, No. 2931-III(30-1, dated the 3rd November 1930, in regard to the grant for work on potatoes at the Experiment Station, Nanjanad, in the Madras Presidency. A note containing a brief history of the Station with a short account of local agriculture is also attached (Enclosure II). The scheme involves a non-recurring expenditure of Rs. 8,000 for quarters and Rs. 20,000, recurring, spread over 5 years, or a total expenditure of Rs. 28,000. The scheme is submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

The 2nd December 1930.

ENCLOSURE I.

LETTER FROM THE SECRETARY TO THE GOVERNMENT OF MADRAS, DEVELOPMENT DEPARTMENT, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, DELHI, No. 2931-III|30-I, DATED THE 3RD NOVEMBER 1930.

I am directed to address the Council of Research in the matter of a grant for work on potatoes.

2. At present work on potatoes is being done on a restricted scale at Nanjanad on the Nilgiris and is confined to the testing of strains of potatoes, methods of cultivation and manuring for this purpose and the station is under the control of the Curator, Botanical Gardens, Ootacamund, who is also in charge of the fruit stations on the Nilgiris. The staff at present employed on the station is as follows :—

- (1) One Upper Subordinate.
- (2) One Lower Subordinate.
- (3) One Probationer.

And a statement showing the expenditure incurred on the station during the last five years is enclosed.

3. The Director of Agriculture of this Province proposes to take up work on the production of new strains of potatoes and their distribution for seed purposes and is willing also to undertake to supply seed for test to all other Governments in India. As the work on fruits done in this Province is proposed to be expanded, the Curator will have no time to attend to the work on potatoes now proposed to be done and so the Director of Agriculture has proposed the following additional staff.

- (1) One Gazetted Officer on Rs. 250—25—750 to be in charge of the work.
- (2) Substitution of the existing Lower Subordinate at the Station by an Upper Subordinate.
- (3) A fieldman on Rs. 35—1½—50.

Quarters for items 1 and 3 above will also have to be provided at a cost of Rs. 8,000.

4. The scheme is of all-India importance as the Provinces of Bombay, Assam, Central Provinces and Berar, Punjab and United Provinces also are interested in work on potatoes. Barring item (2) specified above in the last paragraph, the expenditure that will have to be incurred on the scheme during the next five years is as follows, assuming that the work can be started on 1st April 1931.

| | | | | |
|---------|----|----|----|--|
| 1931-32 | .. | .. | .. | Rs. 3,135 plus Rs. 8,000 for quarters. |
| 1932-33 | .. | .. | .. | Rs. 3,738. |
| 1933-34 | .. | .. | .. | Rs. 4,056. |
| 1934-35 | .. | .. | .. | Rs. 4,374. |
| 1935-36 | .. | .. | .. | Rs. 4,692. |

5. As this Government are already incurring an average annual expenditure of Rs. 15,000 in this connection, while other Provinces also will be benefitted by the scheme and as the recurring expenditure involved is small, I am to request that the Council will be pleased to provide both for the recurring and non-recurring expenditure during the next five years.

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Statement showing the amount spent for the Agricultural Research Station,
Nanjanaad, for the years 1925-26 to 1929-30.

| Particulars. | Expenditure during | | | | |
|--|--------------------|---------------|---------------|---------------|---------------|
| | 1925-26. | 1926-27. | 1927-28. | 1928-29. | 1929-30. |
| | Rs. | Rs. | Rs. | Rs. | Rs. |
| Pay of establishment | 2,577 | 2,028 | 2,615 | 2,746 | 2,517 |
| <i>Allowances—</i> | | | | | |
| <i>voted :—</i> | | | | | |
| Travelling allowance | 264 | 166 | 185 | 76 | 175 |
| Other compensatory | 664 | 504 | 618 | 624 | 536 |
| Honoraria, voted | 15 | .. | 10 | .. | 5 |
| Miscellaneous | 116 | 77 | 165 | 36 | 50 |
| Works—New Works and Petty Construction and Repairs. | 9,181 | 691 | 83 | 1,312 | 698 |
| Capital outlay | 861 | 304 | 360 | 227 | 198 |
| Working expenses | 5,925 | 9,431 | 9,448 | 11,095 | 11,400 |
| Charges payable to Government departments and others. | 300 | 300 | 300 | 300 | 300 |
| Total | 19,903 | 13,401 | 13,784 | 16,416 | 15,879 |

ENCLOSURE II.

BRIEF HISTORY OF THE POTATO EXPERIMENT STATION, NANJANAD,
WITH A SHORT ACCOUNT OF LOCAL AGRICULTURE.

The Potato Experiment Station was established in 1917 after a good deal of time had been spent in selecting the site. It is situated about halfway between the village of Kuruthukulli and Nanjanad. Easy access by motor to the station is now possible by a road constructed to it. This road branches off at Andy's Corner on the Governor's Shola Road. The distance to the Potato Experiment Station from Ootacamund is 10½ miles. The station was originally scrub jungle and grass land and a portion of it appears to have been cultivated many years ago. The soil is typical of that to be found on the Nilgiris and is therefore somewhat poor. It is all dry land excepting two acres of swamp. The Station is exposed to the south-west monsoon the winds of which usually damage the haulms of the potatoes. The area of the station is 90.16 acres and the portion at present under cultivation measures approximately 36 acres. The chief crop is potatoes, but korali, samai are grown in rotation and lupins are grown as a green manure crop. The objects of the station are (1) to import and grow disease-free potatoes of good varieties and to distribute them to the ryots for seed purposes at a reasonable price, (2) to experiment with the different kinds of manures to find out which are the best for the district, (3) to carry out various experiments with green manures, rotation of crops, etc., and (4) to encourage the ryots to adopt more up-to-date methods of cultivation and to grow better varieties of potatoes than they usually do. Two crops of potatoes are grown annually, the first being planted in March and the second in August. The best time to see the station is during the months of May and November, the crops then being in full growth.

2. The much needed spring showers usually commence during the first week of April and if the rain is sufficient, the potatoes planted in March soon commence to grow. Everything depends on these early showers, and if they do not occur or if they are light, the growing period of the crop is shortened; for when the monsoon sets in about the 10th June the high winds which accompany it blow the haulms to pieces and growth is slow. Moreover "Early Blight" (*Alternaria solani*) sets in and destroys the leaves. Towards the end of August a second crop of potatoes is planted, but these do not grow so rapidly as the first crop, the "seed" not having been kept so long, the shoots are therefore weaker; this altogether with the uncertainty of the North-east monsoon and the liability of frosts occurring in November, makes the second crop an uncertain one and it is called a "seed crop", *i.e.*, for use for planting purposes in February and March. With careful storage, however, and an up-to-date storeroom it is possible to keep the crop lifted in July and August until the following March, but such "seed" is more useful for planting in February in drained swamps or where irrigation is possible.

3. The crop grown by the surrounding ryots include potatoes, barley, korali, samai, amaranthus, onions and other vegetables. The ryots' methods of potato cultivation are extremely primitive and it is a common sight to see them planting potatoes little larger than a marble. The "sets" are often planted so close as 6" apart in the rows and 15" between the rows. Cattle manure is used at the time of planting, but in limited quantities, as it is difficult to obtain. Korali is sown on poor land without any cultivation other than ploughing a few inches deep, no manure being applied as a general rule. After korali has been sown the land is allowed to lie fallow for some years. The cattle kept by villagers are extremely poor and give little milk; the buffaloes are much better animals, the coarse grass of the Nilgiris apparently suiting them better than it does other cattle. Much of the wornout land around the Badara Valleys should be planted with Wattle (*Acacia dealbata*) or other quick growing tree to provide fuel for the villagers as the women have to go miles to collect

wood for cooking purposes. Such wornout land if regenerated as described above would provide valuable arable land for future generations. Wild pigs do an incredible amount of damage to the crops, and much expense is incurred in erecting walls and making trenches, etc., around the farms.

4. The ryots practise rotation of crops in a small way and they are beginning to appreciate the value of green manure crops and fertilizers.

Glossary.

| English or local names. | Botanical names. |
|-------------------------|--------------------------|
| Samai | Panicum miliare. |
| Korali | Setaria glauca. |
| Tenai | Setaria italica. |
| Barley | Hordeum vulgare. |
| Lupins | Lupinus sp. |
| Potatoes | Solanum tuberosum. |
| Kikuyu grass | Pennisetum clandestinum. |
| Prairie grass | Bromus unioloides. |

APPENDIX XXVII.

PARTICIPATION OF INDIA IN THE INTERNATIONAL DAIRY CONGRESS, COPENHAGEN, 1931.

India has been invited to participate in the Ninth International Dairy Congress which is to be held at Copenhagen in July 1931. A copy of the preliminary programme* of the Congress is enclosed. The question whether India should participate in the Congress is now for the consideration of the Advisory Board. If a delegation is sent the cost will fall on the funds of the Council.

M. S. A. HYDARI,

Secretary.

The 10th December 1930.

*(Not printed).

APPENDIX XXVIII.

REPRESENTATION FROM MESSRS. KIRLOSKAR BROTHERS, LTD., IN
REGARD TO RAILWAY FREIGHT RATES FOR AGRICULTURAL
IMPLEMENTS.

The attached representation (Enclosure I) from Messrs. Kirloskar Brothers, Ltd. in regard to railway freight rates for agricultural implements, is submitted for the consideration of the Advisory Board. Attention is, in this connection, invited to the letter from Major F. H. Budden, the Chief Publicity Officer, Railway Department (Railway Board), and a member of the Advisory Board (Enclosure II). It may be explained that though the representation in question was circulated to the members of the Advisory Board in connection with the subject of mechanical cultivation in India at its meeting held at Simla in June 1930, it was not discussed.

M. S. A. HYDARI,

*Secretary.**The 23th November 1930.*

ENCLOSURE I.

Letter from Messrs. Karkoskar Brothers, to the Secretary, Imperial Council of Agricultural Research, No. 514, dated the 18th April 1930.

With reference to the report of the meeting of the Research Council appearing in to-day's "Times of India", we find that the question of granting favourable rates to agricultural implements has not been given that attention which it deserves. It has been attempted to show therein that the agricultural implements have been given all the facilities that could be given but we maintain that the agricultural implements have not been given any concessions since the publication of the agricultural report, but on the contrary manures have been given by the Railway Board enormous concession. Just to illustrate our point further, we have to draw your attention to the fact that prior to the publication of the report, the manures were carried at Rs. 16/8/0 per ton from Bombay to Kolhapur and agricultural implements were carried at Rs. 17 per ton over the same distance but after the publication of the report the manures are carried on at Rs. 5/4/0 per ton from Bombay to Kolhapur where the rate for agricultural implements remains the same.

As a matter of principle, the indigenous industries ought to be given greater facilities but instead of doing that facilities are being given to the importers of chemical manures and we have therefore to draw your attention to this grievance and place these facts before the next meeting of the Council.

We are also enclosing herewith a copy of our letter addressed to the Railway Board for your perusal and guidance.

Trusting our case will receive favourable attention and thanking you in anticipation.

Reference No. 514.

To

The Deputy Director,
Railway Board.
Government of India,
Railway Department.
New Delhi.

18th March 1930.

SUBJECT:—*Railway freight rates for agricultural implements.*

DEAR SIR,

We have to acknowledge receipt of your letter No. 978-T. of 20th February 1930, and we have very carefully considered the reasons put forth by you for refusing our demand for concessional rates on agricultural implements and we still regret to say that the reply is not convincing and hence unsatisfactory.

You have quoted *in extenso* paragraph 109 of the Agricultural Commission and say you have done all you could in giving us concessional rates, but if you carefully go into the previous records and see you will find that the agricultural implements are being carried at first class rates since the last ten years and even the manures were carried at the same rates, but after the recommendation of the Agricultural Commission, the manures have been specially classified and are now being carried at specially reduced rates so much so that whereas previously the cost of carrying manures say from Bombay to Kolhapur was Rs. 16/8/0 per ton, the said manures are now being carried on at Rs. 5/4/0 and the agricultural implements carried at first class cost Rs. 15 from Karkoskaravadi to Bombay a distance of 50 miles shorter than the distance

between Bombay and Kolhapur. We fail to see how manures can be said to be of greater importance to the agriculturists than the implements, as in our opinion, both are equally essential and if any comparison were to be made implements can be said to be of prime necessity to a farmer as manures are of no use unless the land is first ploughed.

As a matter of fact the Agricultural Commission has recommended that concessions in freight should be given to the manufacturers of agricultural implements in India, but the present rates charged, as pointed out above, are not concessions at all, but on the contrary, facilities for transport of raw material from the sources of supply to the factory and the finished products from factory to the places are being refused to the manufacturers of agricultural implements. Whereas the dealers in chemical manures who mainly deal in imported stuff are given enormous facilities the indigenous manufacturers of agricultural implements are refused any concessions in rates which we think is unfair. You will further see that in paragraph 109 of the Agricultural Commission's report, the Commission have recommended special rates for the carrying of raw materials to the factory and even though they are now classified as 2nd class no special concession has been given for the carrying of raw materials from the source of supply to the factory.

In your letter No. 978-T., dated 16th January 1930, addressed to the Indian Merchants' Chamber, Bombay, you state that even before the recommendation of the Royal Commission on Agriculture, you had gone into this question and certain machines have been re-classified as Agricultural Implements. This fact has been brought out to show that manufacturers of agricultural implements have been given special concessions. But in this respect what has been done by you is only this. Certain implements such as sugar-cane mills drawn by bullocks, etc., were classified by the Railway in 2nd class as machinery whereas similar mills when imported entered the country duty free being classified in the Tariff Schedule as agricultural implements, we therefore pointed out to the Board that whereas, at one place, the Government was classifying the sugar-cane mills, etc., as agricultural implements they are classifying them on railway under the head of machinery which was an obvious injustice and after a good many representations, the Railway Board agreed to classify the sugar-cane mills, etc., under the head of agricultural implements. By this the Railway Board agreed to remove an injustice to which the manufacturers of agricultural implements were long subjected.

Lastly, as stated by you, we had applied to the Railways concerned to give us some special concessions, but they all have refused to accede to our request and we enclose herewith the copies of their replies for your perusal.

We therefore trust you will consider our representation more sympathetically.

Yours faithfully,
KIRLOSKAR BROTHERS, LTD.
N. W. GURJAR.

Copy of the letter from the Deputy Director, Government of India, Railway Department (Railway Board), to Messrs. Kirloskar Brothers, Ltd., Kirloskaravadi, No. 978-T., dated the 20th February 1930.

SUBJECT:—Railway freight rates for agricultural implements.

With reference to the discussion which two of your representatives had with a Member of the Railway Board on the 17th instant when a request was made for a reduction in the railway freight rates for agricultural implements, I am directed to state that the Railway Board have given further consideration

to the reasons put forward for a reduction. These reasons, as stated by your representatives, were :—

- (a) The recommendations of the Agricultural Commission.
 (b) The fact that manures are carried at the minimum rate below which railways are not permitted to reduce their rates, and that agricultural implements are of as great value to agriculturists as manures.

2. I am to say that as regards (a), the Royal Commission on Agriculture in India suggested in paragraph 109 of their report that freight rates on agricultural implements and machinery should be re-examined from the point of view that it is greatly to the interest of railways to encourage internal manufacturers by charging the lowest possible rates for the movement to the factory of raw material and from the factory of the finished article all over the country, and that, where possible, concessions should be given. As explained in the Railway Board's letter* No. 978-T., of the 12th January 1929, the classification for agricultural implements and machinery had been examined by the Railway Board who sanctioned the following alterations :—

| | Previous classification. | | Present classification. | |
|---|--------------------------|----------|--|------------|
| | R. R. O. R. | | R. R. O. R. | |
| Agricultural implements (not machinery)— | | | Agricultural implements and machines not worked by their own power— | |
| Packed | 1 | .. | Packed | 1 .. |
| Unpacked | 3 | 1 | Unpacked | 3 1 |
| Agricultural implements (machinery) charged for as machinery | 4 | 2 | Ditto worked by their own power | 4 2 |

It will be seen from this that agricultural implements and machines not worked by their own power have now the lowest classification, viz., 1st class (0.38 pie per maund per mile) at railway risk when packed and at owner's risk when unpacked.

3. As regards the comparison of the rates for manures with those for agricultural implements and machines, I am to say that the Railway Board cannot accept the contention that freight rates for the latter should be influenced by those charged for a commodity like manures with which there can be no reasonable basis of comparison.

4. I am to add also that the Railway Board regret that they can see no reason in this case to depart from their practice of leaving it to railway administrations concerned to quote rates within the maximum and minimum of the class in which a commodity is placed. They are, however, sending the principal Railways a copy of this letter, and are asking them to consider favourably any representation you may make to them direct for the quotation of special rates for long distance traffic, more especially in full wagon loads, where such action can be taken with due regard to circumstances and without exposing railways to a charge of undue preference.

(Sd).

Deputy Director, Railway Board.

*Not received.

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ENCLOSURE II.

LETTER FROM MAJOR F. H. BUDDEN, CHIEF PUBLICITY OFFICER, INDIAN STATE RAILWAYS, TO THE SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, No. C. P. O.-45-I.G., DATED SIMLA, THE 14TH JUNE 1930.

I note that certain correspondence with Messrs. Kirloskar Bros. was printed in the agenda for the meeting of the Advisory Board of the Imperial Council of Agricultural Research during June 1930, in connection with the question of mechanical cultivation in India. This correspondence was not, however, referred to by any of the Members but as I presume that a reply will be sent to Messrs. Kirloskar Bros., I would like to bring the following points to your notice.

2. Messrs. Kirloskar Bros. argue that, because the rates for manures have been recently considerably reduced, the rates for agricultural implements should also be reduced. There are many factors which influence the fixing of rates and probably the two most important are the value of the commodity and the cost of transport. The cost of manure per ton is lower than the cost of agricultural implements per ton and it is an accepted principle that commodities of low value cannot bear the same rates as those of high value, as in the former case, the railway freight forms a considerable portion of the retail charge, whereas in the latter case it is often only a very small proportion. Railways have to earn a certain amount of money to cover the cost of running the railway and their overhead charges, and so it has been found that it is advantageous both to the consignor of low-priced commodities as well as to the consignor of high-priced commodities that the rate for the low-priced commodity should be comparatively on a lower scale.

3. The cost of transport is an important factor, and it is obviously cheaper for a railway to haul a wagon fully loaded than to haul a wagon carrying only a small proportion of the possible capacity in tons of that wagon. It is difficult to obtain a high average load with wagon loads of certain classes of agricultural implements and so it costs a railway more per ton of freight to haul a wagon loaded with such agricultural implements than a wagon fully loaded as the tare weight of the wagon remains the same.

4. Messrs. Kirloskar Bros. have made no attempt to show that the rate charged for agricultural implements is not reasonable, as the mere fact that the rate charged is higher than the rate charged for manures does not prove that the existing rate is not reasonable and one that the traffic cannot bear.

5. In paragraph 3 of the letter, dated 18th March to the Railway Board from Messrs. Kirloskar Bros. it is stated that facilities for transport of raw material from the source of supply to the factory are not given by the railways. The most important raw material in the manufacture of agricultural implements is probably steel bars and sheets. This commodity is placed in Class II with a maximum rate of .42 pie per maund per mile. A special through rate from Tatanagar to Kirloskarvadi has, however, been quoted for steel bars and sheets and this rate works out to .28 pie per maund per mile. Railways have, therefore, given a reduction of 33 per cent. in the rate and so it is incorrect to state that no facilities have been given.

6. All commodities in India are placed in one of the ten classes and for each class a maximum rate has been fixed by the Railway Board beyond which railways are not allowed to charge. There are in addition literally thousands of special rates quoted by railways for all classes of commodities. Railways quote such rates because sometimes they consider that the traffic cannot bear the maximum of the class rate, at other times they hope to obtain an indirect benefit by a greater use of a certain commodity which will increase the despatch of other commodities (such a commodity is manures), or because the quoting of a lower rate will enable a producer considerably to increase his output. The latter has also an important bearing on the cost of transport as the cost of transporting ■

commodity is higher for the initial distances and gradually decreases until it becomes constant. The changing of a special rate or the quoting of a new special rate requires a careful examination of all existing rates for that commodity and of similar commodities to work out the effect of such a special rate. A knowledge of local conditions is also essential. It is obvious, therefore, that it is quite impossible for the Railway Board to have the necessary information available to enable them to interfere in the quoting of special rates and this is rightly left to individual railways, the Railway Board being responsible for placing the various commodities in the different classes and for laying down the maximum and minimum rates for each class.

7. I would accordingly suggest that in the reply to Messrs. Kirloskar Bros. it should be stated that the Advisory Board do not agree that a just comparison can be made between manures and agricultural implements as there is a considerable difference in the value of these two commodities and in the cost of transport to a railway. It should also be pointed out that the mere fact that a lower rate is quoted for manures does not prove that the rate for agricultural implements is not reasonable and no attempt has been made to show that the existing rate is one that the traffic cannot bear or that a reduction in the rate will increase the total number of agricultural implements sold in India and not merely the number sold by Messrs. Kirloskar Bros. Messrs. Kirloskar Bros. might also be informed that it is understood that definite facilities have been provided by railways by the reduction of rates for the transport of raw material from the source of supply to the factory and that the statement made in paragraph 3 of their letter, dated March the 18th, is incorrect. A suggestion might be made that the Railway Board is not the correct body to whom applications should be made for special rates. Agricultural implements have already been placed in Class I or the lowest class and any further reduction must be obtained by the quoting of special rates by railways. It may be added that it is understood that the Railway Board have advised all railways that all applications for special rates for agricultural implements should be treated with careful consideration and obviously this will be done by railways as it is to their interests to encourage the transport of any article which is likely to improve the output from agriculture.

APPENDIX XXIX.

ASSISTANCE TO BE GIVEN BY THE INDIAN RAILWAYS CENTRAL
PUBLICITY BUREAU TO PROMOTING AGRICULTURAL AND
VETERINARY DEVELOPMENT.

Attention is invited to the attached memorandum by Mr. W. T. Aldous, Commercial Officer, Indian State Railways, Central Publicity Bureau, in regard to the subject mentioned above. The memorandum outlines possible directions in which railways can be of assistance to agriculture (including animal husbandry) in India and is submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,

Secretary.

The 12th December 1930.

MEMORANDUM FOR DISCUSSION AT THE NEXT MEETING OF THE ADVISORY BOARD
OF THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH.

SUBJECT :—*Assistance to be given by the Indian Railways Central Publicity Bureau and by Railways in promoting improved agricultural and veterinary methods.*

1. *Demonstration Trains.*—(a) *Provincial.*—The Punjab and Bengal Governments have co-operated with the North Western and Eastern Bengal Railways respectively in the running of Demonstration Trains in the past but some of the other Local Governments, although approached, have not seen their way to allotting the necessary funds. This year it is probable that the Punjab and Bengal Governments will not join in running any trains due to financial stringency. It is understood that Governments that have taken part in these trains believe fully in their efficacy as a medium of propaganda, and it is to be decided how funds are to be provided for them in future. The railway charges represent the cost of running only, and it is understood that these are but a small proportion of the cost of the train, so that even if railways were to reduce these charges, it would not solve the financial difficulty.

(b) *All-India.*—A proposal has been made to organise such trains on an All-India basis, with a tour of anything from three to eight months, covering the greater part of India either in one or more tours. There is some difference of opinion as to whether this proposal is feasible, owing to the different languages that would have to be used, and the changes necessary in staff for the same reason. A saving in cost would, however, be effected as only one set of exhibits would be required for all the provinces covered, but here again the question arises as to whether one set of agricultural exhibits would be suitable for the whole area. It has to be decided whether this proposal is practicable, and, if so, how it is to be financed. The normal railway charges amount to about Rs. 600 per unit of half a bogie carriage per mensem, or Rs. 7,200 a month for a train of six bogies.

2. *Films.*—Most of the larger railways now run regular cinema cars, and it is generally felt that this is a valuable medium of propaganda among audiences which are largely illiterate, especially if a lecturer is present to explain the films. The Imperial Council of Agricultural Research have had under consideration the appointment of two film production officers and it is a matter for consideration whether the appointment of these men should not be expedited. These men could also undertake the preparation of lantern slides for lectures. Suggestions are invited as to suitable subjects for films and slides for the encouragement of the better production of crops, and generally for raising the standard of living.

3. *Visits by Cultivators to Model Farms.*—There appears to be some difference of opinion as to whether cultivators should be encouraged to visit model farms, or whether demonstration plots only should be used for this purpose. A suggestion has been made that parties of about fifty cultivators should pay regular visits to model farms throughout the year, or at suitable times of the year, and that railways might then agree to the quotation of concession rates for such parties at one and a half fares for the return journey. It has to be decided whether such visits are to be encouraged and the idea proceeded with.

4. *Other methods by which Railways can assist Agriculture.*—Railways have an extensive machinery in existence throughout India which might be usefully employed in distributing propaganda for better agricultural methods, or possibly even in the exhibition and sale of improved implements at stations. The views of the Council are invited on this subject.

5. *Liaison between Railway and Agricultural interests.*—The question arises whether the present system provides adequate touch between railways and agriculture or whether some better means of liaison would be desirable. It might be advisable to have a definite officer working with the present Central Publicity

Bureau, which would interest itself and railways in agricultural requirements and act generally as a clearing house between the two departments. In that case Publicity Officers on railways, working under their Agents, would develop a similar interest in agricultural requirements, and would keep the railway officials interested in such matters. This is purely a tentative proposal, but the views of the Council on it would be welcomed.

N. B.—The above note has been submitted by the Railway Member on the Advisory Board as a basis for discussion, and any decisions arrived at would require the approval of the Railway Board and the Railways concerned.

APPENDIX XXX.

DRY-FARMING RESEARCH SCHEME FOR THE BOMBAY DECCAN.

Attention is invited to the attached letter from the Government of Bombay No. 5088-A/24, dated the 14th November 1930, and of its enclosure, regarding a dry-farming research station for the Bombay Deccan. The scheme, which is explained fully in the printed pamphlet, provides, in addition to a central research station for subsidiary stations located in the districts of Bijapur, Ahmednagar and Ahmedabad respectively. The scheme as a whole has the support of the Government of Bombay with this modification that the local Government do not consider a centre in the Ahmedabad District essential for the investigation proposed.

2. The scheme involves a total expenditure of Rs. 3,98,151 for a period five years (Rs. 68,741 non-recurring and Rs. 65,882 per annum recurring). Excluding the cost (estimated at Rs. 45,112) of the sub-station in the Ahmedabad District not recommended by the Government of Bombay, the cost of the scheme which is now for the consideration of the Advisory Board, is reduced to Rs. 3,53,039 for a period of five years. The Government of His Exalted Highness the Nizam have also, as suggested by the Government of Bombay, been approached in the matter. Their reply is awaited.

M. S. A. HYDARI,

Secretary.

The 13th December 1930.

Copy of a letter No. 5688-A/24, dated Bombay Castle, 14th November 1930, from G. K. Joshi, Esquire, I.C.S., Under-Secretary to the Government of Bombay, Revenue Department, to the Secretary, Imperial Council of Agricultural Research.

SUBJECT :—*Dry-Farming Research Scheme. Application for a grant-in-aid for the—*for the Bombay Deccan.

With reference to your letter No. 1817-Genl., dated 17th September 1930, I am directed by the Government of Bombay (Transferred Departments) to forward 100 copies of the Dry-Farming Research Scheme (Annexure) for the Bombay Deccan prepared by the Agricultural Department in this Presidency and to state that the problem of dry-farming is not wholly a provincial one. The conditions in the adjoining country are very similar notably in the Hyderabad State and parts of Madras. The Scheme was laid before the Provincial Agricultural Research Committee at its meeting held on 13th October 1930. The Committee has asked this Government to commend the scheme to the favourable consideration of the Imperial Council of Agricultural Research. The Government of Bombay support the scheme as a whole. They would however urge that no centre should be opened in the Ahmedabad District as it is not essential for the investigation proposed. Besides, it increases the difficulties of control and adds unnecessarily to the cost. They also consider that the Imperial Council of Agricultural Research should approach the Government of His Exalted Highness the Nizam with a view to securing their participation in the scheme. I am to add that the question of the contribution to be paid by this Government towards the cost of the scheme can be settled by negotiation hereafter.

ANNEXURE.

DRY-FARMING RESEARCH SCHEME FOR THE BOMBAY DECCAN.

THE PROBLEM.

One of India's greatest problems in the past has been famine. The development of easy transport and the opening up of the labour market have done much to mitigate the human suffering associated with famine; but these have had no effect upon the agricultural conditions which bring about crop failure. Agriculture over the greater part of India is still a gamble in rain, and in no part of the country is this more true than in the Bombay Deccan, perhaps the most precarious tract in the whole of India.

It has been computed that nearly one-third of the total area of the Bombay Presidency (excluding Sind) is very liable to periodic famines and scarcities due either to the total failure of the rains or to their unsuitable distribution. Another one-third of the area is also liable to famine though more rarely. The former tract embraces the districts of Ahmednagar, Sholapur and Bijapur in the East Deccan and the eastern portions of Poona, Satara, Belgaum and Dharwar Districts. This tract contains about 25 per cent. of the total population of the Presidency while the less liable tract contains about 38 per cent. of the Presidency population. Thus the two tracts taken together contain about 63 per cent. of the entire population of the Presidency.

Apart from gratuitous relief and the suspension and remission of land revenue, the Bombay Government has spent over 10 crores of rupees on irrigation works in its efforts to strengthen the economic condition of the Deccan. Nevertheless the total irrigated area in any district does not exceed seven per cent. of the total cultivated area. The rest of the land depends upon rain.

WORK DONE SO FAR BY THE DEPARTMENT OF AGRICULTURE.

The Bombay Department of Agriculture has, so far as its limited resources admit, been working on this problem for some years. This work falls into two divisions:—

- (a) Dry-farming research.
- (b) Bunding operations.

As regards bunding operations it may be pointed out that there is an indigenous practice among the people to construct field embankments to prevent the rain flood-water running to waste and scouring the land. A study of this work revealed the fact that most of these embankments were unscientifically designed and hence steps were taken to assist the public as regards the design and construction of these embankments. There are now four whole-time officers engaged on this work and their services are very greatly appreciated. Thus in 1928-29 32 schemes (including plans and estimates) were prepared in the Bijapur District alone. The average cost of these village bunding schemes worked out at about Rs. 1,500. In addition 22 schemes in this district were prepared for the reclamation of small nalla beds. Much time was also devoted to the inspection of previously executed works and advice, where necessary, was given as regards repairs.

Dry-farming research was started in a small way at Maniri near Poona six years ago. The establishment consists of an officer, one graduate assistant, one clerk, one laboratory boy and two peons.

The equipment consists of a piece of land measuring some 5 acres and a small laboratory. The budget amounts to Rs. 11,842 as indicated in the margin. The research work done on this dry-farm experimental station having an annual average rainfall of

| | | | |
|------------------------------|-------|--|--------|
| Pay of officer at Rs. 520 .. | 6,240 | Rs. | 11,842 |
| Pay of Establishment .. | 3,192 | as indicated in the margin. The | |
| Contingencies .. | 2,410 | research work done on this dry-farm experimental | |

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20.04 inches (varying from 14.38 to 25.94), indicates the great possibilities of turning the available rainfall to better account in an average year and of making grain production a practicable proposition in a bad year when it would ordinarily fail. By the intelligent application of dry-farming methods an average crop, even in a year of considerable draught, can be produced on soils of reasonable depth.

It has been ascertained that the amount of water taken up by the crop from the rain-water-supply can be increased by about $1\frac{1}{2}$ acre-inches (i.e., over 60 per cent.). This means an additional yield of about 1,000 lbs. of dry weight (380 lbs. grain and 620 lbs. fodder) per acre. In bad years it is this extra water which makes the difference between grain failure and a fair crop.

The following table summarizes the important results of yields obtained on the Dry-farm at Maijri during the last six years under a varying rainfall.

| Year. | 1924. | 1925. | 1926. | 1927. | 1928. | 1929. |
|--|-------|-------|-------|-------|-------|-------|
| Annual rainfall .. | 25.94 | 14.38 | 19.63 | 22.03 | 20.39 | 17.91 |
| Yields of jowar grain, pounds per acre. | 1,085 | 445 | 1,037 | 1,386 | 1,364 | 1,255 |
| Yields of jowar fodder, pounds per acre. | 3,087 | 1,335 | 1,868 | 3,359 | 2,548 | 1,937 |

The yield on this land in 1929-30 without the dry-farming methods (i.e., managed as the cultivator manages the land) was per acre :—

| | | | | | |
|-----------|----|----|----|----|-------|
| | | | | | lbs. |
| Grain .. | .. | .. | .. | .. | 844 |
| Fodder .. | .. | .. | .. | .. | 1,270 |

while the corresponding yield on the plot managed according to the dry-farming methods was :—

| | | | | | |
|-----------|----|----|----|----|-------|
| | | | | | lbs. |
| Grain .. | .. | .. | .. | .. | 1,255 |
| Fodder .. | .. | .. | .. | .. | 1,937 |

A modest estimate of the value of the increased gross yield which a cultivator could obtain by adopting the dry-farming methods would be Rs. 5 per acre; and the total area of rabi-jowar in the three districts of Ahmednagar, Sholapur and Bijapur is over three million acres. If, therefore, we assume that, at least, one-third of the land is suitable for dry-farming methods (on account of the character of the soil) the annual aggregate gain to the agriculturists would amount to a very large figure if this method were generally adopted.

Sufficient has been said to indicate the potentialities of dry-farming methods in the Bombay Deccan and of its great economic significance to the country.

Hitherto owing to the limited resources of the Department for this research, and because it has been necessary to plan the work in such a way as to give quick results which could be easily appreciated by the public, it has been necessary to confine attention to comparatively simple investigations. Very little intensive fundamental research has so far been possible. It is, however, a matter of first class importance to undertake comprehensive research as soon as circumstances permit.

RESEARCH PROPOSED.

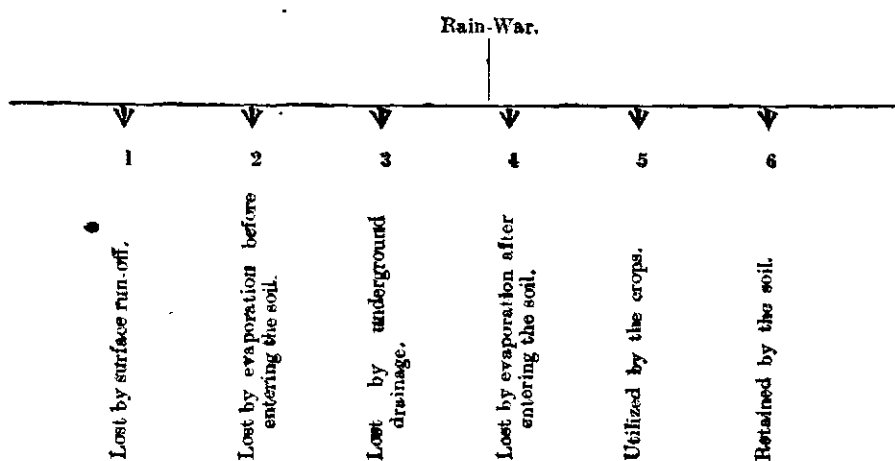
It is accordingly proposed to promote such a scheme of Research with the assistance of the Imperial Council of Agricultural Research. The work to be done falls into three divisions :—

- (1) The Soil,
- (2) The Plant, and
- (3) The Field.

In the soil division the following problems demand intensive study :—

- (a) Soil-classification.
- (b) Disposal of the rain-water in different soils receiving different treatments under varying conditions of topography.

From the following diagram it will be seen that there are six possible fates awaiting the rain-water :—



(c) Properties of different soils, receiving different treatments, with special reference to—

- (1) Penetration of rain-water after each fall of rain on cropped and fallow land ;
- (2) Evaporation of soil-moisture on cropped and fallow land ;
- (3) Water-holding capacity ; porosity, hygroscopic coefficient, capillarity, moisture equivalent and wilting coefficient.

In the Plant division the following problems demand similar intensive study :—

- (a) The water requirements of different crop-plants with special reference to transpiration and the quantity of water required to produce a pound of dry matter ;
- (b) The root-systems of different crop-plants ;
- (c) Meteorological factors including winds, humidity ; temperature and sunshine ; and the reactions of crop-plants to these factors.

In the Field division the problems to be solved include—

- (a) Conserving the maximum quantity of the rain-water in typical soils under varying environments with special reference to surface-gradients.

This work includes—

- (1) the comparison of deep and shallow cultivation with reference to their influence upon the absorption of rain-water by the soil ;
 - (2) testing the value and best methods of making small bunds to control rain-water and erosion ;
 - (3) testing the value of surface-cultivation after each fall of rain ;
 - (4) testing the value of inter-cultivation at different periods of the life of the crop.
- (b) Finding the implements best calculated to achieve the objects of dry-farming ;
- (c) Ascertaining the best treatments for different crops grown under the dry-farming system with special reference to seed-rates, spacings and manure ;
- (d) Adjusting dry-farming methods to the economics of the farm.

The whole value and significance of dry-farming is governed by economics. In each tract of country one pair of bullocks is deemed necessary for the cultivation of a given area of land (farmed according to a given system). If dry-farming methods involve more work it follows that more bullocks and men will have to be maintained during the busy seasons. Against this it is to be noted that agriculturists have a great deal of spare time in the off-seasons in the famine zone. It is obvious, however, that the ideal methods likely to be suggested by the research done in the soil and plant sections will have to be materially modified to make them fit into the economics of the farm and hence the importance of this adjustment work is very great.

Moreover it appears necessary that this field work should be done at several centres representative of the famine zone. It is therefore proposed that in addition to the centre where the fundamental research is done there should be three other centres, making four in all, where this adjustment of treatments to economics can be carried out. At each of these plots certain important observations and determinations would also be made in order to enable the staff to interpret correctly the behaviour of the crops. These would include—

- (1) determinations of soil-moisture at different depths in plots receiving different treatments, at least once per month throughout the year ;
- (2) determinations of the depth of penetration of rain-water after every substantial fall of rain, and the observation of the time when the upper and lower moistures meet ;
- (3) meteorological observations including rainfall, temperature and humidity.

ORGANIZATION REQUIRED.

LAND.

From the foregoing sections it will be gathered that the soil and plant research will be done at one centre, and that in addition to this centre there will be three centres where field research is undertaken, making four centres in all.

It is considered that the vicinity of Sholapur would be the most suitable centre for the main research and that the other centres should be—

Bagewadi in Bijapur District.

Ahmednagar in Ahmednagar District, and

a place to be selected in Ahmedabad District.

The area of land required at each centre would be 40 acres except the principal centre where 50 acres would be necessary. Thus 170 acres of land in all will be required to be rented at an estimated rental of Rs. 12 per acre.

STAFF.

The staff required would consist of :—

Principal Centre.

| | Per mensem. |
|--|-------------|
| | Rs. |
| One Chief Investigator Class I rank (Rs. 320 to 1,200), starting on say | 760 |
| One Class II Officer (Rs. 250—20—750) starting on .. | 410 |
| One Senior Assistant in Grade I of Subordinate Agricultural Service (Rs. 220—10—300) starting on .. | 250 |
| Two Senior Assistants in Grade II of Subordinate Agricultural Service (Rs. 150—5—200) starting on .. | 175 |
| One Junior Assistant in Grade III of Subordinate Agricultural Service (Rs. 105—5—140) starting on .. | 125 |
| Three Non-graduate Fieldmen (on Rs. 30—5½—80) starting on | 50 |
| One Laboratory boy (on Rs. 18—1—20) starting on .. | 18 |
| One Clerk Accountant (on Rs. 85—5½—100) starting on .. | 85 |
| One Junior Clerk (on Rs. 30—5½—80) starting on .. | 40 |
| One Naik on Rs. 20 | 20 |
| Two peons on Rs. 18 | 18 |

Three Sub-Centres.

| | |
|---|-----|
| Three Senior Assistants in Grade II of Subordinate Agricultural Service (on Rs. 150—5—200) starting on .. | 175 |
| Three Junior Assistants in Grade III of Subordinate Agricultural Service (Rs. 105—5—140) starting on .. | 125 |
| Three Non-graduates (on Rs. 30—5½—80) starting on .. | 50 |

BUILDINGS.

I. Residential and Office.—It is proposed that the staff at the principal centre should find their own quarters in Sholapur town, but that the following subordinate staff should be provided with kutchra quarters on the site of the plot :—

- (1) One Junior Assistant in Grade III of the Subordinate Agricultural Service.
- (2) Three Non-graduate Fieldmen.
- (3) One Laboratory boy.
- (4) Three peons.

II. Laboratory.—It will be necessary to construct a good laboratory building at the principal centre.

III. *Miscellaneous*.—Kutchha buildings to accommodate cattle, stores implements and coolies will be necessary at the principal centre.

IV. *Three sub-centres*.—(a) Kutchha quarters will have to be provided for the staff.

(b) Kutchha buildings to accommodate cattle, stores, implements and coolies will be necessary.

(c) A small laboratory will be necessary.

EQUIPMENT.

The following equipment will be required :—

- I. Laboratory fittings at principal centre and at three sub-centres.
- II. Livestock and Deadstock at all four centres.
- III. Fencing 6,580 feet at principal centre and 17,220 feet at three sub-centres.
- IV. Land improvements at all four centres.
- V. Lysimeters, Pot-culture House, etc., at principal centre.
- VI. Office furniture at all four centres.
- VII. Reference books at principal centre.

ESTIMATES.

The detailed estimates will be found in Accompaniment I.
The summary estimates are as follows :—

Non-recurring.

| Item. | Cost in rupees. | | |
|-------------------|-------------------|--------------------|--------|
| | Principal centre. | Three sub-centres. | Total. |
| Buildings | 12,205 | 17,775 | 29,980 |
| Equipment | 23,650 | 15,111 | 38,761 |
| Total | 35,855 | 32,886 | 68,741 |

Recurring.

| Item. | Average cost in rupees per annum. | | |
|----------------------------------|-----------------------------------|--------------------|--------|
| | Principal centre. | Three sub-centres. | Total. |
| Pay of officers | .. | .. | 15,480 |
| Pay of Establishment | 13,812 | 13,500 | 27,312 |
| Allowances and Honoraria | .. | .. | 5,300 |
| Contingencies | 6,900 | 10,590 | 17,790 |
| Total | .. | .. | 65,882 |

It will thus be seen that the total cost of the scheme is Rs. 3,98,151 for a period of five years. The contribution which the Bombay Department of Agriculture can make to this expenditure is Rs. 59,210 made up as follows :—

| Item. | Annual amount in rupees. | Total amount in five years in rupees. |
|------------------------------|--------------------------|---------------------------------------|
| Pay of Staff | 6,240 | } 59,210 |
| Pay of Establishment | 3,192 | |
| Contingencies | 2,410 | |

T. F. MAIN,
Director of Agriculture,
Bombay Presidency, Poona.

Accompaniment I.

DETAILED ESTIMATES.

NON-RECURRING EXPENDITURE.

Buildings.

Principal Centre.

| | |
|--|-----------------|
| I. Residential and Office (kutcha quality) | Cost in rupees. |
| | 6,005 |

| Type of staff. | No. of persons. | Square feet required. | Rate per square foot in rupees. | Cost in rupees. |
|------------------|-----------------|-----------------------|---------------------------------|-----------------|
| Graduate .. | 1 | 553 | 1.50 | 830 |
| Non-graduates .. | 3 | 450 × 3 = 1,350 | 1.50 | 2,025 |
| Coolies* | 6 | 800 | 1.50 | 1,200 |
| Office | 4 | 52 × 25 = 1,300 | 1.5 | 1,950 |

II. Laboratory (temporary quality)—

| | |
|--|-------|
| 65 × 25 = 1,375 at Rs. 3 per square foot | 4,125 |
|--|-------|

*These include one laboratory boy and one peon.

| | | | Cost in rupees. | |
|--|-----------------------|---------------------------------|---------------------------------|-----------------|
| <i>III. Miscellaneous (kutcha quality) ..</i> | | | 2,075 | |
| Type of building. | Square feet required. | Rate per square foot in rupees. | Cost in rupees. | |
| Cattle shed (3 pairs) | 25 × 20 = 500 .. | 1.75 | 875 | |
| Store | 40 × 15 = 600 .. | 1.25 | 750 | |
| Implement shed | 20 × 10 = 200 .. | 1.25 | 250 | |
| Manure pit and rain-gauge .. | .. | .. | 200 | |
| Total for principal centre | | | 12,205 | |
| <i>Each Sub-Centre.</i> | | | | |
| | | | Cost in rupees. | |
| <i>I. Residential (kutcha quality)</i> | | | 2,225 | |
| Type of staff. | No. of persons. | Square feet required. | Rate per square foot in rupees. | Cost in rupees. |
| Graduate | 1 | 553 | 1.50 | 830 |
| Non-graduate | 1 | 450 | 1.50 | 675 |
| Coolies | 3 | 480 | 1.50 | 720 |
| <i>II. Laboratory and office (temporary quality)—</i> | | | | |
| 40 × 15 = 600 square feet at Rs. 3 per square foot | | | 1,800 | |
| <i>III. Miscellaneous (kutcha quality)</i> | | | 1,900 | |
| Type of building. | Square feet required. | Rate per square foot in rupees. | Cost in rupees. | |
| Cattle shed (2 pairs) | 20 × 20 = 400 .. | 1.75 | 700 | |
| Store | 40 × 15 = 600 .. | 1.25 | 750 | |
| Implement shed | 20 × 10 = 200 .. | 1.25 | 250 | |
| Manure pit and rain-gauge .. | .. | .. | 200 | |
| Total for each Sub-Centre | | | 5,925 | |
| Therefore total for three Sub-Centres | | | 17,775 | |
| Grand total for Principal and three Sub-Centres | | | 29,990 | |

Equipment.

| | Rs. | Cost in rupees. |
|--|--------|--------------------|
| <i>I. Laboratory fittings—</i> | | |
| (a) At principal centre | 10,000 | |
| (b) At three sub-centres (Rs. 300 each) | 900 | |
| | <hr/> | 10,900 |
| <i>II. Livestock and Deadstock—</i> | | |
| <i>Principal Centre.</i> | | |
| (a) 3 pairs of cattle | 1,050 | |
| (b) Implements | 600 | |
| (c) Weighing machine | 300 | |
| | <hr/> | 1,950 |
| <i>Three Sub-centres.</i> | | |
| (a) 2 × 3 = 6 pairs of cattle | 2,100 | |
| (b) 3 sets of implements at Rs. 600 | 1,800 | |
| (c) 3 weighing machines at Rs. 300 | 900 | |
| | <hr/> | 4,800 |
| <i>III. Fencing—</i> | | |
| (a) Principal Centre 6,580 feet at Rs. 1,900 per mile — | 2,300 | |
| (b) 3 Sub-centres 5,740 feet × 3 = 17,220 at Rs. 1,900 per mile = | 6,411 | |
| | <hr/> | 8,711 |
| <i>IV. Land Improvement—</i> | | |
| (a) Principal Centre 50 acres at Rs. 20 | =1,000 | |
| (b) 3 Sub-centres 3 × 40 = 120 acres at Rs. 20 | =2,400 | |
| | <hr/> | 3,400 |
| <i>V. Lysimeters—</i> | | |
| Pot culture house and other structures at principal centre | | 7,000 |
| <i>VI. Office furniture—</i> | | |
| (a) At principal centre | 400 | |
| (b) At three sub-centres (Rs. 200 each) | 600 | |
| | <hr/> | 1,000 |
| <i>VII. Reference books</i> | | 1,000 |

Recurring Expenditure.

| Name of head. | Budget Estimates. | | | | |
|---|-------------------|---------------|---------------|---------------|---------------|
| | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. |
| PRINCIPAL CENTRE. | Rs. | Rs. | Rs. | Rs. | Rs. |
| <i>Pay of officers.</i> | | | | | |
| One Chief Investigator Class I rank (Rs. 320—40—1,200) starting on Rs. 760 per mensem. | 9,120 | 9,600 | 10,080 | 10,560 | 11,040 |
| One Class II officer (Rs. 250—20—750) starting on Rs. 410 per mensem. | 4,920 | 5,160 | 5,400 | 5,640 | 5,880 |
| Total | 14,040 | 14,760 | 15,480 | 16,200 | 16,920 |
| <i>Pay of Establishment.</i> | | | | | |
| One Senior Assistant in Grade I of Subordinate Agricultural Service (Rs. 220—10—300) starting on Rs. 250 per mensem. | 3,000 | 3,120 | 3,240 | 3,360 | 3,480 |
| Two Senior Assistants in Grade II of Subordinate Agricultural Service (Rs. 150—5—200) starting on Rs. 175 per mensem. | 4,200 | 4,320 | 4,440 | 4,560 | 4,680 |
| One Junior Assistant in Grade III of Subordinate Agricultural Service (Rs. 105—5—140) starting on Rs. 125 per mensem. | 1,500 | 1,560 | 1,620 | 1,680 | 1,680 |
| Three Non-Graduate Fieldmen on Rs. 30—5/2—80 starting on Rs. 50 per mensem. | 1,800 | 1,800 | 1,980 | 1,980 | 2,160 |
| One Laboratory Boy on Rs. 18—1—20. | 216 | 228 | 240 | 240 | 240 |
| One Clerk Accountant on Rs. 85—5/2—100. | 1,020 | 1,020 | 1,080 | 1,080 | 1,140 |
| One Junior Clerk on Rs. 30—5/2—80 (Rs. 40 per mensem). | 480 | 480 | 540 | 540 | 600 |
| One Naik on Rs. 20 per mensem | 240 | 240 | 240 | 240 | 240 |
| Two Peons on Rs. 18 per mensem each. | 432 | 432 | 432 | 432 | 432 |
| | 12,888 | 13,200 | 13,812 | 14,112 | 14,652 |

| Name of head. | Budget Estimates. | | | | |
|---|-------------------|--------------|--------------|--------------|--------------|
| | 1st year. | 2nd year. | 3rd year. | 4th year. | 5th year. |
| THREE SUB-CENTRES. | Rs. | Rs. | Rs. | Rs. | Rs. |
| <i>Pay of Establishment.</i> | | | | | |
| Three Senior Assistants in Grade II of Subordinate Agricultural Service (Rs. 150-5-200) starting on Rs. 175 per mensem each. | 6,300 | 6,480 | 6,660 | 6,840 | 7,020 |
| Three Junior Assistants in Grade III of Subordinate Agricultural Service (Rs. 105-5-140) starting on Rs. 125 per mensem each. | 4,500 | 4,680 | 4,860 | 5,040 | 5,220 |
| Three Non-Graduate Assistants on Rs. 30-5/2-80 starting on Rs. 50 per mensem each. | 1,800 | 1,800 | 1,980 | 1,980 | 2,160 |
| | 12,600 | 12,960 | 13,500 | 13,860 | 14,400 |
| <i>Allowances and Honoraria</i> | | | | | |
| Travelling Allowance | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Conveyance Allowance as under— | | | | | |
| One officer in Grade I @ Rs. 75 per mensem. | | | | | |
| One officer in Grade II @ Rs. 50 per mensem. | 3,300 | 3,300 | 3,300 | 3,300 | 3,300 |
| Five Subordinate (three Graduate Assistants and two Clerks) @ Rs. 30 per mensem each. | | | | | |
| Total .. | 5,300 | 5,300 | 5,300 | 5,300 | 5,300 |

Contingencies.

| Serial number. | Item. | Average annual cost in rupees. |
|--------------------------|--|--------------------------------|
| <i>Principal Centre.</i> | | |
| 1 | Rent of land 50 acres × 12 rupees | 600 |
| 2 | Field-section | 2,500 |
| 3 | Soil-section | 2,000 |
| 4 | Plant-section | 1,000 |
| 5 | Office incidental expenditure including stamps and periodicals | 300 |
| 6 | Annual repairs to buildings | 500 |
| | Total | 6,900 |
| <i>Each Sub-Centre.</i> | | |
| 1 | Rent of land 40 acres at Rs. 12 per acre | 480 |
| 2 | Field operations | 2,000 |
| 3 | Laboratory expenses and requisites | 800 |
| 4 | Office incidental expenditure | 100 |
| 5 | Annual Repairs to buildings | 250 |
| | Total for each sub-centre | 3,630 |
| | Total for three sub-centres | 10,890 |

APPENDIX XXXI

ESTABLISHMENT OF AN AGRICULTURAL RESEARCH STATION AT
RISALEWALA (NEAR LYALLPUR) FOR WORK ON THE WATER
REQUIREMENTS OF CROPS.

The establishment of an Irrigation Research Station was under consideration as far back as 1917 when the All-India Board of Agriculture recommended that the Government of India should set up a Hydrological Station on a large scale. In 1919, at a meeting of certain Irrigation and Agricultural Officers of the Punjab, it was decided to frame a Provincial Scheme with a view to its possible future expansion into an Imperial Scheme. No progress has been made in the matter.

The subject of Irrigation research is a matter of immense importance to several of the Provinces in India and whilst the results which would be obtained at any one research station in India might, owing to climatic and other conditions, not be applicable in their entirety to the whole of India, they would doubtlessly throw light of the greatest value, to all-India, on many problems connected with irrigation farming.

The present position in the Punjab is that for the past five years or so an area of 300 acres of land has been set aside on the Risalewala Seed Farm as the nucleus of such a Research Station. The farm is situated at a distance of 3 miles from Lyallpur City and 5 miles from the Agricultural College and Research Institute.

The investigations which would be carried out on this station require the collaboration of an Agriculturist, a Plant Physiologist and an Engineer. It is proposed that the Professor of Agriculture should be the Agriculturist in charge and that the Agricultural Engineer should carry out the Engineering work in conjunction with the Irrigation Department. The Irrigation expert will have full control over the Hydraulic Side of the experiment.

The land at Risalewala is at present laid out for ordinary cultivation. Before hydraulic experimental work could be undertaken a complete change of layout (plan* attached) will be necessary.

LAYOUT OF LAND.

This is estimated to cost Rs. 2,73,185. All channels require to be made pucca in order that irrigation water supplied to crops may be accurately measured and additional sources of supply such as seepage as well as loss by absorption from kacha channels be eliminated. The installation of measuring weirs within each square is necessary to take measurements of all water used. Provision has also to be made for iron outlets and water level recorders.

BUILDINGS.

The estimated cost of the buildings required is Rs. 1,45,020. A Rest-house at the Risalewala farm can be utilized as a residence for the Farm Manager. For further details see Statement No. 4 appended.

STAFF.

The details of the staff required have been worked out after much discussion. The cost thereof including Travelling Allowance comes to Rs. 50,828 per annum. This includes provision for a physiologist in the grade of pay which has been sanctioned for the Class I, Provincial Agricultural Service ; also for a Gazetted Officer of the rank of an Extra Assistant Director of Agriculture who will be in charge of the experimental work. It also provides for a Statistical Assistant and the necessary subordinate staff of Agricultural Assistants, Mukaddams, etc., for field and laboratory work. For details see Statement No. 3.

*Not printed.

Statements 5 and 6 show details of other expenditure such as equipment of the farm, purchase and keep of cattle, water rates, etc. The total cost of the scheme is estimated at Rs. 6,62,800 capital and Rs. 63,000 recurring,—*vide* Statement No. 1. The capital cost includes the sum of Rs. 2,10,000 which is the value of the land and which being Government land will not have to be purchased.

The proposal was considered by a Committee appointed by the Punjab Government to consider schemes of Irrigation Agricultural Research and their report is appended as Annexure.

ANNEXURE.

REPORT OF AGRICULTURAL IRRIGATION RESEARCH COMMITTEE ON THE SCHEME FOR ESTABLISHING A HYDRAULIC STATION AT RISALEWALA.

" We considered the report and estimate submitted by the Director of Agriculture, and are of opinion that as the proposed research station is essentially for the determination of the water requirements of various crops it would obviate any likelihood of confusion if the scheme is defined as 'Station for Agricultural Research on the water requirements of Crops.'

The possibility of confusion lies in the fact that there is very great scope for research into the effect of irrigation water on soils and the *tolerance* of various soils with regard to water, a subject which is purely a function of the Irrigation Department and necessitates investigation in various parts of the Province. Whereas, Agricultural Research on the water requirements of the crops embraces an entirely different line of investigation including the *optimum* crop obtainable per unit of water, the *optimum* crop per acre, the *optimum* size of 'Kiari' for different crops and discharges, the minimum quantity of water required to avoid damage to crops and the critical period for the application of water, etc. Such research work like the *complementary investigations on improved methods of applying water to the crop, cultural methods leading to water economy or to the avoidance of water strain and the effect of differential irrigation on the quality of agricultural produce,* is primarily a matter for the expert agriculturist and can conveniently be carried out at Risalewala near Lyallpur.

We consider that for this research work a Physiologist who would deal entirely with the Plant side of the investigation would be of greater service than the Soil Physicist allowed for in the proposed scheme. *Field experiments alone are inadequate, the response of the plant to varying conditions and the indirect effect of irrigation on the other factors, controlling plant growth require careful study involving the use of modern methods of measuring plant development.* We also consider that the addition of a Statistical Assistant is very essential for the correlation, etc., and *charting* of the day to day results and recommend the addition of a sum of Rs. 200 per mensem rising to Rs. 300 per mensem as the salary of this Assistant.

Regarding the proposed layout of the experimental area, the form of construction of the waterproof channels and the type of the various water measuring devices, etc., that are required, we recommend that the plans and specifications for this portion of the work prepared by the Agricultural Department should be submitted to Mr. E. S. Crump, Scientific Research Officer of the Irrigation Department, for scrutiny and the benefit of his experience and advice, in order that the best arrangements possible may be obtained with regard to the distribution and accurate measurement of water supplied to the various sizes of plots and fields under investigation.

The methods of obtaining and keeping all records of water distribution and measurement to be *decided* in consultation with Mr. E. S. Crump and *all such* records to be available to the Irrigation Department. The Scientific Research Officer periodically inspecting the Station to see that the water measurements are being satisfactorily maintained.

Very great benefit will be derived from the institution of this research station : the problem of the water requirements of crops is one on which reliable information has been of paramount importance since canal irrigation commenced in India and more so since the Agricultural Department came into being and has done so much to widen and improve the staple industry of the Province.

With the slight modifications mentioned above we strongly recommend the establishment of the station for agricultural research on the water requirements of

crops at an estimated cost of Rs. 6,62,785, and Rs. 60,250 per annum recurring cost. We trust that the Imperial Council of Agricultural Research will favourably consider the grant of Rs. 2,73,185 towards the capital cost and Rs. 48,150 per annum towards recurring costs."

• • • • •

E. S. CRUMP,

Scientific Research Officer, Irrigation Research Laboratory, Lahore.

D. P. JOHNSTON,

Assistant Director of Agriculture.

T. B. TATE,

Superintending Engineer, Waterlogging Investigation Circle, Lahore.

T. A. MILLER BROWNLIE,

Agricultural Engineer to Government, Punjab, Lyallpur.

STATEMENT No. 1.

Summary showing financial aspects of the Agricultural Research Station at Risalewala.

| | Recurring. Rs. | Non-recurring. Rs. |
|---|-------------------|-----------------------|
| 1. Land 300 acres at Rs. 700 per acre | .. | 2,10,000 |
| 2. Layout of land and construction of khals | .. | 2,73,185 |
| 3. Establishment | 45,828 | .. |
| 4. Travelling Allowance of Establishment | 5,000 | .. |
| 5. Buildings | .. | 1,45,020 |
| 6. Implements | 400 | 9,880 |
| 7. Furniture | 200 | 2,000 |
| 8. Other charges and contingencies | 600 | .. |
| 9. Water-rate, seed and manure | 1,800 | 1,000 |
| 10. Laboratory Equipment | 2,000 | 10,000 |
| 11. Purchase of cattle | .. | 9,100 |
| 12. Upkeep of cattle | 7,200 | 2,600 |
| | 63,028 | 6,62,785 |
| or say | 63,000 | 6,62,800 |

STATEMENT No. 2.

Showing estimated cost of layout of one square of land for the Agricultural Research Station at Risalewala.

| | Rs. | Rs. |
|--|--------|--------|
| (1) Layout of land per square— | | |
| 1. Levelling the old khals, at Rs. 10 per acre | .. | 275 |
| (2)-A. Cost of making water courses with Concrete Channels (per square of 27.8 acres)— | | |
| (a) Excavation— | | |
| | Rs. | |
| Khal 1,100 × 3½' × 1½' × 5' | 29,575 | |
| Main khal 1,100/2 × 9/2 × 5/2 | 6,188 | |
| 35,763, say 36,000 at 10 per cent. | .. | 360 |
| (b) Concrete channels— | | |
| Small khal .. 5,500 } 6,600 at Rs. | .. | 15,125 |
| Large khal .. 1,100 } 2-12-0 per foot. | .. | 3,025 |
| (c) Iron outlets 400 at Rs. 12-8-0 each | .. | 5,000 |
| (d) Measuring weirs 5 at Rs. 100 each | .. | 500 |
| (e) Level Recorders 1 for two square ½ at Rs. .. 1,100 | .. | 550 |
| | 2 | |
| Total | .. | 24,835 |
| Total cost for 300 acres or 11 squares 24,835 × 11 = 2,73,185 | | |

STATEMENT No. 3.

Showing detail of staff required for the Agricultural Research Station at Risalewala.

Officer and Officials—

| | Rs. | Rs. |
|---|-------|--------|
| (a) 1 Physiologist on Rs. 360—40—720\|760—40—800—50—1,000 (pause) 50—1,150, say | 4,600 | |
| 1 Extra Assistant Director of Agriculture—200—250—25—750 at Rs. 250 | 3,000 | |
| 4 Agricultural Assistants of at least three years standing—100—10—200—10—300 at Rs. 130 | 6,240 | |
| 1 Statistical Assistant at Rs. 250 | 3,000 | |
| 8 Mukaddams on Rs. 20—1—30—2—50 | 1,920 | |
| 1 Storekeeper on Rs. 40—2—80—2—90 | 480 | |
| 1 Clerk on Rs. 40—2—80—2—90 | 480 | |
| 1 Mistri on Rs. 40—1—80 | 480 | |
| 2 Peons at Rs. 14 per mensem each | 336 | |
| | ————— | 20,526 |
| (b) Engineering Staff— | | |
| 1 Assistant Engineer on Rs. 525—50—1,225 | 6,300 | |
| 1 Overseer on Rs. 80—7—250 | 960 | |
| 2 Sub-Overseers on Rs. 60—5—120 | 1,440 | |
| 1 Draftsman on Rs. 80—2—150 | 960 | |
| 4 Khalasis on Rs. 14 per mensem each | 672 | |
| 1 Peon on Rs. 14 per mensem | 168 | |
| | ————— | 10,500 |
| (c) 2 Agricultural Assistants each on Rs. 100—10—200\|10—300 at Rs. 100 each | 2,400 | |
| 1 Laboratory Attendant on Rs. 20—1—30 | 240 | |
| | ————— | 2,640 |
| (d) 36 beldars at Rs. 22 per mensem each | 9,504 | |
| 2 Chaukidars at Rs. 14 per mensem each | 336 | |
| 2 Sweepers at Rs. 13 per mensem each | 312 | |
| Variable labour and harvesting allowance | 2,000 | |
| | ————— | 12,152 |
| (e) Travelling Allowance | 5,000 | 5,000 |
| | ————— | |
| GRAND TOTAL | | 50,828 |

STATEMENT No. 4.

Showing details of buildings required for use of staff, bullocks, godowns, etc.,
at the Agricultural Research Station at Risalewala.

BUILDINGS.

| | Rs. |
|--|--|
| Two office rooms 16' x 16' .. | } 84,940 |
| One implement shed 80' x 15' .. | |
| Two fodder stores 15' x 15' .. | |
| One bullock shed 180' x 12' for 40 bullocks | |
| Four seed godowns each 20' wide and 24', 22', 26' and 30' long, respectively | |
| Also a pucca platform 30' wide in front of the godowns | |
| Four 'C' Type quarters for Agri- cultural Assistants | |
| Eight 'D' type quarters for Mukad- dams | |
| Eighteen 'E' type quarters for Beldars and Mali | |
| Twenty-nine 'F' type quarters for single beldars | |
| One manure pit 42' x 24' .. | |
| 1 quarter for the Extra Assistant Director of Agriculture .. | (He will occupy the Risale- wala farm Resthouse.) |
| 1 quarter for Assistant Engineer .. | 10,000 |
| 3 quarters for one Overseer and two Sub-Overseers | 14,000 |
| 1 quarter for Clerk | 2,100 |
| 1 quarter for Draftsman | 2,100 |
| 1 quarter for Mistri | 2,100 |
| 1 quarter for Storekeeper | 2,100 |
| Extension of bullock shed | 1,080 |
| 12 culverts for roads | 1,800 |
| 1 office room | 5,000 |
| 2 manure pits | 800 |
| 1 Chemical Laboratory | 4,000 |
| 3 quarters for two Chemical Assis- tants and one Laboratory At- tendant | 10,000 |
| 1 Well | 5,000 |
| Total .. | 1,45,020 |

STATEMENT No. 5.

Showing the implements required for the Agricultural Research Station at Risalewala.

| | Rate. | | Amount. |
|---|-------|-------|-----------------------------|
| | Rs. | A. P. | Rs. |
| 12 Raja ploughs | 37 | 8 0 | 450 |
| 12 Horse Hoes | 40 | 0 0 | 480 |
| 10 bar Harrows | 14 | 8 0 | 145 |
| 6 Big Sohagas | 8 | 0 0 | 48 |
| 4 Small Sohagas | 6 | 0 0 | 24 |
| 2 Big Karahi Levellers | 8 | 0 0 | 16 |
| 2 Small Karahi Levellers | 6 | 0 0 | 12 |
| 6 Carts | 120 | 0 0 | 720 |
| 1 Raja fodder cutter (Bullock gear) | | | 400 |
| 1 Weighing machine | | | 300 |
| 4 Spring balances | 40 | 0 0 | 160 |
| 20 Munah ploughs | 6 | 0 0 | 120 |
| 20 Spades | 2 | 0 0 | 40 |
| 40 Sickles | 0 | 8 0 | 20 |
| 20 Tranglis | 1 | 8 0 | 30 |
| 20 Sangas | 1 | 0 0 | 20 |
| 16 Kasulis | 1 | 8 0 | 24 |
| 10 Kasulas | 1 | 8 0 | 15 |
| 8 Axes | 1 | 8 0 | 12 |
| 20 Hand Tokas | 2 | 0 0 | 40 |
| 2 Chutha Rambas | 1 | 0 0 | 2 |
| 40 Ploughing Chains | 4 | 0 0 | 160 |
| 10 Big Yokes | 6 | 0 0 | 60 |
| 40 Small Yokes | 4 | 0 0 | 160 |
| 1 Reaper | | | 350 |
| 1 Winnowing | | | 250 |
| Spares | | | 300 |
| 2 Cane Crushing Mills | 220 | 0 0 | 440 |
| 2 Pans with grating | 40 | 0 0 | 80 |
| | | | <hr/> 4,878 or say 4,880 |
| Engineering Equipment :— | | | |
| Hook gauges and complete meteorological apparatus | | | 5,000 |
| | Total | | <hr/> 9,880 |

STATEMENT No. 6.

Showing details of Office furniture required for the Agricultural Research station at Risalewala.

Agricultural Sections.

| | Rs. | Rs. |
|--|-----|-----|
| 2 Big Almirahs | 140 | |
| 4 Tables | 130 | |
| 8 Chairs | 50 | |
| 8 Paper baskets | 16 | |
| 2 Stationery cabinets | 20 | |
| 1 Table Lamp | 6 | |
| 4 Closed iron paper trays | 72 | |
| 1 Iron safe | 150 | |
| 1 Cash Box | 56 | |
| 1 Saddle and bridle | 100 | |
| 1 Rack for keeping registers, etc. | 10 | |
| Stationery | 50 | |
| Service Stamps | 50 | |
| Registers, Forms, etc. | 50 | |
| Total | | 900 |

Engineering Section.

| | | |
|--|-----|-------|
| 1 Table for Sub-Divisional Officer | 50 | |
| 1 Table for Draftsman | 80 | |
| 1 Table for Subordinate | 30 | |
| 1 Almirah for Subordinate | 70 | |
| 1 Almirah for Draftsman | 100 | |
| 1 Stationery Cabinet | 20 | |
| 8 Chairs and shelf | 100 | |
| 2 Stools | 10 | |
| Racks, paper trays, etc. | 100 | |
| | | 560 |
| Drawing material | | 500 |
| GRAND TOTAL | | 1,960 |
| Say | | 2,000 |

NOTE REGARDING THE ESTABLISHMENT OF A STATION AT RISALEWALA (NEAR LYALLPUR) FOR AGRICULTURAL RESEARCH ON THE WATER REQUIREMENTS OF CROPS.

In most areas where the success of agricultural operations depends on the supply of water through canals, there is apt to be a conflict between the Irrigation authorities who, basing their charges on a rate per acre irrigated, wish to spread the water over the maximum area, and the cultivator who may, for his own reasons, prefer to concentrate his supply on a smaller area.

In irrigation farming important problems before the cultivator are :—

- (a) the optimum amount of water from the point of view both of outturn and of profit to use on each crop and on each field, so that he may adjust his cropping in the most economical way consistent with his water supply,
- (b) the best way to distribute over his crops the water available at each canal rotation throughout the growing period of the crops, and
- (c) the extent of the loss entailed by different degrees of deviation from these ideals.

Inter-related with these problems of the cultivator is that of the Canal Department, namely, the optimum quantity of water to allow per acre. This depends not only on the amount needed per acre of each crop, but also upon the relative profitableness of different degrees of intensity of cultivation. Obviously, it must always be a loss to the State, and generally also to the cultivator, if excess of water is applied per acre instead of spreading the supply over a larger area, or increasing the intensity of cropping, or growing crops which will give a more profitable return.

The return for the water used and the amount of water which it is best to use depend to a great extent on the physical structure of the soil, as well as on the condition of the soil at the time of sowing and during the growth of the crop. This condition, in its turn, is closely connected with the rotation of crops grown. The object of these experiments, then, is to determine the relationship between the amount of water applied per acre to each of the important canal colony crops and the yields of these crops, together with the investigation of other closely allied problems bearing on irrigation farming.

Amongst others the following lines of investigation will be undertaken :—

- (a) the water requirements of crops under various conditions of soil, cultivation, rotation, etc. ;
- (b) the economics of different systems of irrigation and the cost of water in these various systems ;
- (c) the methods of application of irrigation water ;
- (d) the study of meters, modules and outlets and their bearing on water distribution and economy ;
- (e) the effect of physical and cultural factors on the loss of water from the soil, and
- (f) the effect of different meteorological conditions on water requirements of crops.

The foregoing lines of work are not exhaustive but they indicate some of the important problems awaiting solution. These problems are common to the Punjab, the United Provinces and Sind, and though the individual crops may differ in certain cases, the general results will be of immense value to all irrigated tracts.

APPENDIX XXXII.

SCHEME FOR RESEARCH ON PLANT PHYSIOLOGY AT THE HINDU
UNIVERSITY, BENARES.

Attention is invited to the application (Enclosure I) from the Benares Hindu University for a grant towards a scheme of agricultural research at the University and to the recommendations in this regard of the United Provinces Research Committee (Enclosure II). The Government of the United Provinces have forwarded the recommendations of the Provincial Research Committee without comment nor have they stated whether they propose to make any grant from Provincial Revenues towards the cost of the scheme. They have been addressed in the matter but their reply has not so far been received. It is thought however that as the scheme was prepared by the University early in 1930 and the Provincial Research Committee has made specific recommendations thereon the Advisory Board might desire to proceed with its examination.

M. S. A. MYDARI,

Secretary.

16th December 1930.

ENCLOSURE I.

APPLICATION FROM THE VICE-CHANCELLOR, BENARES HINDU UNIVERSITY, TO THE HON'BLE SIR MOHAMMAD HABIBULLAH, KT., K.C.S.I., K.C.I.E., CHAIRMAN, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH, DATED THE 5TH MARCH, 1930.

I have the honour to submit for the consideration of the Imperial Council of Agricultural Research a scheme for the development of agricultural research at the Benares Hindu University.

2. *Situation and accessibility.*—In dealing with the position of Pusa the Royal Commission on Agriculture deplored the comparative inaccessibility of the Pusa Institute. They observed :—

“The choice of Pusa as a site for an all-India research institute was, as we have seen, mainly determined by the fact that a large Government estate happened to be available for the purpose. An ideal site for a central Research Institute for all-India was doubtless impossible of attainment, but we cannot but regard it as a matter for regret that the site actually selected was one six miles from a Railway Station, in an out-of-the-way district to which access from most parts of India can only be obtained by a river-crossing and from all parts by a somewhat tedious railway journey.”

I beg to point out that Benares is almost the centre of India and is most easily accessible from all parts of the country.

3. *Centre of education and research.*—In another part of their Report the Commission observed :—

“It is unfortunate, from the point of view from which we are considering this problem, that Pusa was not, from the outset, an educational as well as a research institute. Constant stream of men returning from Pusa to the Provinces would have furnished an excellent means of maintaining contact between the Imperial and Provincial departments and would have placed the latter in a better position to discover in what ways the work done at Pusa could be made of value to them.”

With reference to this observation of the Commission I am to point out that the Benares Hindu University is a centre both of education and research.

4. *Agricultural Research at Benares.*—In dealing with the question of agricultural research at Indian Universities the Commission observed :—

“The position of the Indian Universities in regard to agricultural research cannot be regarded as satisfactory. The Madras, Bombay, Nagpur and Lahore Universities have faculties of agriculture. The Calcutta University has established a Chair of Agriculture and the University of Benares has now founded a similar Chair to which we make further reference in our chapter on Education, paragraph 463. But it does not appear that at any Indian University steps have been taken to bring agricultural research into close relationship with the other branches of science taught at the Universities. Agricultural research is regarded as entirely a matter for the Government agricultural colleges. It should not, in our view, be isolated in this way. In a country so large as India in which the problems involving research in every direction which must be solved if the potentialities of agricultural production are to be realised are so numerous, it is plain that Government institutions cannot cover the whole field. The importance of carrying out agricultural research in the closest touch with other branches of scientific research can hardly be exaggerated. The advantages of mutual intercourse between research workers in different fields have been

demonstrated in many countries, and Indian Universities and Agricultural Colleges can no longer afford to work in isolation. We look forward to a state of affairs in which the Universities will not only initiate agricultural research but will also undertake schemes of research the importance of which is brought to their notice by the Agricultural department. It will, we fear, be long before the Universities are in a position to take over agricultural research to the extent to which it has been taken over by the Universities in Western countries, but this is the end which should be kept steadily in view and which both the Universities and Government should endeavour to reach as speedily as possible."

I beg to inform the Council that from its inception the Benares Hindu University has kept before itself the idea of developing a Faculty of Agriculture and providing for both instruction and research in agriculture. Its department of Botany, and particularly the Plant Physiology section which forms its most important branch, has been especially developed as part of a programme of instruction and research in agriculture. When the University began its work in Plant Physiology, there was hardly any real teaching in this subject in any other Indian University and there were no students available for taking up research work in this branch. This University has slowly trained its students and raised the standard progressively in this subject.

5. *Our present equipment for carrying on Experimental Research of Agricultural Importance.*—Our curriculum has been so designed as to be of direct agricultural utility. Out of a thousand marks for the M. Sc. examination, fifty per cent. are allotted to theory. We have a full paper for Plant Breeding and another for Plant Physiology (including Phyto-chemistry and Vio-physics). We lay special stress on the improvement of crop production both from the genetical and the physiological points of view. In addition to the above special studies, we are maintaining a high standard in other subjects—Plant Anatomy, Cytology, Plant Pathology, Ecology and Plant Geography—such as obtains in other Universities.

Out of the remaining five hundred marks, three hundred are assigned to the practical work in the subjects enumerated above in due proportions. Students are further required to submit a thesis incorporating the results of original research in Plant Physiology, in part fulfilment of the requirements for the degree of Master of Science. This must come up to the standard of publication in a recognised botanical or agricultural journal. The thesis carries two hundred marks.

It will thus be seen that while maintaining our standard sufficiently high and in keeping with that of Universities abroad, we have endeavoured to give an economic bias to the education that we impart in this subject. It is gratifying to note that other Indian Universities also have recognized the value of physiological teaching and have introduced it in their courses of study.

6. *Our degree.*—This insistence upon a sufficient practical training in research along with a sound theoretical knowledge, has given a high value to our degrees in Botany. This University was the first to have started post-graduate teaching in Botany in these provinces, and out of our twenty M. Sc.'s one has obtained the D. Sc. degree on a thesis relating to "Growth, Senescence and Rejuvenescence in Plants". There has been a good demand for the students turned out by this department and most of them are holding important and responsible positions in the various Universities and agricultural organisations (Annexure E). It is gratifying to note that those of our students who have gone abroad for degrees in Agriculture or Botany have been highly spoken of. There are at present nine students on the rolls of the M. Sc. classes who are engaged in plant physiological research on detached problems to be finished within a short and limited time. A B. Ag. from the Poona Agricultural College has joined this department for a short term training in higher agricultural

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research and applications from agricultural graduates for being admitted in order to receive higher training at research are being received.

7. *Want of adequate facilities.*—The further development of this section of Plant Physiology has been hampered owing to want of funds.

We have for a long time past desired to establish a suitable field laboratory where the work could be undertaken and carried on efficiently, but, owing to the reason stated above, its establishment has been delayed.

The facilities that we already possess are for carrying on work mainly under laboratory conditions in Respiration, Carbon-Assimilation, Transpiration, Growth-rates and Carbo-hydrate metabolism. They are just sufficient to fulfil the requirements of the M.Sc. curriculum and to enable the work of the M.Sc. students on small and detached problems being carried on. But they leave no surplus for higher work by other research workers devoting themselves to field investigations of definite agricultural importance. The scope and the utility of the work outlined has therefore been limited by the absence of this provision especially on the applied side.

8. *Our present resources and equipment.*—The establishment of an Agricultural College, equipped both for instruction and research, has been one of the original objects of the Hindu University. It is with this idea that the large area of nearly 1300 acres was acquired by the University. A scheme for such a college was prepared in consultation with Dr. H. Mann, the late Sir Ganga Ram Bahadur, Mr. Sam Higginbotham and other scholars, and the University has made an attempt to raise the necessary funds for the establishment of the college. But the donations which it has so far obtained have not been sufficient to enable it to do so. Therefore without giving up the idea of an Agricultural College, the University has decided to establish an Institute of Agricultural Research. The University has obtained donations to the extent of over six lakhs for promoting scientific education in Agriculture. One lakh of this sum is earmarked for the cutting of a canal from the Ganges and the donations of the Jodhpur State are earmarked for the building of the Institute of Agricultural Research and endowing a chair of agriculture to be called the Irwin Chair of Agriculture. The Kapurthala Durbar has also earmarked its annual grant of Rs. 6,000 for a Chair of Agricultural Chemistry. The building of the Institute of Agricultural Research is already in the course of construction. The first floor of the building which is to cost one lakh is expected to be ready in November next.

9. Out of the land already in the possession of the University 500 acres of land is available for experimental farms in blocks of more than 50 acres. In addition to this His Highness the Maharaja of Benares has been pleased to sanction a permanent lease being granted to the University of nearly 2,100 acres of agricultural land between the University and the Ganges which can be used for agricultural work of various kinds. By its soil, climate and rainfall Benares is eminently suited for growing most of the Indian crops and developing an ideal Institute for agricultural research.

10. The Royal Commission on Agriculture emphasised the advantage of a number of science departments being grouped together at one centre. The Hindu University is peculiarly happy in having a number of departments of pure and applied science located on one site and working in co-operation with each other. We have a College of Mechanical, Electrical and Civil Engineering with a large workshop which can help us in developing agricultural engineering and in manufacturing such apparatus and implements as we may require. We have our departments of Geology, and Mining and Metallurgy which can be of great help in the study of soils *i.e.*, Agricultural Geology. We have also departments of Chemistry and Physics well equipped for higher work. Our department of Industrial Chemistry can provide help of various kinds in the matter of sugar technology, oil extraction, etc. Our department of Zoology has specialised in Entomology. Last, though not the least, we have a well developed department of Economics which encourages the study of Rural Economics.

Appendix G will give an idea of the steps the Hindu University has already taken with the object of providing facilities for post-graduate research in Agricultural Plant Physiology which is engaging the attention of investigators all over the world. The present Section of Plant Physiology will be transferred to the Institute of Agricultural Research to form the nucleus of research in (1) Farm crops, fruits and vegetables, (2) Agricultural Plant Physiology, (3) Physiological aspects of Plant breeding, (4) Plant Pathology and (5) Phyto-chemistry, along with soil analysis.

10. *Our needs and our proposals.*—Having thus made provision for a large separate building for housing the Institute of Agricultural Research, plenty of land for experimentation, the existing equipment of the Department of Plant Physiology and two professors to guide research, the University asks the co-operation of the Imperial Agricultural Research Council in the shape of substantial grants to help it in promoting the advancement of Indian agriculture.

The immediate requirements of the University in this connection are :—

A. Funds for completing the building of the Institute of Agricultural Research.

B. Funds for furnishing and equipping the Institute.

C. Facilities for Field work.

(1) Enclosing an area of at least thirty-five acres of land for an Experimental Farm containing a Green House, a Hot House, a refrigerating chamber (for conducting work under controlled conditions) and an Orchard.

(2) Sinking of well and fitting up of electric motor for pumping water (electric power being available).

(3) Provision for tilling the soil, manures and other requirements.

(4) Apparatus for Meteorological observations.

(5) Breeding appliances.

(6) Provision for the maintenance of the Farm.

D. Additional facilities for the laboratory.

(1) Appliances for the investigation of soil with reference to plant growth.

(2) Additional apparatus for physiological studies, viz., seed testing, water balance, respiration, assimilation, growth, energetics and cell physiology.

(3) Facilities for the study of plant materials, their origin and fate from the food-value point of view.

(4) Such histological apparatus as may be of direct help in any of the above studies.

E. Four Research Fellowships of the value of Rs. 200 per mensem to start with, and

F. Such other assistance as might be found essential for satisfactorily carrying on research work. Details of our requirements are given in the Annexures.

A general idea of the work which the Department of Plant Physiology contemplates and of its existing activities are given in Annexure C.

11. I hope the information I have placed before the Council will satisfy it that a very useful centre of agricultural instruction and research is being developed at the Benares Hindu University, and I hope that the Council will

accept the offer of co-operation of the University in the building up of such a centre by sanctioning a non-recurring grant of Rs. 4,18,184 and a recurring grant of Rs. 61,277 which we ask for. The University will be glad to supply any further information that may be called for, and will, of course, always welcome the opinion and advice of the Council in promoting our common object.

ANNEXURE. A.

THE BUDGET.

Contributions of the Hindu University.

| | Rs. | A. | P. |
|---|----------|----|----|
| A. Agricultural Research Institute Building (First floor only, under construction) | 1,00,000 | 0 | 0 |
| B. Land for Experimental Farm and Orchard (500 acres) .. | 2,50,000 | 0 | 0 |
| C. Apparatus, etc., already at the disposal of the Department of Plant Physiology | 46,000 | 0 | 0 |
| D. Agricultural Implements (Plough, tractor, etc.), already with the University | 6,000 | 0 | 0 |
| E. Irwin Chair of Agriculture (Jodhpur investment of two lakhs to pay Rs. 1,000 per mensem) | 2,00,000 | 0 | 0 |
| F. Kapurthala Chair of Agricultural Chemistry (permanent grant of Rs. 6,000 yearly) | 1,20,000 | 0 | 0 |
| G. Contribution for a Canal (First instalment of Rs. 50,000 received Rs. 50,000 to be received this year) | 1,00,000 | 0 | 0 |
| Total | 8,20,000 | 0 | 0 |

ANNEXURE B.

GRANT REQUIRED FROM THE IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH.
Non-recurring Grant.

| | Rs. | A. | P. |
|--|----------|----|----|
| A. Additional grant for completing the building of the Institute of Agricultural Research | 1,00,000 | 0 | 0 |
| B. Grant for general fittings and furniture for the above | 30,000 | 0 | 0 |
| C. Additional show cases for keeping apparatus, chemicals, glass ware, rubber goods, etc. | 2,500 | 0 | 0 |
| D. Additional physiological instruments, apparatus and other requirements for general equipment :— | | | |
| (1) Workshop and Tools | 1,622 | 0 | 0 |
| (2) Glass blowing accessories | 442 | 0 | 0 |
| (3) Microscopy and Histology | 5,122 | 0 | 0 |
| (4) Thermostats, Regulators, Stirrers, motors, shafts, etc. | 3,510 | 0 | 0 |
| (5) Thermometers, Hygrometers, etc., for initial starting of work | 1,184 | 0 | 0 |
| (6) Brushes, Stands, Tripods, etc. | 1,730 | 0 | 0 |
| (7) Furnaces, Burners, Incubators, Baths, etc. | 3,979 | 0 | 0 |
| (8) Stills and Condensers | 735 | 0 | 0 |
| (9) Grinding Mills, Presses, Mortars and Pestles | 435 | 0 | 0 |
| (10) Rubber goods and corks (for initial equipment) | 535 | 0 | 0 |
| (11) Drawing Instruments | 624 | 0 | 0 |
| (12) Initial Herbarium Equipment | 340 | 0 | 0 |
| (13) Initial Breeding Equipment | 1,128 | 0 | 0 |
| (14) Initial Filter paper and Glass Filters | 530 | 0 | 0 |
| (15) Initial Glass goods | 4,042 | 0 | 0 |
| (16) Initial Chemicals and Stains | 1,325 | 0 | 0 |
| Total | 1,59,883 | 0 | 0 |
| E. Additional Special Research Apparatus :— | | | |
| (1) Seed Testing and Germination Apparatus | 1,850 | 0 | 0 |
| (2) Assimilation Apparatus | 5,637 | 0 | 0 |
| (3) Respiration | 1,912 | 0 | 0 |
| (4) Water Balance apparatus | 14,439 | 0 | 0 |
| (5) Growth apparatus | 1,253 | 0 | 0 |
| (6) Soil Analysis apparatus | 7,362 | 0 | 0 |
| (7) Balances and Weights | 1,594 | 0 | 0 |
| (8) Electric Instruments and other goods | 5,289 | 0 | 0 |
| (9) Meteorological apparatus | 1,845 | 0 | 0 |
| (10) Other miscellaneous Special Research apparatus for cell physiology, cell chemistry and cell physics, etc. | 13,845 | 0 | 0 |
| Total | 55,026 | 0 | 0 |

| | Rs. | A. | P. |
|---|----------|----|----|
| F. Additional Grant for back numbers of Journals and reference books | 10,000 | 0 | 0 |
| G. Experimental Farm, Orchard, Green and Hot Houses :— | | | |
| (1) 500 acres of land. | | | |
| (2) Fencing for 35 acres of land | 12,000 | 0 | 0 |
| (3) Construction of Pucca water channel | 6,000 | 0 | 0 |
| (4) Sinking two wells and fitting electric motor for irrigation (Electric power available. See recurring expenditure also) | 10,000 | 0 | 0 |
| (5) Water tank fitted with pipe for field experiments requiring water under pressure | 1,500 | 0 | 0 |
| (6) Agricultural implements other than those already in the University | 300 | 0 | 0 |
| (7) Bullocks five pairs (for the present) | 750 | 0 | 0 |
| (8) Green house, hot and refrigerating cells (as per attached design and measurements) | 17,000 | 0 | 0 |
| (9) Initial outfit for regulating the temperature of the cell | 6,875 | 0 | 0 |
| (10) Pots for culture work (earthen, wooden and of stone, etc.) | 600 | 0 | 0 |
| (11) Plants initially to be obtained for the Orchard | 350 | 0 | 0 |
| (12) Store rooms for seeds and implements | 2,000 | 0 | 0 |
| (13) Cattle shed and a small room for the cattle man | 1,000 | 0 | 0 |
| (14) Two rooms for chowkidars | 1,500 | 0 | 0 |
| Total | 60,775 | 0 | 0 |
| Grand total for non-recurring | 4,18,181 | 0 | 0 |
| <i>Recurring.</i> | | | |
| A. Laboratory Expenditure :— | | | |
| (1) Special Research apparatus to be supplemented every year | 3,000 | 0 | 0 |
| (2) Glass, porcelain and metal wares | 1,350 | 0 | 0 |
| (3) Chemicals and stains (including rectified spirit) | 1,325 | 0 | 0 |
| (4) Drawing accessories (including sectional papers and paper for drums, etc.) | 320 | 0 | 0 |
| (5) Filter papers and glass filters, etc. | 325 | 0 | 0 |
| (6) Herbarium materials | 90 | 0 | 0 |
| (7) Mercury | 60 | 0 | 0 |
| (8) Rubber goods, corks, etc. | 600 | 0 | 0 |
| (9) Photographic materials | 50 | 0 | 0 |
| (10) Materials for the repairs of apparatus, etc. glass blowing, for the workshop, including charges for such repairs as cannot be undertaken by the mechanic | 280 | 0 | 0 |

| | Rs. A. P. |
|---|------------------|
| (11) Thermometers, Hygrometers, brushes, etc. .. | 100 0 0 |
| (12) Microscopic accessories | 45 0 0 |
| (13) Labels of all kinds (paper) | 15 0 0 |
| (14) General upkeep of the Laboratory | 500 0 0 |
| (15) General stationery requirements for keeping records, publications and correspondence .. | 100 0 0 |
| Total .. | 7,860 0 0 |
| B. Maintenance of the Experimental Plot, Orchard, Green House, etc. | |
| (1) Supply of electric charges for pumping water... | 2,600 0 0 |
| (2) Buckets, sprayers, etc. | 30 0 0 |
| (3) New implements and repairing charges .. | 80 0 0 |
| (4) Feeding of three pairs of bullocks | 750 0 0 |
| (5) Recurring expenditure on the maintenance of Hot and Refrigerating cells | 450 0 0 |
| (6) Culture pots | 100 0 0 |
| (7) Seeds, cuttings, plants, etc. | 270 0 0 |
| (8) Manures | 620 0 0 |
| (9) Breeding requirements | 225 0 0 |
| (10) Seed storing accessories | 80 0 0 |
| (11) Special emergency field furniture, stands, etc., for conducting experiments | 50 0 0 |
| (12) Field Labels, etc. | 50 0 0 |
| (13) Miscellaneous expenditure | 300 0 0 |
| Total .. | 5,705 0 0 |
| C. Additional Current Journals and references particularly on Agriculture and allied subjects | 2,000 0 0 |
| D. Contingencies (including construction of special apparatus, payment of railway, postal and shipping charges, buying dusters, chalk, and other sundries for frequent use) .. | 1,500 0 0 |
| E. Research Staff :— | |
| (1) Research Professors 2 @ Rs. 500—50—1,000 .. | 24,000 0 0 |
| (2) Research Fellowships @ Rs. 200 per mensem at least FOUR fellows to start with | 9,600 0 0 |
| (3) Research Lab. and Field Assistant, one 75 rupees per mensem | 800 0 0 |
| (4) Lab. Assistant (to be in charge of store also) .. | 600 0 0 |
| (5) Fine mechanic @ Rs. 60 per mensem, one .. | 720 0 0 |
| (6) Typist and record keeper (also to be in charge of library, etc.), @ Rs. 60 per mensem .. | 720 0 0 |
| (7) Artist, @ Rs. 60 per mensem one | 720 0 0 |

| | Rs. | A. | P. |
|--|--------|----|----|
| (8) Field Supervisor, with practical experience of local conditions, crop plants, breeding and horticulture and farm management @ Rs. 200 per mensem . . . | 2,400 | 0 | 0 |
| Total . . . | 39,560 | 0 | 0 |
| P. Inferior Staff :— | | | |
| (1) Lab. bearer, one, @ Rs. 15 per mensem . . . | 180 | 0 | 0 |
| (2) Lab. boys, 2 @ Rs. 12 per mensem . . . | 288 | 0 | 0 |
| (3) Field boys, 2 @ Rs. 12 per mensem . . . | 288 | 0 | 0 |
| (4) Fieldman, one, @ Rs. 25 per mensem . . . | 300 | 0 | 0 |
| (5) Expert Mali for Green house, etc., one @ Rs. 30 . . . | 360 | 0 | 0 |
| (6) Mechanic for pumping station, one @ Rs. 30 per mensem . . . | 360 | 0 | 0 |
| (7) Bullockmen for feeding the bullocks, three, Rs. 15 per mensem . . . | 540 | 0 | 0 |
| (8) Chankidars for the experimental plot for day and night duties, two, Rs. 15 per mensem . . . | 360 | 0 | 0 |
| (9) Temporary labourers on average scale of four men a day, @ Rs. 12 per mensem . . . | 576 | 0 | 0 |
| Total . . . | 3,152 | 0 | 0 |
| Grand Total of recurring expenditure . . . | 61,277 | 0 | 0 |

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Summary.

| | | | Rs. | A. | P. |
|---|----|----|----------|----|----|
| 1. Contribution of the Hindu University | .. | .. | 8,20,000 | 0 | 0 |
| 2. Grant required from the Imperial Council of Agricultural Research— | | | | | |
| (a) Non-Recurring | .. | .. | 4,18,184 | 0 | 0 |
| (b) Recurring | .. | .. | 61,277 | 0 | 0 |

ANNEXURE C.

Problems for Investigation : The Outlook and the Mode of Attack.

The improvement in the quality and quantity of the yield of some of the most important Indian crops will be our objective.

Out of the various economic crops we wish to concentrate our attention, for the present, on a careful and thorough study of the following crops :—

- (1) Sugar-Cane : The analysis of the factors (specially temperature, water requirements, soil aeration, development of root system in relation to the soil) determining the storage of sucrose in the cane and the ripening of sugar cane, *i.e.*, the attainment of a high sucrose content and juice purity.
- (2) Oil Seeds : The analysis of factors determining the formation of oils in the seeds at critical periods of their growth, leading to high yield.
- (3) Wheat : The analysis of the factors determining the yield, high grain quality with good milling and baking properties.
- (4) Cotton : The analysis of factors determining high yield and quality of fibre, and the shedding of bolls.

The economic importance of any contribution to our knowledge of the development of the above crops needs no comment as even a partial failure of these crops becomes a national calamity.

Two important aspects of the question have to be explored. The first is an adequate realisation of the working condition of the cultivator so that proposals for his benefit may be available from his point of view. The second is the need of a critical study of the problems on an experimental basis.

The first can be satisfied by *personal* experience of the rural area and its agricultural practice as also from the voluminous literature made available by the agricultural departments. To satisfy the second condition is the object of the present scheme.

The aspects of the problems that we wish to attack with respect to the above crops may be stated to be :—

- (1) The improvement of varieties.
- (2) Providing methods and finding means by rigorous experimentation for a successful cultivation of these varieties under various soil and climatic conditions, in order to get the maximum possible yield in quality and quantity with the minimum of cost and with methods simple enough to be used by the ordinary cultivator.

It is intended to begin the work with genetics. But the pronounced deterioration and the culminating catastrophic failure of the already fixed varieties call for a transition into the field of physiology to search in to the "How" and "In what manner". A routine amassing of data for Mendelian analysis will be taken up as a supplementary programme to the physiological inquiries held, since isolated genetical studies have failed to give a clue to the components themselves. The genetical and physiological aspects have to be harmonised to yield results of practical application.

It is hardly possible to lay one's finger on the *limiting factor or factors* of crop production by detached experimentation under the varying stress of conditions obtaining in nature, unless work in the field is carried on simultaneously under controlled conditions and a knowledge of the precise effect of individual conditioning factors and their interaction is available. Then and then alone, is it possible to make good the deficit wherever it lies.

It is, therefore, proposed to subject to a critical study the machinery of the above plants in general, beginning from the in-take of raw materials through root hairs in the shape of mineral solutions and through the green organs (in

the shape of gases) to their final elaboration in the leaf as reserve material. The upward movement of the mineral solution, the nature and magnitude of the forces concerned in the rise, the distribution of the solutions in various organs in time and space will be traced next. A study of the chemical and biological processes occurring in the soil, in their relation to the absorption of mineral nutrients by the root hairs, will be undertaken with a view to their adaptation to practical ends.

Our further step will be to follow the ingress and egress of carbon-dioxide and oxygen till the former reaches the green corpuscles and is worked up to the different classes of materials by means of *specific* energy focussed from the sun.

Another problem will be tracing the physical-chemical reactions that follow the upgrade metabolism of carbo-hydrates, nitrogens, and fats depending upon the specific nature and the developmental stage of the plant.

How the translocation of the elaborated compounds is effected to the storage organs and other seats of activities, and the forces governing such transference will be our next enquiry.

Successful agriculture means the maximum possibilities of plant growth. We will endeavour to understand the mechanism of growth by a quantitative analysis of its magnitude at successive phases of the life-cycle of the plant, estimating that magnitude in terms of other cell activities which are believed to be contributory. We then propose to trace the graded intensity of the reactions accompanying diverse growth phenomena under differential conditions of external as well as internal factors.

Having thus gained an insight into the cell activities and the conditioning factors thereof, it is intended to subject the plant machinery to such chemical and physical stimuli at critical stages as to induce the maximum yield.

Another important inquiry will be tracing the release of energy through the breakdown of elaborated food materials, with special reference to the age of the plant, its developmental stage, the season in which it is growing, and the internal state of the protoplasm, for building up *its own body* and for the *subsequent manufacture of reserve food materials* generally stored in the seed for the use of the next generation. In order to get the maximum output of the plant machinery it is essential that the growth potential of the young plant during the early stages be so accelerated as to subsequently induce enhanced efficiency for building up its own body. We wish, therefore, to lay more stress on the early phase of the plant life when it is embarking on its life journey. After all growth depends upon the "initial capital". It is not however, 'the initial capital alone that will determine the subsequent growth potential', but the *way* in which the "ball of capital" is set rolling and the subsequent *rate* of its progression in the shape of division of undifferentiated meristematic tissue.

We would then investigate the energy relations of the growing plant in its *dynamical* aspect, the attempt being to estimate the efficiency of different crop plants in utilising and transforming solar energy for work of different kinds throughout the life-cycle. Apart from the proportion of energy expended during the upgrade processes, its expenditure in keeping up the "water balance" of the plant will be thoroughly investigated for a real insight into the "water requirements" of crop plants. In short, we propose to prepare a complete *energy balance-sheet* for the whole plant under various conditions for improving the final yield. We further wish to determine the total amount of solar radiation falling on a cultivated area and the amount utilised by different kinds of crops for the production of the final yield.

As a practical measure, the results obtained after this long and continued enquiry, will be used for provoking new vital characters in the plant in order to have *more rapid photosynthesis* and to produce material of *high calorific value relatively rapidly*.

ANNEXURE D.

CONTRIBUTIONS FROM THE PLANT PHYSIOLOGY SECTION.

*Benares Hindu University.**I. The Growth of the Cotton Plant in India.*

- (1) Inamdar, R. S., Singh, S. B., and Paude, T. D. "The Relative Growth-Rates during Successive Periods of Growth and the Relation between Growth-rate and Respiratory Index throughout the lifecycle, *Ann. of Bot.*, Vol. XXXIX, No. CLIV, April, 1925."
- (2) Inamdar, R. S. and Singh, B. N. "The predetermination of Subsequent Growth Variability and variation in the Growth Resistance Potential at the early Seedling Phase and its explanation in terms of External Factors (temperature) and internal conditions (Hydration of growing tissues) *Proc. Seventeenth Ind. Sc. Cong., Agricultural Sec. Allahabad, 1930.*"
- (3) Inamdar, R. S. and Singh, B. N. "The relation of Reproductive Growth to Vegetative Growth as judged by the Growth Curves in *Dhalia neglectum*: The Physiological significance of maximal humps in Growth-rate Curves antecedent to successive initiation of Reproductive Growth, *Proc. Seventeenth Ind. Sc. Cong. Agricultural Sec. Allahabad, 1930.*"
- (4) Inamdar, R. S. and Singh, B. N. "The Interpretation of varietal variability of Growth in *Gossypium herbaceum* as compared with that of *Dhalia neglectum*, *Proc. Seventeenth Ind. Sc. Cong., Agricultural Sec. Allahabad, 1930.*"
- (5) Singh, B. N. "The Causal Factors at work in the shedding of Flowers and Bolls (which determine the final yield in Cotton) in terms of the conceptions of Dynamic Equilibria in the Co-ordinated Growth activity of the entire organism in successive phases of Growth, *Proc. Seventeenth Ind. Sc. Cong., Agricultural Sec. Allahabad, 1930.*"
- (6) Inamdar, R. S. and Singh, B. N. "Growth Energetics of the Mustard Plant. (unpublished) 1926."

II. Studies in Growth, Senescence and Rejuvenescence in Plants.

- (7) Singh, B. N. "The Metabolic Basis of Growth, Senescence and Rejuvenescence in Plants, Thesis accepted for the Degree of Doctor of Science, B. H. U., 1927."

- (8) Singh, B. N. "A comparative study of the Respiratory Index, Water-Content, and the Rate of Healing of Mechanical Wounds in *Hibiscus esculentus*, Journ. Ind. Bot. Soc. 7, pp. 17-21, 1928."
- (9) Singh, B. N. "On the Intrinsic Potentiality of Growth: Ontogenetic Drifts in the Respiratory Index of the Meristematic Tissues in a population of Crop Plants: Hydration Factor in Respiration and Growth. Proc. Ind. Sc. Cong., Allahabad, 1930."
- (10) Singh, B. N. "Studies in the Growth of Annual Plants as measured by the external organal dimensions (unpublished), 1927."
- (11) Singh, B. N. "The Behaviour of the Aerobic and Anaerobic Respirations and their Ratio throughout the Ontogeny of Foliage leaves of the Mustard Plant, with Special reference to Growth (unpublished), 1926."
- (12) Singh, B. N. and V. V. Apte .. "A Comparative Study of the Growth Rates and Respiration throughout the Life-cycle of the Radish Plant during successive periods of Growth in relation to Leaf-area and Leaf-weight Ratio Proc. Fourteenth Ind. Sc. Cong., Lahore, 1927."
- (13) Singh, B. N. and V. V. Apte .. "Seasonal variations in the Growth Rate and Respiration in relation to Leaf-area and Leaf-weight Ratios throughout the Life-cycle of the Radish Plant Proc. Fourteenth Ind. Sc. Cong., Lahore, 1927."
- (14) Kumar, K. "The Relative Distribution of Growth and Growth Materials in the whole Plant and its parts at successive Stages of Growth in the Long Beans. Proc. Seventeenth Ind. Sc. Cong., Allahabad, 1930."
- (15) Shrivastava, A. L. "The Factors Concerned in the Relative Sizes attained by the Shoot and the Root in Herbaceous Plants. Proc. Seventeenth Ind. Sc. Cong., Allahabad, 1930."
- III. Determination of Seed Potentiality Leading to Subsequent Growth and Yield in Crop Plants.*
- (16) Inamdar, R. S. and Singh, B. N. "Effect of previous Temperature on the respiration of Germinating wheat grains Proc. Twelfth Ind. Sc. Cong., Benares, 1925."
- (17) Singh, B. N. and Kumar, K. .. "The Influence of the Size and weight of the seed on the Growth Potential and the Final Yield as applied to Agriculture, Proc. Seventeenth Ind. Sc. Cong., Allahabad, 1930."

IV. *Studies in the Storage of Fruits in India.*

- (18) Singh, B. N. "The Mechanism of Respiration in Fleshy Plant Organs which offer great Organisational Resistance to the Exchange of gases, and store a large stock of Carbohydrate reserves; An analysis of the Respiratory Drift in Air and Nitrogen and their Ratios $\Delta n/\Delta A$ at different temperatures, as also the 'Air-Nitrogen' and 'Nitrogen-Air', After-effects in Oranges, Proc. Seventeenth Ind. Sc. Cong., Bot. Sec., Allahabad, 1930."
- (19) Singh, B. N. "The Mechanism of Respiration in Fleshy Plant Organs which offer great Organisational Resistance to the Exchange of Gases, and store a large stock of carbohydrate Reserves: Localisation of a shift in the working of the Respiratory system with the march of Age in Kuol Kohl Tubers, Proc. Seventeenth Ind. Sc. Cong., Bot. Sec., Allahabad, 1930."
- (20) Singh, B. N. "Proposal of a Scheme for the Dynamic Systems involved in the Respiration of Oranges and Kuol Kohl Tubers, Proc. Ind. Sc. Cong., Bot. Sec., Allahabad, 1930."
- (21) Singh, B. N. "Studies on the Effect of Previous Temperature on the Rates of Respiration in Green Lemons 1926. (To be communicated)."

V. *Water Balance in Tropical Plants.*

- (22) Inamdar, R. S. "The Water Balance in Different Stages of Growth in the Mustard Plant. Proc. Ind. Sc. Cong., Bot. Sec., Allahabad, 1930."
- (23) Inamdar, R. S. and Singh, B. N. "Hourly variations in the water-content of the Rapidly Transpiring Leaves of Jasmine during the Summer months Proc. Twelfth Ind. Sc. Cong., Bot. Sec., Benares, 1925."
- (24) Singh, B. N. "On the use of the Bates Evaporimeter, and Evaporimeters in general in Studies on Plant Transpiration, especially in the open air. Journ. Ind. Bot. Soc. pp. 149-170, 1924. Bot. Gaz. Vol. 79, pp. 343-344, 1925; Bot. Abstracts. 6193, number VII July 1925; Physiological Abstracts Vol. X Number 10, pp. 551-552, 1926; Botanische Centralblatt, 1925."

- (25) Inamdar, R. S. and Shrivastava A. L. "Seasonal Variations in Specific Conductivity of Wood in Tropical Plants with reference to Leaf-fall, Bot. Gaz. Vol. LXXXIII, No. 1, March, 1927."
- (26) ----- "The Relation between the Specific Conductivity and the Structure of the Wood Elements in the Tropical Plants Journ. Ind. Bot. Soc., Vol. IV, Nos. 9 and 20, 1925."
- (27) Inamdar, R. S. and Verma, S. S. "Seasonal Variation in the Transpiring Power and the Specific Conductivity in *Eugenia Jambolana*, Proc. Twelfth Ind. Sc. Congress, Benares, 1925."
- (28) Inamdar, R. S. and Dabral, B.M. "The Daily Equivalence of Transpiratory Loss of water under varying Intensities of Atmospheric Conditions, Proc. Seventeenth Ind. Sc., Cong., Bot., Sec., Allahabad, 1930."
- (29) Singh, B. N. and Sundame, M.M. "The Meaning of Xerophylly in Plants, 1929, (to be communicated)."

VI. Assimilation.

- (30) Inamdar, R. S. and Kumar, K. "The Absorption of CO_2 by Potash Solution with reference to the Relation of Assimilation to CO_2 concentration, Proc. Thirteenth Ind. Sc. Congress, Bot. Sec. Bombay, 1926."

VII. Assimilation of Carbon.

- (31) Inamdar, R. S. "Optima and Limiting factors in Assimilation of Leaves, Proc. Ind. Sc. Cong., Lucknow."
- (32) Singh, B. N. and Kumar, K. "Ontogenetic Drifts in the Photosynthetic Activity of the Foliage Leaves of the Radish Plant, Proc. Fourteenth Ind. Sc. Cong., Bot. Sec., 1927, Lahore."
- (33) Singh, B. N. and Trivedi, R. "What is the First Sugar Formed during Photosynthesis?, (to be communicated), 1927."

VIII. Studies in the Respiration of Tropical Plants.

- (34) Inamdar, R. S. and Singh, B. N. "Seasonal Variations in Aerobic and Anaerobic Respiration in the Leaves of *Artocarpus integrifolia*, Journ. Ind. Bot. Soc. Vol. VI, No. 3 and 4, 1927, pp. 133-219, Proc. Thirteenth Ind. Sc. Congress, Bombay, 1926."
- (35) Singh, B. N. "Studies in the Mechanism of Respiration in plants, Thesis accepted for the D. Sc. degree, B. H. U. 1927."
- (36) Inamdar, R. S. and Singh, B. N. "Effect of Temperature on Aerobic and Anaerobic Respirations and their ratios in the Leaves of *Eugenia jambolana*, Proc. Twelfth Ind. Sc. Congress, Bangalore, 1924."

- (37) Inamdar, R. S. and Singh, B. N. "Effect of Temperature on the ratio of the Rates of Aerobic and Anaerobic Respirations in the Leaves of *Artocarpus Integrifolia*, Proc. Eleventh Ind. Se. Cong., Bot. Sec., Bangalore, 1924."
- (38) Singh, B. N. "A search into the Nature of the Sugar Substratae in Respiration: Effect of different Sugars on Respiration of the *Artocarpus integrifolia* leaves, Proc. Seventeenth Ind. Se. Cong., Bot. Sec., 1930, Allahabad."
- (39) Singh, B. N. "Effect of Chemical Stimuli on Respiration, unpublished, 1926."
- (40) Singh, B. N. and Varadpande, K. V. "Effect of Injecting Water, Glucose and Phosphates on a Failing System of Respiration in the *Artocarpus Integrifolia* leaves, and its Significance on the Mechanism of Respiration, Proc., Seventeenth Ind. Se. Cong., Bot. Sec., Allahabad, 1930."
- (41) Inamdar, R. S. and Varadpande, K. V. "A Glucose Effect on the Permeability of Cell Membrane to Sugar Molecules, Journ. Ind. Bot. Sec. Vol. VIII, No. 3, Nov. 1929; Proc. Ind. Se. Cong., Bot. Sec. Allahabad, 1930."

IX. *Researches on the Chemistry and Physiology of Tropical Plants.*

- (42) Singh, B. N., Singh, B. and Singh, T. S. N. "A Critical Study of the Carbohydrate Analysis in Plant Organs, Proc. Fourteenth Ind. Se. Cong., Bot. Sec., Lahore, 1927."
- (43) —————, .. "The Role of the Carbohydrate-Nitrogen Balance throughout the Ontogeny of the Radish Plant, Proc. Fourteenth Ind. Se. Cong., Botany Sec., Lahore, 1927."

X. *Analytic Studies on the Transport of Carbohydrates in Plants of Economic Importance.*

- (44) Singh, B. N., Singh, B., and Singh, T. S. N. "Transport of the Carbohydrate Substances in the *Artocarpus integrifolia*. Plant in different seasons and under varying stresses, 1927, to be communicated."

XI. *Analytic Studies on the Transport of Nitrogenous Substances in Plants of Economic Importance.*

- (45) Singh, B. N. Prasad, K. and Pande, R. N. "Analytical Studies into the Dynamics of Carbohydrate-Nitrogen Flux in the Vegetative and Reproductive Organs of *Artocarpus integrifolia*, Proc. Ind. Se. Cong., Bot. Sec. 1930 Allahabad."

XII. *General Physiology, Addresses, Reviews and Comments.*

- (46) Inanidar, R. S. "The Auto-Regulation of Physiological Processes in Plants, Presidential Address, Botany Sec. Twelfth Ind. Se. Cong., Benares, 1925."
- (47) —————, "The Law of Constants and the Law of Product in Physiology, Journ. Ind. Bot. Sec. Nov., 1924."
- (48) —————, "Linkage in Sweet Peas, a Review of Prof. Punnet's Article on the subject, Journ. Ind. Bot. Soc., 1924."
- (49) —————, "The Functional Decay of Leaves: R. H. Dastur: A few critical remarks, Journ. Ind. Bot. Soc., Vol. IV, Nos. 9 and 10, 1925."
- (50) —————, "The Age of the Earth, Presidential Address, Scientific Society, Benares Hindu University, B. H. U. Magazine, 1929."

XIII. *Ecology and Plant Growth.*

- (51) Shrivastava, A. L. "Ecology of the Flora of Benares, Pt. I. Proc. Seventeenth Ind. Sc. Cong., Allahabad, 1930."

ANNEXURE E.

List of Scholars who have taken the Degrees of Doctor of Science and of Master of Science from the Benares Hindu University.

DOCTOR OF SCIENCE.

| Name. | Placed in Division. | Year of taking the degree. | How employed. |
|----------------------------------|---------------------|----------------------------|--|
| 1. Dr. B. N. Singh, M.Sc., D.Sc. | .. | 1926 | Asst. Professor of Plant Physiology, Benares Hindu University. |

MASTER OF SCIENCE.

| | | | |
|------------------------------------|--------|------|--|
| 1. Mr. C. Krishnamurty, M.Sc. | .. III | 1921 | Asst. Professor of Botany, St. John's College, Agra. |
| 2. The late Mr. H. C. Ahuja, M.Sc. | .. II | 1921 | Late Asst. Professor of Botany, Benares Hindu University. |
| 3. Mr. R. K. Sakseena, M.Sc. | .. II | 1922 | Lecturer in Botany, University of Allahabad. |
| 4. Mr. S. Ranjan, M.Sc. .. | .. II | 1923 | Reader in Botany, University of Allahabad. |
| 5. Mr. R. Ahmad, M.Sc. .. | .. I | 1923 | Lecturer in Botany, Aligarh University. |
| 6. Mr. S. P. Naithani, M.Sc. | .. III | 1923 | Demonstrator in Botany, University of Allahabad. |
| 7. Dr. B. N. Singh, M.Sc., D.Sc. | .. I | 1924 | Asst. Professor of Plant Physiology, Benares Hindu University. |
| 8. Dr. S. B. Singh, M.Sc., Ph.D. | .. I | 1924 | Assistant Deputy Director of Agriculture, U. P. |
| 9. Mr. B. M. Dabral, M.Sc. | .. I | 1924 | Physiological Botanist, Agricultural Research Station, Sakrand (Sindh). |
| 10. Mr. Akshaihar Lal, M.Sc. | .. II | 1924 | Demonstrator in Botany, Benares Hindu University, Formerly Demonstrator in Botany, Allahabad University. |
| 11. Mr. T. D. Pandey, M.Sc. | .. II | 1924 | Accountant General's Office, Allahabad, formerly Demonstrator in Botany, Benares Hindu University. |
| 12. Mr. S. Varma, M.Sc. .. | .. II | 1925 | Research Scholar, Indian Central Cotton Committee. |
| 13. Mr. Krishna Kumar, M.Sc. | .. II | 1925 | Demonstrator in Botany, Benares Hindu University. |
| 14. Mr. S. S. Rane, M.Sc. | .. II | 1926 | Research Scholar, Indian Central Cotton Committee, Indore. |

15. Mr. K. V. Varadpandey, M.Sc. .. I 1927 Assistant Professor of Botany,
Science College, Nagpore.
16. Mr. Balwant Singh, M.Sc. .. II 1927 Lecturer in Medicinal Botany,
Benares Hindu University.
17. Mr. V. V. Apte, M.Sc. .. II 1927 Assistant Professor of Botany,
Royal Institute of Science,
Bombay.
18. Mr. T. S. N. Singh, B.Sc. .. 1927 Sugarcane Assistant, Sugar-
cane Research Station, Coim-
batore.
19. Mr. M. M. Sudame, M.Sc. .. III 1929 Asst. Professor of Biology,
Hislop College, Nagpur.
20. Mr. S. S. Raina, M.Sc. .. II 1929 Asst. Professor of Biology,
Jammu College, Srinagar,
Kashmere.
21. Mr. Ram Agyan Trivedi, M.Sc. .. III 1929 Candidate for the Bihar and
Orissa Agricultural Service.

NON-RECURRING.

ANNEXURE F.

ADDITIONAL RESEARCH APPARATUS.

(i) Seed Testing and Germination.

| Articles. | No. | Price. |
|---|-----|-----------|
| | | Rs. a. p. |
| Incubator for seed testing | 1 | 460 0 0 |
| Germinators | 1 | 275 0 0 |
| Seed Germinating Apparatus | 1 | 50 0 0 |
| Dephanoscope | 1 | 185 0 0 |
| Open Sampler | 1 | 50 0 0 |
| Apparatus for measuring single seeds | 1 | 100 0 0 |
| Filter papers for germination | 1 | 20 0 0 |
| Wooden germinating boxes | .. | 100 0 0 |
| Culture bottles complete with aerating device of various sizes | .. | 600 0 0 |
| Total | | 1,850 0 0 |

(ii) Assimilation.

| | | |
|---|--------|-----------|
| Sand Time Glasses | 3 | 45 0 0 |
| Hasse's, apparatus for determination of CO_2 in air | 2 | 12 0 0 |
| Jolly's apparatus for determination of O_2 in air | .. | 80 0 0 |
| Aeroplane cloth for field assimilation and respiration experiments | .. | 50 0 0 |
| Blackman's commutators both (for field and laboratory work) | 2 | 650 0 0 |
| Compensation balance with self-recorder | .. | 575 0 0 |
| Pettenkoffer tubes | 6 doz. | 216 0 0 |
| Aspirator, copper, 80 litres cap. | 4 | 600 0 0 |
| Air catchers for aspirator | 2 " | 60 0 0 |
| Droppers | 1 " | 36 0 0 |
| Special calcium chloride bulbs | 2 " | 75 0 0 |
| Special electric clock | 1 | 500 0 0 |
| Assimilation chambers both for Lab. and field of various sizes | 1 doz. | 200 0 0 |
| Electric lamps of high intensity with holders | 6 | 100 0 0 |
| Electric pump to supply gas at high pressure in assimilation experiments | 1 | 300 0 0 |
| Titration gasometer | 1 | 50 0 0 |
| Special stock solution bottles for KOH, Ba (OH^2) Hcl and water | 8 | 800 0 0 |
| Potash towers | 6 | 120 0 0 |
| Potash absorption apparatus | 1 | 100 0 0 |
| Glass filter for absorbing heat rays | 2 | 200 0 0 |
| Marble tower for generating CO_2 | 6 | 120 0 0 |
| Warburg's apparatus for assimilation as modified by Haldane and Barcroft | 1 | 100 0 0 |
| Spöhr's automatic assimilation apparatus | 1 | 600 0 0 |
| Reisert's apparatus for absorption of CO_2 under field conditions | 2 | 200 0 0 |
| Pipette droppers | 2 doz. | 24 0 0 |
| Aspirator droppers | 2 " | 24 0 0 |
| Total | | 5,637 0 0 |

(iii) Respiration.

| Articles. | No. | Price. | | |
|---|-----|--------|----|----|
| | | Rs. | a. | p. |
| Mercury air pump for gas analysis in respiration | .. | 330 | 0 | 0 |
| Auto-Co ₂ recorder | .. | 600 | 0 | 0 |
| Apparatus for circulating gas in a closed system | .. | 15 | 0 | 0 |
| Bonnier and Mangin apparatus for respiration experiments | .. | 225 | 0 | 0 |
| Extra graduated tubes for above | 2 | 200 | 0 | 0 |
| Winkler's gas absorption apparatus | 3 | 51 | 0 | 0 |
| Cambridge portable micro Co ₂ testing apparatus | 1 | 64 | 0 | 0 |
| Purisvuis apparatus for determining respiratory co-efficient with extra burette | 1 | 77 | 0 | 0 |
| Hempel's burette with platinum termini for directly determining the respiratory co-efficient, complete with holders, etc. | 2 | 150 | 0 | 0 |
| Berzelius Gas holder for supplying different percentage of O ₂ | 2 | 200 | 0 | 0 |
| Total | .. | 1,912 | 0 | 0 |

(iv) Water Balance.

| | | | | |
|---|---------|-------|----|----|
| Special Apparatus for determining Evaporation of water from leaves, evaporimeters and soil under field conditions | 1 | 700 | 0 | 0 |
| Automatic and Continuous recording balance for studies on evaporation, transpiration, sedimentation, flocculation, etc. | 1 | 2,700 | 0 | 0 |
| Differential balance for evaporation and transpiration (Macdougall type) | 1 | 275 | 0 | 0 |
| Metal pots for transpiration, different sizes (to be specially prepared) | 2 doz. | 500 | 0 | 0 |
| Stone ware soil containers for work on transpiration (of Briggs and Shantze's type, to be specially prepared) | 2 " | 500 | 0 | 0 |
| Automatic platform balances (self-recording for transpiration experiments) | 6 | 3,600 | 0 | 0 |
| Special incubator for transpiration experiments under controlled conditions | 1 | 12 | 0 | 0 |
| Platicine (see chemicals) | 20 lbs. | .. | .. | .. |
| Atmometer, Livingston's type | .. | 50 | 0 | 0 |
| Special glass plates and brass screws for Chobalt chloride papers, in transpiration experiments | 4 doz. | 150 | 0 | 0 |
| Graduated twig containers | 2 " | 120 | 0 | 0 |
| Special wood and saw dust incubators for pots (to be locally prepared) | 1 | 300 | 0 | 0 |
| Special appliance to find out internal temp. of plant organs for energy relation experiments | .. | 3,000 | 0 | 0 |

| Articles. | No. | Price. | | |
|--|-----|--------|----|----|
| | | Rs. | a. | p. |
| Prometer with self-recording device complete for measuring stomatal opening .. | 1 | 270 | 0 | 0 |
| Electric fan for transpiration experiments | 2 | 234 | 0 | 0 |
| Apparatus for specific conductivity of wood, complete | 1 | 415 | 0 | 0 |
| Apparatus to determine wilting co-efficient complete with motor.. .. . | 1 | 200 | 0 | 0 |
| Barnetzky's apparatus for automatic registration of cell sap | 1 | 225 | 0 | 0 |
| Total | .. | 14,439 | 0 | 0 |

(v) Growth.

| | | | | |
|--|---------------------------------------|-------|---|---|
| Auxograph to record variations in thickness of leaf under definite conditions .. | .. | 225 | 0 | 0 |
| Auxograph for recording thickness of vegetative organs | .. | 178 | 0 | 0 |
| Auxograph for measurement of length | .. | 250 | 0 | 0 |
| Culture vessels of various sizes | .. | 600 | 0 | 0 |
| Green house for experiment on growth | } Refer to experimental Farm Section. | | | |
| Hot House | | | | |
| Experimental Farm | | | | |
| Total | .. | 1,253 | 0 | 0 |

(vi) Soil Analysis.

| | | | | |
|--|--------|-------|---|---|
| Soil Sampler | 3 | 35 | 0 | 0 |
| Heavy iron collar for driving, for above .. | 3 | 7 | 6 | 0 |
| Soil saps tins, Cap— | | | | |
| 20z. | 3 doz. | 10 | 6 | 0 |
| 40z. | 3 " | 11 | 8 | 0 |
| 80z. | 3 " | 12 | 0 | 0 |
| Carrying tins, to take 24 tins, 4 sizes each .. | 1 | 32 | 0 | 0 |
| Earth borer, Frankels' pattern, for taking samples of earth from a depth 2 meters long | 3 | 150 | 0 | 0 |
| Sieves, brass standard mesh | 1 set | 160 | 0 | 0 |
| Sieves, for soil analysis of 6" diam. .. | 1 " | 200 | 0 | 0 |
| Wagener's shaking apparatus for the estimation of phosphoric acid with motor .. | 1 | 530 | 0 | 0 |
| Shaking machine for sieves | 1 | 450 | 0 | 0 |
| Jars with spout for sedimentation test different cap. | 1 doz. | 30 | 0 | 0 |
| Ditto graduated | 1 " | 68 | 0 | 0 |
| Centrifuge for determining moisture equivalents | 1 | 1,050 | 0 | 0 |
| Automatic and continuous recording balance | 1 | 2,525 | 0 | 0 |
| Earth Thermometer, Syman's pattern .. | 1 | 550 | 0 | 0 |
| Apparatus for measuring the pH of solid complete | 1 | 1,125 | 0 | 0 |
| Hot bed thermometers | 6 | 60 | 0 | 0 |

| Articles. | No. | Price. | | |
|---|----------|--------|----|----|
| | | Rs. | a. | p. |
| Heat absorption apparatus | 1 | 40 | 0 | 0 |
| Heat conductivity apparatus | 1 | 75 | 0 | 0 |
| Soil Boxes | 12 | 85 | 0 | 0 |
| Soil aspirator | 1 | 40 | 0 | 0 |
| Heinrich's apparatus for determining permeability in open field | 1 | 40 | 0 | 0 |
| Apparatus for estimating the capillary action of soil | 1 | 125 | 0 | 0 |
| Spare tubes set of | 10 | 120 | 0 | 0 |
| Apparatus for collecting soil air | 1 | 80 | 0 | 0 |
| Mortar with wooden pestle | 3 | 10 | 0 | 0 |
| Whatman's filter paper No. 1 in packets of 100 | 12 pkts. | 24 | 0 | 0 |
| Stoppered measuring cylinder liter cap. | 1 | 32 | 0 | 0 |
| Pipette 20ml. with cylinder stem and cork to fit the neck of cylinder | 12 | 30 | 0 | 0 |
| Vitr. dish. | 1 doz. | 40 | 0 | 0 |
| Muffle furnace, gas heated | 1 | 120 | 0 | 0 |
| Rubber pestle | 2 | 17 | 0 | 0 |
| Wegners sedimentation tube | 1 | 42 | 0 | 0 |
| Soil washing apparatus | 1 | 64 | 0 | 0 |
| Hall and Russel carbonate determination apparatus | 1 | 60 | 0 | 0 |
| Mathews app. for ammonia determination .. | 1 | 75 | 0 | 0 |
| Sharples super centrifuge for colloid investigation | 1 | 30 | 0 | 0 |
| Apparatus for measuring changes in soil vol. | 1 | 60 | 0 | 0 |
| Evaporimeter | 1 | 48 | 0 | 0 |
| Haldans apparatus | 1 set | 150 | 0 | 0 |
| Mineral analysis soluble salt content electrical conductivity apparatus (See special app.) | .. | .. | .. | .. |
| Microscopical examination (See Microscopy) .. | .. | .. | .. | .. |
| Total | .. | 7,362 | 0 | 0 |

(vii) Balances and Weights.

| | | | | |
|--|--------|-----|---|---|
| Balance (ordinary) for the chemical store .. | 1 | 40 | 0 | 0 |
| Balance, analytical | 1 | 300 | 0 | 0 |
| Balance, Sartorius No. 3 for analytical work | 1 | 500 | 0 | 0 |
| Weight box for above | 1 set | 105 | 0 | 0 |
| Weight boxes, Analytical | 2 sets | 100 | 0 | 0 |
| Weight box Ordinary | 1 set | 10 | 0 | 0 |
| Weights, fractional | 3 sets | 15 | 0 | 0 |
| Riders, extra | 5 | 6 | 0 | 0 |
| Pound weight | 1 set | 21 | 0 | 0 |
| Angled dessicators for balances | 12 | 12 | 0 | 0 |
| Spring Balance | 2 | 20 | 0 | 0 |
| Balance, counter cap. 10 lbs. | 1 | 90 | 0 | 0 |

| Articles. | No. | Price | | |
|---|----------------------|--------------|----------|----------|
| | | Rs. | a. | p. |
| Balance, counter with open pans (for assimilation experiments) | 2 | 220 | 0 | 0 |
| Weighing machine to weigh 24 tons | 1 | 150 | 0 | 0 |
| Automatic recording balance for Transpiration and Evaporation experiments of the type used by Briggs and Santz. (see Journ. Agri. Res. Vol. V., No. 14, 1916) | (See transpiration.) | .. | .. | .. |
| Spirit level | 2 | 5 | 0 | 0 |
| Total | | 1,592 | 0 | 0 |

(viii) Electrical Instruments and Other Goods.

| | | | | |
|--|----------|--------------|----------|----------|
| Rheostat and battery charging board complete | 1 | 90 | 0 | 0 |
| Voltmeter 2 range | 2 | 34 | 0 | 0 |
| Ammeter | 2 | 50 | 0 | 0 |
| Sliding rheostat, different range | 6 | 180 | 0 | 0 |
| Terminals and connectors, various types .. | 6 | 38 | 0 | 0 |
| Electrical wires thin insulated bobbins (copper) | 6 | 42 | 0 | 0 |
| German silver | 2 | 30 | 0 | 0 |
| Flexible wires | 200 yds. | 70 | 0 | 0 |
| Universal switch with sliding rheostat 25 to 5 amps. for experimental work | 1 | 225 | 0 | 0 |
| Set of Daniells cells of six | 1 set | 50 | 0 | 0 |
| Accumulators of 6 volts | 6 | 900 | 0 | 0 |
| Simens Inert dry cells | 1 doz. | 5 | 0 | 0 |
| Airtite | 6 | 9 | 0 | 0 |
| Electrometric titration app. complete | 1 | 1,020 | 0 | 0 |
| Weston standard cell | 1 | 200 | 0 | 0 |
| Thermo-couples, rare metal and other types with small range recording outfit | 1 set | 750 | 0 | 0 |
| Triple Range Voltmeter | 1 | 150 | 0 | 0 |
| Mirror galvanometer | 1 | 300 | 0 | 0 |
| Galvanometer lamp and Scale | 1 | 80 | 0 | 0 |
| Commutators | 6 | 150 | 0 | 0 |
| Electric temperature regulator complete | 1 | 250 | 0 | 0 |
| Eudiometer | 1 | 30 | 0 | 0 |
| Induction coils | 6 | 300 | 0 | 0 |
| Voltmeter for the electrolysis of solutions | 1 | 37 | 0 | 0 |
| Electrometric chemical analysis apparatus | | .. | .. | .. |
| Resistance Box | 1 | 125 | 0 | 0 |
| Lamp Resistances | 2 | 150 | 0 | 0 |
| Wheatstone Bridge | 1 | 57 | 0 | 0 |
| Ammeter and Voltmeter combined | 1 | 20 | 0 | 0 |
| Total | | 5,289 | 0 | 0 |

(ix) Meteorological Apparatus.

| Articles. | No. | Price. | | |
|---|-----|--------|----|----|
| | | Rs. | a. | p. |
| Self recording rain guage | 1 | 300 | 0 | 0 |
| Maximum and minimum thermometer (six's) | 1 | 15 | 0 | 0 |
| Earth thermometers— | | | | |
| 1 foot | 2 | 54 | 0 | 0 |
| 2 feet | 1 | 32 | 0 | 0 |
| 4 feet | 1 | 35 | 0 | 0 |
| 10 feet | 1 | 45 | 0 | 0 |
| Solar radiation thermometer | 2 | 45 | 0 | 0 |
| Thermo-Hygrograph | 1 | 466 | 0 | 0 |
| Wet and dry bulb thermometer | 2 | 84 | 0 | 0 |
| Horticultural hygrometer.. .. . | 1 | 32 | 0 | 0 |
| Pickering standard evaporimeter | 1 | 36 | 0 | 0 |
| Barometer, standard | 1 | 386 | 0 | 0 |
| Anemometer | 1 | 315 | 0 | 0 |
| Total | | 1,845 | 0 | 0 |

E. (x) Other Miscellaneous Special Research Apparatus for Cell Physiology, Cell Chemistry, Cell Physics, etc.

| | | | | |
|--|--------|-------|---|---|
| Apparatus for the determination of Carbon and Hydrogen, Fritz Pregl pattern .. | 1 | 250 | 0 | 0 |
| Duma's nitrogen determination apparatus .. | 1 | 220 | 0 | 0 |
| Micro Kjeldahl's apparatus | 1 | 40 | 0 | 0 |
| Kjeldahl's apparatus (set of 6) electrically heated | 1 | 300 | 0 | 0 |
| Do. do. single sets | 3 sets | 30 | 0 | 0 |
| Calculating rule | 1 | 20 | 0 | 0 |
| Sliding calliper | 1 | 10 | 0 | 0 |
| Beckman's apparatus for determining osmotic pressure, freezing point .. | 1 | 90 | 0 | 0 |
| Do. do. boiling point.. .. . | 1 | 100 | 0 | 0 |
| Abbes Refractometer for the determination of moisture-content of cell sap and sugar percentage | 1 | 700 | 0 | 0 |
| Schiff's nitrometer | 3 | 55 | 0 | 0 |
| Van Slyke's Amino-nitrogen app. | 1 | 100 | 0 | 0 |
| Schmidt fat extractor | 1 set | 50 | 0 | 0 |
| Extra glass parts | 1 set | 45 | 0 | 0 |
| Van Slyke's Carbon dioxide determination in cell sap | 1 set | 750 | 0 | 0 |
| Folins fume absorber | 4 | 24 | 0 | 0 |
| Bomb Calorimeter for determination of sp. heat in finding energy relationships .. | 1 | 750 | 0 | 0 |
| Comparator, Cole and Onslaw | 3 | 24 | 0 | 0 |
| Polariscopes, Shimidt and Hainch with accessories for sugar estimation | 1 | 2,500 | 0 | 0 |
| Electrical conductivity apparatus | | | | |
| Kohlrauch, universal bridge with accessories | 1 | 450 | 0 | 0 |

| Articles. | No. | Price. | | |
|---|--------|---------------|----------|----------|
| | | Rs. | a. | p. |
| Hally's still for preparing pure distilled water for use in electrical conductivity experiments | 1 | 100 | 0 | 0 |
| Hydrogen-iron concentration outfit | 1 | 1,140 | 0 | 0 |
| Ultra-microscope outfit | 1 | 828 | 0 | 0 |
| Soxhlet-Newton extraction app. for preparing plant tissue for carbohydrate studies | 2 sets | 51 | 0 | 0 |
| Ostwalds pipettes | 1 doz. | 26 | 0 | 0 |
| Apparatus for quantitative determination of catalase | 1 | | | |
| Spectroscope | 1 | 1,240 | 0 | 0 |
| Gas leak indicators | 1 | 75 | 0 | 0 |
| Gas pressure gauge | 1 | 45 | 0 | 0 |
| Simple and compound absorption pipettes (Hemple's) | 12 | 130 | 0 | 0 |
| Hemple's explosion pipette | 2 | 60 | 0 | 0 |
| Hemple's gas Burette special research type | 3 | 200 | 0 | 0 |
| Nitrometer | 1 | 200 | 0 | 0 |
| Gas explosion burettes, special | 3 | 112 | 0 | 0 |
| Gas Holder | 1 | 120 | 0 | 0 |
| Gas holder 10 litre cap. | 2 | 162 | 0 | 0 |
| <i>Gas Cylinders (Compressed)</i> — | | | | |
| Oxygen with cylinders | 6 | 500 | 0 | 0 |
| Nitrogen with cylinders | 6 | 500 | 0 | 0 |
| Carbon dioxide cylinders | 3 | 200 | 0 | 0 |
| Kipp's apparatus | 6 | 150 | 0 | 0 |
| Sulphuretted hydrogen apparatus | 1 | 50 | 0 | 0 |
| Stop watches | 6 | 200 | 0 | 0 |
| Stop clock | 2 | 80 | 0 | 0 |
| Metronomes | 2 | 35 | 0 | 0 |
| Syringe for injecting substances in fleshy plant organs | 1 | 34 | 0 | 0 |
| Paper cutter | 1 | 5 | 0 | 0 |
| Reichert-Wollny apparatus | 2 | 32 | 0 | 0 |
| Polenske's apparatus | 2 | 48 | 0 | 0 |
| Seimens ozone tubes and ozone generator | 1 set | 800 | 0 | 0 |
| Vacuum pump for specific conductivity | 1 | 200 | 0 | 0 |
| Manometers | 2 | 32 | 0 | 0 |
| Soxhlet's extraction special outfit | 1 | 510 | 0 | 0 |
| A set of reagents for spectrum analysis | 1 set | 35 | 0 | 0 |
| Mercury distillation apparatus | 1 | 130 | 0 | 0 |
| Mercury vapour lamps for ultraviolet rays | .. | 260 | 0 | 0 |
| Gelatine's absorption film | .. | 250 | 0 | 0 |
| Ultra-violet light apparatus | .. | 4,000 | 0 | 0 |
| Recording drums | 6 | 810 | 0 | 0 |
| Electro-magnet pens | 2 | 150 | 0 | 0 |
| Glazed paper for drum | 1,000 | 25 | 0 | 0 |
| Total .. | | 13,845 | 0 | 0 |

ANNEXURE G.
ADDITIONAL PHYSIOLOGICAL INSTRUMENTS.
Apparatus for General Equipment.

(1) Workshop Tools.

| Articles. | No. | Price. | | |
|--|---------|--------|----|----|
| | | Rs. | a. | p. |
| Workshop lathe | 1 | 600 | 0 | 0 |
| Workshop drill | 1 | 330 | 0 | 0 |
| Workshop bench | 1 | 90 | 0 | 0 |
| Tool cabinet | 1 | 110 | 0 | 0 |
| Files | 24 | 10 | 0 | 0 |
| Hack saw frames | 2 | 6 | 0 | 0 |
| Pliers | 6 | 15 | 0 | 0 |
| Metal chisels | 12 | 18 | 0 | 0 |
| Screw drivers | 12 | 20 | 0 | 0 |
| Shears for cutting metals | 2 | 5 | 8 | 0 |
| Mallets | 1 | 3 | 0 | 0 |
| Scissors | 3 pairs | 10 | 0 | 0 |
| Anvil | 2 | 22 | 0 | 0 |
| Spanner (adjustable) | 3 | 10 | 0 | 0 |
| Vice (hand) | 1 | 12 | 0 | 0 |
| Vice (strong parallel jaws) | 1 | 20 | 0 | 0 |
| Metal sheets, etc., according to market rates | .. | 100 | 0 | 0 |
| I. R. sheeting cord, window glasses, card boards, clock springs, silk thread, etc. | .. | 50 | 0 | 0 |
| Fletcher's soldering burner (self-fitting) | 1 | 16 | 0 | 0 |
| Breast drill | 1 | 28 | 0 | 0 |
| Brace carpenter with centre bits to suit | 1 | 30 | 0 | 0 |
| Soldering material of different kinds | 1 | 7 | 0 | 0 |
| Stove | 1 | 10 | 0 | 0 |
| Other workshop requirements | .. | 100 | 0 | 0 |
| Total | .. | 1,622 | 8 | 0 |

(2) Glass Blowing Accessories.

| | | | | |
|---|--------|-----|---|---|
| Blow pipes | 6 | 8 | 0 | 0 |
| Blow pipe with 2 stop cocks for glass blowing | 1 | 225 | 0 | 0 |
| Fletcher's chemical analysis set | 1 | 65 | 0 | 0 |
| Blow pipe bellows | 1 | 50 | 0 | 0 |
| Glass blower's tools | 1 set | 15 | 0 | 0 |
| Charcoal blocks | 1 doz. | 1 | 0 | 0 |
| Charcoal borer | 1 | 2 | 0 | 0 |
| Charcoal pastille holders | 1 doz. | 8 | 6 | 0 |
| Platinum wire holders | 6 | 8 | 0 | 0 |
| Charcoal saw | 1 | 1 | 0 | 0 |
| Machine for cutting glass tubings | 1 | 35 | 0 | 0 |
| Diamond pencil | 1 | 16 | 0 | 0 |
| Glass marking pencil | 2 | 4 | 0 | 0 |
| Pencils for writing on glass | 1 doz. | 4 | 0 | 0 |
| Total | .. | 442 | 6 | 0 |

(3) Microscopy and Histology.

| Articles. | No. | Price. |
|---|----------|-----------|
| | | Rs. a. p. |
| Micro warm stage | 1 | 40 0 0 |
| Research Microscope and accessories (im- mersion oil, etc.) | 1 | 1,500 0 0 |
| Micro slide incubator with thermometer .. | 1 | 60 0 0 |
| Camera lucida for microdrawing | 1 | 108 0 0 |
| Ocular micrometer | 1 | 40 0 0 |
| Stage micrometer | 1 | 12 0 0 |
| Micrometer slide | 2 | 70 0 0 |
| Microphotographic Camera without micros- cope (Thomas) | 1 | 1,560 0 0 |
| Drawing Eyepiece | 1 | 10 0 0 |
| Microtome knives | 2 | 60 0 0 |
| Razors | 6 | 18 0 0 |
| Hone and Strops | 3 | 60 0 0 |
| Micro cover slips | .. | 18 0 0 |
| Slide white for research | 10 gross | 30 0 0 |
| Slide noncorrosive | 5 | 30 0 0 |
| Micro-culture slide | 50 | 15 0 0 |
| Labels . Micro | .. | 10 0 0 |
| Slide boxes | .. | 30 0 0 |
| Cover slips 8 oz. | .. | 25 0 0 |
| Cover slips rectangular 3 oz. | .. | 15 0 0 |
| Turn table | 1 | 25 0 0 |
| Pith elders | .. | 12 0 0 |
| Strop for microtome knife | 1 | 25 0 0 |
| Hand lens | .. | 10 0 0 |
| Eyepieces cross line micrometer | 1 | 25 0 0 |
| Paraffin of different melting point | .. | 5 0 0 |
| Chamois leather | .. | 20 0 0 |
| Drawing table | .. | 200 0 0 |
| Bell jars | 2 | 25 0 0 |
| Staining jars | 1 doz. | 90 0 0 |
| Dissecting instrument set | 6 | 8 0 0 |
| Brushes | .. | 9 0 0 |
| Canada balsam bottles | 6 | 3 0 0 |
| India rubber teats | .. | 36 0 0 |
| Drop bottles | 4 doz. | 13 8 0 |
| Cedar wood oil bottle | 6 | 100 0 0 |
| Specimen tubes | 200 | 95 0 0 |
| Paraffin embedding bath | .. | 50 0 0 |
| Wide mouth flat stoppered bottles for keep- ing slides and cover glasses | .. | 100 0 0 |
| Wide mouth bottles for preserving speci- mens | .. | .. |
| Total | .. | 5,122 0 0 |

B. (4) Thermostat, Regulators, Stirrers, Shaft, Motors, Centrifuge, etc.

Thermostat.

| | | |
|--|---|---------|
| Lawry's electric thermostat | 1 | 850 0 0 |
| Thermostats, glass sided | 3 | 525 0 0 |
| Thermostats with 6 volts electric motor and stirrer | 1 | 120 0 0 |

| Articles. | No. | Price. | | |
|---|-----|--------|----|----|
| | | Rs. | a. | p. |
| Gas-regulators Reicherts Muneke | 12 | 185 | 0 | 0 |
| Do. Lawry's | 6 | 105 | 0 | 0 |
| <i>Stirring Apparatus :—</i> | | | | |
| Shaft with motor and belt arrangement to be fitted on physiological working bench 12' long with 4 sets of grooved pulley wheels which can be fitted to any position | 1 | 500 | 0 | 0 |
| Stirring apparatus to be used with the shaft | 4 | 150 | 0 | 0 |
| Shaking apparatus | 1 | 80 | 0 | 0 |
| Motors of different H. P. for physiological work | 2 | 180 | 0 | 0 |
| Hot air motor gas heater | 1 | 200 | 0 | 0 |
| <i>Centrifuges.</i> | | | | |
| Centrifugal machine, Gerber's hand driven .. | 1 | 50 | 0 | 0 |
| Centrifuge, Gerber's electrically driven .. | 1 | 225 | 0 | 0 |
| Extra tubes, trays and corks | .. | 40 | 0 | 0 |
| Electrically driven air pump for determination of specific conductivity of wood .. | .. | 300 | 0 | 0 |
| Total | .. | 3,510 | 0 | 0 |

B. (5) Thermometers and Hydrometers.

| | | | | |
|--|--------|-------|---|---|
| Thermometers, chemical | 3 doz. | 150 | 0 | 0 |
| Thermometers, Standard for Research .. | 3 " | 300 | 0 | 0 |
| Thermometers special high temperature .. | 3 " | 25 | 0 | 0 |
| Beckman's Thermometer | 2 | 30 | 0 | 0 |
| Beckman's Differential Thermometer .. | 1 | 50 | 0 | 0 |
| Thermometer magnifier | 2 | 30 | 0 | 0 |
| Normal Thermometer | 3 | 40 | 0 | 0 |
| Do. Wall | 3 | 12 | 0 | 0 |
| Do. for Refrigerators | 2 | 32 | 0 | 0 |
| Do. Steam | 1 | 25 | 0 | 0 |
| Do. Chemical | 2 | 85 | 0 | 0 |
| Do. Box wood scale | 2 | 15 | 0 | 0 |
| Do. maximum and minimum | 2 | 40 | 0 | 0 |
| Self-recording distance Thermometers .. | 1 | 100 | 0 | 0 |
| Steel-tube mercury dial thermometer .. | 1 | 75 | 0 | 0 |
| Hydrometers (low and high sets) | 2 sets | 125 | 0 | 0 |
| Saccharometers | 5 | 75 | 0 | 0 |
| Spirit Hydrometers | 3 | 35 | 0 | 0 |
| Salinometers | 1 set | 20 | 0 | 0 |
| Total | .. | 1,184 | 0 | 0 |

(6) Brushes, Stands, Tripods, Wire Gauge, Clay Triangles, etc.

| Articles. | No. | Price. | | |
|--|-------------|--------|----|----|
| | | Rs. | a. | p. |
| Test tube brushes | 3 doz. | 3 | 9 | 0 |
| Burette brushes | 6 | 3 | 0 | 0 |
| Brushes with Bristle in the middle with adjustable cleaner | 6 sets | 3 | 8 | 0 |
| Burette Mohrs clips small, medium and large | 4 doz. each | 35 | 0 | 0 |
| Burette stands hard wood | 8 | 24 | 0 | 0 |
| The W. J. Burette stand | 2 | 10 | 0 | 0 |
| Titration set | 1 | 28 | 0 | 0 |
| Test tube holders | 2 doz. | 24 | 0 | 0 |
| Test tube stands | 1 doz. | 36 | 0 | 0 |
| Tripod stands | 3 doz. | 48 | 0 | 0 |
| Wooden supports | 6 | 120 | 0 | 0 |
| Berzelius table support | 12 | 150 | 0 | 0 |
| Retort stands | 48 | 480 | 0 | 0 |
| Retort stand clamps | 72 | 180 | 0 | 0 |
| Retort rings | 24 | 72 | 0 | 0 |
| Boss heads | 24 | 26 | 0 | 0 |
| Bechive shelf | 12 | 25 | 0 | 0 |
| Combined funnel and burette stand | 4 | 24 | 0 | 0 |
| Condenser clamps | 12 | 75 | 0 | 0 |
| Funnel stand | 24 | 125 | 0 | 0 |
| Pipette stand (circular) | 4 | 100 | 0 | 0 |
| Tongs for crucibles | 6 | 36 | 0 | 0 |
| Mercury tong | 1 | 35 | 0 | 0 |
| Wire Gauge | 48 | 50 | 0 | 0 |
| Claypipe triangles | 12 | 17 | 0 | 0 |
| Total | | 1,730 | 1 | 0 |

(7) Furnaces, Burners, Ovens, Dessicators, Evaporating Baths, etc.

| | | | | |
|---|--------|-------|---|---|
| Hot air sterilizer 36 × 30 × 40 in. | 1 | 250 | 0 | 0 |
| Hot air sterilizers big size. To be specially prepared 6' × 30" × 24" with shelves gas heated with temp. capsule for 100 degrees, 35 degrees, 57 degrees | 1 | 1,200 | 0 | 0 |
| Incubator, copper, felt covered. Size 26" × 30" × 24" | 1 | 450 | 0 | 0 |
| Refrigerator | 1 | 875 | 0 | 0 |
| Water Bath copper | 6 | 100 | 0 | 0 |
| Water Bath copper size 3' × 2' × 1' to be specially prepared for holding several flasks at a time for sugar and nitrogen estimation, etc., with stand and lamp complete | 1 | 250 | 0 | 0 |
| Sand Bath | 1 doz. | 2 | 0 | 0 |
| Furnace, Bunsen's with fire clay bricks; for combustion of Oxygen, etc., 24" | 1 | 165 | 0 | 0 |
| Aluminium evaporating Basins | 6 | 18 | 0 | 0 |
| Cast Iron deep evaporating pan cap. 6 gallons | 1 | 30 | 0 | 0 |

| Articles. | No. | Price. |
|---|--------|-----------|
| | | Rs. a. p. |
| Bunsen burner with tube and air regulator of brass 7-16" diam. | 1 doz. | 355 0 0 |
| Fittings for Bunsen Burners 7-16" diam. | 1 set | 10 0 0 |
| | each. | |
| Burner, (Tech Pattern) | 12 | 75 0 0 |
| Fletchers Bunsen safety burner 1½" diam. | 6 | 65 0 0 |
| Fish tail burner | 3 | 10 0 0 |
| Furnace Burner | 6 | 22 0 0 |
| Standard boiling ring Burner 12" diam. | 1 | 30 0 0 |
| Do. 10" " | 2 | 40 0 0 |
| High temperature burner size 3 and 4 | 1 | |
| | each. | 20 0 0 |
| Micro Burners | 6 | 12 0 0 |
| Total | | 3,979 0 0 |

B. (8) Stills and Condensers.

| | | |
|---|--------|---------|
| Condenser, Liebig's | 1 doz. | 80 0 0 |
| Condensers, Liebig's (shortened type) | 3 only | 30 0 0 |
| Condensers Spiral | 3 | 75 0 0 |
| Condensers Allehns | 3 | 30 0 0 |
| Condensers Liebig's (copper body) | 1 | 40 0 0 |
| Mercury purifying apparatus | 1 | 35 0 0 |
| Automatic distillation still by gas | 1 | 245 0 0 |
| Condenser stand | 6 | 100 0 0 |
| Fractional distillation tubes | 2 | 35 0 0 |
| Receiver for fractional distillation | 2 | 65 0 0 |
| Total | | 735 0 0 |

(9) Grinding Mills, Press, Mortar and Pestle.

| | | |
|------------------------------|---|---------|
| Grinding Motor | 1 | 80 0 0 |
| Grinding Chopper | 1 | 65 0 0 |
| Sugar-cane crusher | 1 | 200 0 0 |
| Mortar and Pestle— | | |
| Iron | 2 | 60 0 0 |
| Glass | 3 | 30 0 0 |
| Total | | 435 0 0 |

(10) Rubber Goods and Corks, etc.

| | | |
|---|----------|--------|
| I. R. Tubing best red quality bore 1, 1½, 1¾; 3'16, ½, 5'16, ¾ | 30 each. | 62 0 0 |
| I. R. Tubing best red quality bore ¼, 3/8, ½, 7/8" | 15 " | 60 0 0 |
| I. R. Tubing best red quality bore 1" | 15 " | 45 0 0 |
| I. R. Tubing best red pressure bore— 1 mm. | 10 " | 8 8 0 |

| Articles. | No. | Price. |
|---|-----------------------|------------------|
| | | Rs. a. p. |
| $1/8 \times 3/8, 1/8 \times 1/2, 3/16 \times 1/2, 3/16 \times 5/8$ | .. 45 each | 50 0 0 |
| 5/16 | .. 15 " | 34 0 0 |
| for burners bore $2\frac{1}{4}$ | .. 80 " | 80 0 0 |
| I. R. Corks Bung form 3, $2\frac{1}{4}, 2\frac{1}{2}, 2\frac{3}{4}$ " | .. 18 " | 210 0 0 |
| I. R. Corks Bung form $1\frac{1}{2}, 1\frac{5}{8}, \frac{1}{2}, 1\frac{3}{8}, 1\frac{1}{2}$ " | .. 3 doz. each. | 200 0 0 |
| $1\frac{1}{8}, 1\frac{7}{8}, \frac{3}{4}, 5/8, \frac{1}{2}$ " | .. 3 " | 75 0 0 |
| I. R. Corks long form $3/16, \frac{1}{4}, 3/8, 7/16, \frac{1}{2}, 9/16, 5/8, 11/16, \frac{3}{4}$ " | .. 3 " | 85 0 0 |
| I. R. Corks long form $13/16, 7/8, 1, 1\frac{1}{8}, 13/16, 1\frac{1}{2}, 1\frac{1}{2}, 1\frac{5}{8}, 1\frac{7}{8}, 1, 15/16,$ | .. 1 " | 232 0 0 |
| I. R. Teat | .. 2 doz. | 2 8 0 |
| I. R. Caps. | .. 2 " | 5 0 0 |
| I. R. Caps with lubulures | .. 1 " | 8 0 0 |
| I. R. Tubes | .. 1 " | 8 0 0 |
| I. R. Bands | .. 4 " | 5 0 0 |
| I. R. Sheets | .. 3 boxes. | 9 0 0 |
| I. R. Teats | .. 12 oz. | 6 0 0 |
| I. R. Solution | .. $\frac{1}{2}$ lbs. | 2 8 0 |
| I. R. Charterton compound, in sticks | .. 16 oz. | 10 0 0 |
| I. R. Circles for foot bellows | .. 3 | 9 0 0 |
| I. R. Siring net | .. 2 | 7 0 0 |
| Clips of various types | .. 200 | 150 0 0 |
| Corkrings | .. 6 | 25 0 0 |
| Knives for cutting corks | .. 2 | 2 0 0 |
| Cork borers | .. 6 | 54 0 0 |
| Cork squeezer | .. 1 | 7 0 0 |
| Cork borer sharpner | .. 3 | 6 0 0 |
| Cork boring machine | .. 1 | 100 0 0 |
| Pith corks of various sizes .. .. . | .. .. | 30 0 0 |
| Total | | 1,235 0 0 |

A. B.—This list includes—

| | |
|---------------------------|---------|
| (1) Non-recurring | 635 0 0 |
| (2) Recurring | 600 0 0 |

(14) Filters.

Glass Filters for Analytical Work.

| | | |
|--|---|--------|
| Buchner's Type | 2 | 40 0 0 |
| Buchner's Conical Type | 3 | 12 0 0 |
| Filter combined with Flask | 3 | 15 0 0 |
| Filter for working under pressure | 3 | 30 0 0 |
| Filter for Micro-Analysis | 6 | 24 0 0 |
| Gas Distributing Tube | 6 | 24 0 0 |
| Gas Washer | 3 | 42 0 0 |
| Potentiometric-Siphon | 2 | 20 0 0 |
| Soxhlet extraction app. with tintred Glass | | |
| Filter | 1 | 40 0 0 |
| do. Thimble | 2 | 10 0 0 |
| do. Thimble Germ proof | 6 | 55 0 0 |

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| Articles. | No. | Price. | |
|--|------|------------|------------|
| | | Rs. | a. p. |
| Filter tubes | 1 | 2 | 0 0 |
| Filter pump Flask | 6 | 37 | 0 0 |
| Dialyser | 4 | 7 | 0 0 |
| Filter pump with gauge | 1 | 45 | 0 0 |
| Filter pump glass | 12 | 40 | 0 0 |
| <i>Filter Papers and Extraction Thimbles.</i> | | | |
| Muenckten's 1F 2½ to 7¼" diam. | 4000 | 71 | 8 0 |
| Muenckten's No. 0 2½ to 7¼ diam. | 1500 | 35 | 8 0 |
| Post lip No. 633 2½, 4 to 15½" diam. | 500 | 69 | 8 0 |
| Folded circles of filter paper 12.5 to 50 mm. 1000 | 1000 | 78 | 0 0 |
| Filter paper case | 6 | 100 | 0 0 |
| Soxhlet's filter paper thimbles 10×50 to 26×60 | 60 | 20 | 0 6 |
| Total | | 855 | 0 0 |

N. B.—This list includes—

| | | |
|-----------------------------------|-----|-----|
| (1) Initial non-recurring | 530 | 0 0 |
| (2) Recurring | 325 | 0 0 |

(15) Glass and Stone Ware.

| | | | |
|--|---------|-----|-----|
| Wash Bottles | 12 doz. | 25 | 0 0 |
| Earlenmeyer flask | 2 " | 20 | 0 0 |
| Retorts | 6 " | 20 | 0 0 |
| Basins with spout | 6 " | 6 | 0 0 |
| Watch glass | 10 " | 120 | 0 0 |
| Reagent bottles of various capacities | 10 " | 125 | 0 0 |
| Laboratory glass tubings of different bores and thickness | | 100 | 0 0 |
| Special monax glass blowing tubings | | 50 | 0 0 |
| Glass rods | | 10 | 0 0 |
| Capillary glass tubings | | 20 | 0 0 |
| Culture flasks of different types | | 50 | 0 0 |
| Automatic pipette | 6 | 30 | 0 0 |
| Y tubes | 3 doz. | 22 | 0 0 |
| T tube | 3 " | 22 | 0 0 |
| Y and T tubes with stop-cock | 1 " | 50 | 0 0 |
| Stop-cocks 2 way straight bore | 12 | 50 | 0 0 |
| " oblique | 12 | 48 | 0 0 |
| " 3 way | 12 | 70 | 0 0 |
| " 2 way capillary | 6 | 20 | 0 0 |
| " 4 way | 6 | 100 | 0 0 |
| Combustion tubing | | 45 | 0 0 |
| Weighing bottles | 2 doz. | 32 | 0 0 |
| Wouff's bottles | 2 " | 150 | 0 0 |
| Pneumatic Trough, round | 1 " | 100 | 0 0 |
| Do. (Stone ware) of the above | 1 " | 150 | 0 0 |
| Gas Jars | 3 " | 250 | 0 0 |
| Glass funnels, plane of different sizes | 4 " | 50 | 0 0 |
| Thistle funnel and Separating funnels | 2 " | 100 | 0 0 |
| Glass boxes with and without holes for experimental physiology, various capacities | 2 " | 400 | 0 0 |

| Articles. | No. | Price. |
|--|--------|-----------|
| | | Rs. a. p. |
| Bottles narrow mouthed flat stoppered— | | |
| 4 ozs. | 50 | 31 4 0 |
| 6 „ | 35 | 17 0 0 |
| 8 „ | 2 doz. | 24 0 0 |
| 10 „ | 2 „ | 24 0 0 |
| 16 „ | 16 „ | 17 8 0 |
| 48 „ | 6 „ | 16 0 0 |
| 64 „ | 6 | 20 0 0 |
| Bottles with extra wide neck— | | |
| 500 cc. | 3 doz. | 75 0 0 |
| 1000 cc. | 2 „ | 100 0 0 |
| Acid dishes— | | |
| 2 3/8" diam. | 6 | 4 4 0 |
| 2 3/4" „ | 6 | 5 0 0 |
| 3 1/8" „ | 6 | 6 0 0 |
| 3 1/2" „ | 6 | 7 8 0 |
| Bottle for dry salts. cap. — | | |
| 8 ozs. | 1 doz. | 14 0 0 |
| 12 „ | 6 | 8 0 0 |
| 20 „ | 6 | 10 8 0 |
| Big bottles for stock solution various capacities | 1 | 100 0 0 |
| Bottles with permanent labels 2 sets of 34 each | .. | 100 0 0 |
| Bottles, Gutta Parcha 4 oz. | 1 | 4 0 0 |
| Drop bottles cap. 30 cc. | 2 doz. | 20 0 0 |
| Drop bottles with rubber teats | 1 „ | 12 8 0 |
| Dropping pipettes | 12 | 1 8 0 |
| Glass aspirators various cap. | 1 doz. | 240 0 0 |
| Stone ware aspirators and bottles various capacities | 9 | 270 0 0 |
| Bell Jars. Open at the top and flange at bottom— | | |
| height 7" 8" 9" diam. 5" 5" 6" | 3 | 52 8 0 |
| Bell Jars. Open at top graduated into cc.— | | |
| 500 cc. | 2 | 10 0 0 |
| 1000 cc. | 1 | 30 0 0 |
| 2000 cc. | 2 | |
| Bell Jars. For covering instruments— | | |
| Height. Diam. | | |
| 5" 5" | 1 | 12 0 0 |
| 6" 6" | 1 | 15 0 0 |
| 7" 6" | 1 | 14 0 0 |
| 8" 10" | 1 | 22 0 0 |
| 14" 14" | 1 | 30 0 0 |
| 20" 20" | 1 | 50 0 0 |

| Articles. | | No. | Price. |
|--|-------|--------|-----------|
| | | | Rs. a. p. |
| Calcium Chloride tubes "U" form, plane— | | | |
| Length. | Diam. | | |
| 4" × ½" | .. .. | 12 | 5 0 0 |
| 6 × ¾" | .. .. | 12 | 7 0 0 |
| 8 × 1" | .. .. | 6 | 7 0 0 |
| 10 × 1" | .. .. | 6 | 7 4 0 |
| " with side tubes— | | | |
| 4 × ½" | .. .. | 6 | 3 0 0 |
| 8 × ¾" | .. .. | 6 | 6 0 0 |
| " with 3 bulbs— | | | |
| 8 × ¾" | .. .. | 2 | 8 0 0 |
| Improved calcium chloride tubes with wall ground in bored stoppers and with bulb at bottom 2 8 0 0 | | | |
| Calcium chloride bulbs 6 23 0 0 | | | |
| Calcium chloride Jars, stoppered height, 16" 3 39 0 0 | | | |
| Stands for supporting calcium chloride tubes 2 12 0 0 | | | |
| Drying apparatus Bonn pattern 2 45 0 0 | | | |
| Drying apparatus Berlin pattern 2 45 0 0 | | | |
| Calcium chloride drying towers 6 30 0 0 | | | |
| Stone ware bottles, cap. 6 gall. 4 70 0 0 | | | |
| Mercury bottle " 10 lbs. 2 3 0 0 | | | |
| Bung Jars. " 10 qrts. 2 13 0 0 | | | |
| Cooling snake (spirals) 4 64 0 0 | | | |
| Stone ware taps 4 32 0 0 | | | |
| Brass taps 2 8 12 0 | | | |
| Glass taps 4 20 0 0 | | | |
| Absorption tubes graduated 3 7 2 0 | | | |
| Absorption tubes graduated of another kind 3 9 9 0 | | | |
| Beakers, Squat form, Jena— | | | |
| 150 cc. .. .. | .. .. | 1 doz. | 20 8 8 |
| 250 cc. .. .. | .. .. | 1 " | 30 0 0 |
| 400 cc. .. .. | .. .. | 1 " | 43 0 0 |
| 600 cc. .. .. | .. .. | 1 " | 54 9 0 |
| 800 cc. .. .. | .. .. | 1 " | 42 0 0 |
| 1000 cc. .. .. | .. .. | 1 " | 50 0 0 |
| 3000 cc. .. .. | .. .. | 1 " | 72 0 0 |
| Beakers, tall form non-spout— | | | |
| 25 cc. .. .. | .. .. | 2 | 7 6 0 |
| 50 cc. .. .. | .. .. | 2 | 8 0 0 |
| 150 cc. .. .. | .. .. | 2 | 10 3 0 |
| 250 cc. .. .. | .. .. | 2 | 12 9 0 |
| 400 cc. .. .. | .. .. | 2 | 14 6 0 |
| " Pyrex— | | | |
| 250 cc. .. .. | .. .. | 2 doz. | 27 0 0 |
| 500 cc. .. .. | .. .. | 2 " | 35 0 0 |
| Monax conical beakers— | | | |
| 250 cc. .. .. | .. .. | 6 | 8 0 0 |
| 400 cc. .. .. | .. .. | 6 | 8 0 0 |
| 1000 cc. .. .. | .. .. | 1 doz. | 6 1 0 |

| Articles. | No. | Price. | | |
|--|--------|--------|----|----|
| | | Rs. | a. | p. |
| Flasks resistance F. B. | | | | |
| 150—4000 | 3 doz. | 180 | 0 | 0 |
| Resistance Flasks R. S. | | | | |
| 250—300 | 3 doz. | 60 | 0 | 0 |
| Beaker Flasks— | | | | |
| 100 cc. | 3 | 4 | 4 | 0 |
| 600 cc. | 3 | 3 | 2 | 0 |
| 1000 cc. | 3 | 10 | 0 | 0 |
| Conical Flasks (R. G.)— | | | | |
| 175—1000 cc. | 4 doz. | 45 | 0 | 0 |
| Distillation Flasks (R. G.) | | | | |
| 100—5000 cc. | 9 doz. | 163 | 0 | 0 |
| Kjeldahl's Flasks (R. C.)— | | | | |
| Short neck— | | | | |
| 300 c.c. | 6 | 7 | 0 | 0 |
| 500 cc. | 3 | 4 | 4 | 0 |
| Long neck— | | | | |
| 300 cc. | 6 | 7 | 8 | 0 |
| 500 cc. | 6 | 9 | 0 | 0 |
| 800 cc. | 6 | 13 | 0 | 0 |
| Pyrex— | | | | |
| 500 cc. | 6 | 10 | 0 | 0 |
| 1000 cc. | 4 | 20 | 0 | 0 |
| Evaporating Basins (R. C.)— | | | | |
| 200 cc. | 1 doz. | 15 | 6 | 0 |
| 400 cc. | 1 " | 21 | 3 | 0 |
| 500 cc. | 6 | 18 | 11 | 0 |
| Crystallising—Dishes (R. G.) | | | | |
| „ Non-spout 50—1000 cc... .. . | 3 doz. | 30 | 0 | 0 |
| „ with-spout— | | | | |
| 500 cc. | 6 | 8 | 0 | 0 |
| 1000 cc. | 6 | 16 | 0 | 0 |
| Monax Co ₂ Flasks 250—500 cc. | 1 doz. | 12 | 0 | 0 |
| Test tubes (Pyrex) 10×75 to 25×300 | 12 " | 52 | 4 | 0 |
| Pyrex copper determination flask 250 cc. | 1 " | 16 | 0 | 0 |
| Pyrex Centrifuging Tubes— | | | | |
| 15 cc. | 6 | 4 | 0 | 0 |
| 25 cc. | 6 | 5 | 0 | 0 |
| 50 cc. | 6 | 6 | 0 | 0 |
| Pyrex Ignition Tubes— | | | | |
| 10×70 | 1 doz. | 3 | 9 | 0 |
| 14×100 | 1 " | 4 | 6 | 0 |
| 16×125 | 1 " | 6 | 0 | 0 |
| Burettes: with 3 way glass stop cock— | | | | |
| 50 cc. | 3 | 20 | 0 | 0 |
| 100 cc. | 2 | 16 | 0 | 0 |
| Do. do but with white enamel back and blue line 50 cc. | 4 | 00 | 0 | 0 |

| Articles. | No. | Price. | |
|---|---------|--------|-------|
| | | Rs. | a. p. |
| Burettes with tube bent at right angles 50 cc. | 2 | 9 | 2 0 |
| Burettes (Cissler's) for volatile solution 50 cc. | 2 | 16 | 0 0 |
| Anti-parallel Cards | 1 doz. | 5 | 0 0 |
| Pipettes, Bulb form with one mark on stem 1 cc. to 100 cc. | 3 doz. | 20 | 0 0 |
| Do. with safety bulb 5 cc. to 100 cc. | 2 doz. | 20 | 0 0 |
| Do. Plane 1 oz. | 2 | 1 | 0 0 |
| Do. Plane 2 oz. | 2 | 1 | 8 0 |
| Do. Graduated 1 cc. to 25 cc. | 1 doz. | 10 | 0 0 |
| Measuring Cylinder, Tall form figured in both direction, divided into 100 div. 100 c. to 1000 cc. | 2 doz. | 30 | 0 0 |
| Do. Graduated in both English and Metric systems, 100—1000 cc. | 5 | 28 | 0 0 |
| Glass Jugs | 6 | 8 | 4 0 |
| Measuring Flasks, stoppered 25cc—2000 cc. | 2 doz. | 60 | 0 0 |
| Standard Flasks, verified and stamped 500 cc. to 1000 cc. | 1½ doz. | 175 | 0 0 |
| Porcelain Basins, Royal Worcester— | | | |
| with spout— | | | |
| 100 cc. | 6 | 8 | 10 0 |
| 300 cc. | 6 | 16 | 0 0 |
| Deep form— | | | |
| 260 cc. | 3 | 9 | 0 0 |
| 500 cc. | 3 | 14 | 0 0 |
| Shallow form— | | | |
| 150 cc. | 3 | 7 | 4 0 |
| 290 cc. | 3 | 9 | 2 0 |
| Crucibles, R. W. 25 cc. to 140 cc. | 3 doz. | 42 | 8 0 |
| Covers for above | .. | 12 | 0 0 |
| R. Worcester Porcelain 30 cc. to 1000 cc. | 6 | 30 | 0 0 |
| Do. Buchner Funnel— | | | |
| 51 mm. | 2 | 9 | 0 0 |
| 100 mm. | 2 | 18 | 0 0 |
| 214 mm. | 1 | 22 | 0 0 |
| Do. Porcelain Funnel— | | | |
| 52 mm. | 1 | 2 | 9 0 |
| 77 mm. | 1 | 4 | 3 0 |
| 130 mm. | 1 | 8 | 6 0 |
| R. W. Patent Funnel Buchner's Form— | | | |
| 100 mm. | 1 | 10 | 6 0 |
| 214 mm. | 1 | 31 | 6 0 |
| 170 mm. | 1 | 24 | 0 0 |
| R. W. P. Spotting Plates | 3 | 13 | 2 0 |
| Do. Mercury Trough | 3 | 21 | 5 0 |
| Do. Combustion Tubes | 2 | 35 | 9 0 |
| Do. do. boats | 5 | 9 | 0 0 |
| Gooch. | | | |
| Gooch Crucibles with perforated bottom 25 cc. | 6 | 12 | 0 0 |
| Mortar Pestles | 8 | 36 | 0 0 |

| Articles. | No. | Price. | |
|-------------------------------|-----|--------------|------------|
| | | Rs. | a. p. |
| Nickel Triangles | 6 | 5 | 0 0 |
| „ Basins R. B. | 6 | 23 | 8 0 |
| „ Tongs | 6 | 12 | 0 0 |
| „ Spatulas | 12 | 14 | 0 0 |
| Vitreosil Basin | 1 | 4 | 4 0 |
| do. Do. Crucibles | 2 | 4 | 0 0 |
| do. Do. flat | 1 | 5 | 0 0 |
| Quartz Combustion Tubes | 2 | 80 | 0 0 |
| Total | | 5,392 | 0 0 |

N. B.—This list includes—

| | | |
|-------------------------|-------|-----|
| (1) Non-recurring | 4,042 | 0 0 |
| (2) Recurring | 1,350 | 0 0 |

ENCLOSURE II.

MINUTES OF THE 2ND MEETING OF THE UNITED PROVINCES
AGRICULTURAL RESEARCH COMMITTEE HELD ON JUNE THE
2ND, 1930, AT 11 A.M. AT THE CHALET, NAINI TAL.

• • • • •

II. The Committee considered an application submitted by the Vice-Chancellor of the Benares Hindu University for a non-recurring grant of Rs. 4,18,184 and a recurring grant of Rs. 61,277 for a period of 5 years, for the University Institute of Agricultural Research (Appendix I).

The scheme was fully discussed in its application to agricultural research and research workers throughout India. The Committee was in full agreement with the creation of an Institute for research in plant physiology, but considered that the comprehensive scheme proposed for dealing with various branches of agricultural research would entail considerable overlapping with the research carried on by the Imperial and Provincial Departments of Agriculture, and by other Institutions.

The Committee unanimously agreed to support the creation, at the Benares Hindu University, of a research Institute for plant physiology, specialising in the physiology of the metabolism of plants, but considered that as this proposed institute would carry on fundamental research applicable to the whole of India, and of equal importance to all the provinces, it was desirable that the scheme should be reported upon by a committee appointed by the Imperial Council of Agricultural Research.

The Committee was further unanimous in its opinion that capital provision sufficient to complete the buildings of the research laboratories should be made available during the current financial year, provided that the sub-committee of the Imperial Council of Agricultural Research reported favourably upon the All-India importance of the scheme.

It was considered advisable to defer detailed consideration of the estimates for laboratory equipment until the programme of work could be more specifically determined, and the question of capital expenditure on buildings had been settled. The following resolutions were passed by the Committee :—

Res. 1 (a).—“The Committee recommends the scheme for the establishment of an Institute of Agricultural Research at the Benares Hindu University, specialising in the physiology of the metabolism of plants.

It wishes to emphasise that no provision exists for research in this subject in the Imperial Department of Agriculture, and either no provision or very limited provision exists in the provincial departments and provincial universities. The Benares Hindu University is, in the fullest sense, an All-India Institution drawing its workers and support from every part of India. It has a high record of achievement in this branch of work and the Committee considers that it is well placed for development on the lines indicated above.

The Committee considers that the scheme is essentially an All-India and not a provincial scheme, and that this aspect should be thoroughly examined by an expert sub-committee appointed by the Advisory Board of the Imperial Council of Agricultural Research and tentatively suggests the following personnel :—

- (1) Mr. B. C. Burt, B.Sc., C.I.E., M.B.E., Agricultural Expert to the Imperial Council of Agricultural Research.
- (2) Dr. S. K. Mukerji, M.Sc., D.Sc. (London), F.L.S. (London), Professor of Botany, Lucknow University, Lucknow.

(3) Professor P. Parija, I.E.S., Professor of Botany, Ravenshaw College, Cuttack.

(4) Professor R. S. Inamdar, M.Sc., Botany Department, Benares Hindu University."

Res. 1 (b).—"Subject to the favourable report of the Sub-Committee suggested in Resolution 1 (a) above, the Committee recommends that in the first instance a grant of Rs. 1,65,000 should be made to the Benares Hindu University for the completion of the laboratory and fittings. Without this no progress can be made and the Committee suggests that a decision should be arrived at not later than the cold weather meeting of the Imperial Council 1930-31."

APPENDIX XXXIII.

Statement showing the recommendations made in the Proceedings of the first meeting of the Fertilisers Committee held in June 1930, and the action taken thereon.

| No. | Page No. of Proceedings and item No. of Agenda. | Subject. | Recommendation of the Committee. | Action taken. |
|-----|---|--|--|---|
| 1 | Page 2. (Item No. 1 of Agenda.) | The careful study of the existing data and the correlation of the results hitherto obtained from field trials of (a) farm-yard manure, (b) green manure, (c) oil cakes, (d) bone-meal, (e) fish manure and (f) Indian saltpetre. | (1) The Imperial Council of Agricultural Research should give a small grant for three months to each province without exception, for extra staff to assist in this work; (2) that the grants should be for the salary of one Agricultural Officer on Rs. 350 for three months and for one Statistical Assistant on Rs. 200 for three months making a total contribution to each province of Rs. 1,650. | Local Governments addressed on the matter with the sanction of the Governing Body. Most of the Governments have agreed. |
| 2 | Page 8. (Item No. 2 of Agenda.) | The means by which the above manures may be conserved. | That the provincial representatives on the Committee should write notes on the methods by which in their opinion, the oil-crushing industry in India could be encouraged for the consideration of the oil seed crushing Committee. | Members of the Fertilisers Committee addressed in the matter. |
| 3 | Page 10. (Item No. 2 of Agenda.) | (d) Bone-meal | The possibility of easily disintegrating bone by previous fermentation should be investigated before the next meeting of the Committee. | The members who undertook to carry out the necessary experiments are carrying out the required action in the matter. |
| 4 | Ditto | Ditto | The Committee, while provisionally of the opinion that an all-India Fertilisers Act was necessary, recommended that, between now and its next meeting when the question would be further considered, provinces should examine the necessity for an all-India Act. | Members of the Committee requested to forward their views and any definite evidence that they may have for such an act. |
| 5 | Pages 10-11. (Item No. 2 of Agenda.) | (e) Fish-manure | Enquiries should be made between now and the next meeting from the Director of Fisheries, Madras, and the authorities concerned in Bombay, Bengal and Burma as to the existing condition of the fishing industry in those provinces and as to its possibilities of development in so far as supplies of fish manure were concerned. | Enquiries made; and some replies received. |
| 6 | Page 11. (Item No. 2 of Agenda.) | (f) Indian Saltpetre | Indian Saltpetre was not important from an indigenous mineral point of view. | No action. |
| 7 | Page 12 | Night soil | Though there might be nothing in these beliefs held by some people that manuring with poudrette spread disease, it might be just as well to get the opinion of some public health authority on this point; e.g., whether the use of poudrette as manure had any relation to the spread of hookworm. | The Public Health Commissioner to the Government of India has been addressed. |

APPENDIX XXXIV.

**PRELIMINARY REPORT BY THE FOREST RESEARCH INSTITUTE,
DEHRA DUN, ON THE CALORIFIC VALUES OF SOME INDIAN
WOODS.**

The attached copy of a preliminary report (Annexure I) received from the Forest Research Institute, Dehra Dun, on the calorific value of some Indian woods and of a note (Annexure II) by the Agricultural Expert Adviser to the Council are submitted for the consideration of the Advisory Board.

M. S. A. HYDARI,
Secretary.

The 7th October 1930.

ANNEXURE I.

THE DETERMINATION OF THE CALORIFIC VALUES OF INDIAN WOODS.

Perusal of the literature shows that the only record of the Calorific values of Indian woods is that by Dr. Leather* who in 1894-96 determined, for some 22 woods, the heat values in terms of evaporative power. The evaporative power being the number of pounds of water at 212° F. that can be evaporated or converted into steam by one pound of the wood. Mr. Pura Singh (Forest Bulletin No. 1, 1911) redetermined the Calorific values of some of the woods in Dr. Leather's list, and brought them in line with the results of his own experiments, expressing the values in Calories and the British Thermal Units. These determinations were carried out in Lewis Thompson's Calorimeter, an apparatus of not very great accuracy and, hence the results that were found are not in agreement with the values now obtained, using the latest type of Calorimeter.

The previous workers made the determinations on an average sample of wood and did not take into account the variation in the Calorific power caused by—

- (a) the difference in the values of heartwood and the sapwood, and
- (b) the presence of volatiles and resins.

It was, therefore, considered necessary to redetermine the Calorific values of the Indian woods using the latest type of Calorimeter. The experiments described in this note, have been made with the Parr Standard Calorimeter, supplied by the Standard Calorimeter Company, East Moline, Illinois, U. S. A., using the standard chemicals for combustion, as recommended by the manufacturers. In experiments with Calorimeters of this type, an accuracy of the temperature reading to a second place of decimal is regarded as sufficient and this affects the final results by 31 Calories. The variation in the final result due to ash determination amounts to about 8 Calories for an error of 1 per cent. and, a slightly higher variation may be accounted for errors in moisture determination. In the final figures an error, therefore, of ± 50 Calories is reasonably permissible and this represents, in an average Calorific value of 5,000 Calories an experimental error of one per cent.

The usual practice in determinations of this sort is, to select a piece of wood containing both the heartwood and the sapwood and, after drying it in the powdered form to determine its Calorific value. In this it is presumed that there is no difference in the Calorific value of the heartwood and the sapwood and, that the proportion of the heartwood and the sapwood is about the same in all cases, thus representing an average sample of the wood. In order to verify these assumptions preliminary experiments were performed on the heartwood and the sapwood of a few species, chosen at random. Preliminary experiments showed that the difference in the Calorific values between the sapwood and the heartwood varies from a minimum of Zero, in many cases to 525 Cal. in *Sterculia urens* and 598 in *Tectona grandis*. These differences are too high to be neglected. The following table shows the difference in the Calorific values of the heartwood and sapwood of some of the species :—

| Species. | Heartwood (calories). | Sapwood (calories). | Difference (calories). |
|---------------------------------------|--------------------------|------------------------|---------------------------|
| <i>Tectona grandis</i> | 5,468 | 4,870 | 598 |
| <i>Sterculia urens</i> | 5,651 | 5,126 | 525 |
| <i>Cedrus Deodaru</i> | 5,478 | 5,053 | 425 |
| <i>Shorea robusta</i> | 5,395 | 5,071 | 324 |
| <i>Ougeinia dalbergioides</i> | 5,090 | 4,778 | 312 |
| <i>Dalbergia Sissoo</i> | 5,056 | 4,775 | 281 |
| <i>Morus alba</i> | 4,867 | 4,600 | 267 |

* Appendix.

The difference in the calorific values of the heartwood and the sapwood may be due to a variety of causes. One such cause that has been detected in some cases is the concentration of resins and volatiles in the heartwood. For example, *Cedrus Deodara* is well-known to possess volatile organic substances which are removed by heating the wood to about 105°C. Experiments have shown that the concentration of such volatiles is greater in the heartwood than in the sapwood. If, therefore, the calorific value of deodar is determined when it is air dried, the heat value is found to be very much higher when calculated on zero moisture basis than the heat value of the vacuum dried wood. Also the value for the sapwood is much lower than that for the heartwood, as shown in the following table :—

| <i>Cedrus Deodara.</i> | Sapwood (calories). | Heartwood (calories). |
|---|---------------------|-----------------------|
| Calorific value of an air dried sample calculated on zero moisture basis. | 5,053 | 5,478 |
| Calorific value for vacuum dried sample | 5,102 | 5,132 |

It is clear from the above results that the difference in the values for the heartwood and the sapwood is primarily due to the volatile concentration in the former and, that by heat and evacuation these heat giving constituents are removed. The calorific value for *Cedrus Deodara* should, therefore, be taken as the higher figure of 5,478. A more remarkable case is that of *Tectona grandis*, where the difference in the heartwood and the sapwood is as high as 598 Cal. and this again is due to the presence of large quantities of oil in the heartwood. The oil, however, is not lost as in the case of *Cedrus Deodara* by heating at 105°, but it can more or less be removed by soaking in suitable solvents. The results obtained in this manner are noted below :—

| <i>Tectona grandis.</i> | Heartwood calories. |
|---|---------------------|
| Calorific value of the vacuum dried wood | 5,468 |
| Calorific value of the above after soaking in petroleum ether for 24 hours. | 5,282 |

As a rule, heartwoods in most of the species show higher heat values than the sapwoods but there are certain species in which the heartwood shows a lower value than the sapwood. Reason for such an abnormality is not apparent and this point is being further investigated. The following table shows the species in which the heartwood has a lower calorific value than the sapwood :—

| Species. | Heartwood (calories). | Sapwood (calories). |
|--|-----------------------|---------------------|
| <i>Anogeissus latifolia</i> | 4,360 | 4,761 |
| <i>Grewia tiliaefolia</i> | 5,082 | 5,248 |
| <i>Lagerstromia parviflora</i> | 4,797 | 4,896 |

In case of such woods that do not possess any visible heartwood, only one determination has necessarily been made. The following is the list of such species that have been found in our work, so far. These species were obtained from the Divisional Forest Officer, Dehra Dun :—

Kydia calycina.
Adina cordifolia.
Mallotus philippinensis.
Celtis australis.
Bombax malabaricum.
Terminalia belerica.
Bauhinia variegata.
Zizyphus xylopyra.
Grewia vestita.
Butea frondosa.
Capparis aphylla.
Rhododendron arboreum.
Abies Webbiana.

For purposes of uniformity determinations of the heat values in all cases have been made on materials dried in air oven at 105°C. and keeping in vacuum desiccator to zero moisture, but in certain cases (especially in those containing volatiles) this would not appear to be the best course, as there would be a danger of losing all the volatiles and, hence the combustible materials and, thereby lowering the calorific values. Experiments were, therefore, performed on some of the woods containing volatiles to see if any appreciable loss in the amounts of the volatiles is caused when an air dried powder of such a wood is dried further in hot air ovens and desiccators. The calorific value of a sample of air dried powder of *Pinus longifolia* was determined and a portion of the same sample was heated to 105°C. in an air oven till no loss in weight was observed and, was further kept in an evacuated desiccator over strong sulphuric acid for 48 hours and the calorific value determined again. The following results were obtained :—

Calorific value of the air dried wood powder .. = 5,042 Cal.

The above wood powder was found to contain moisture = 6.26 per cent.

∴ The Calorific value for the vacuum dried wood as calculated from the above results

$$= 5,042 \times \frac{100}{100 - 6.26} \text{ or } \dots = 5,379 \text{ Cal.}$$

Calorific value of the vacuum dried wood powder .. = 5,340 Cal.

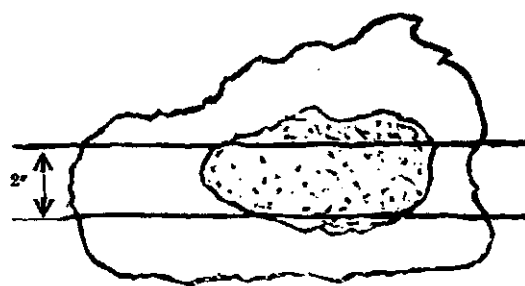
The above results indicate that there is practically no loss of the heat power of the *Pinus longifolia* wood when heated to a temperature of 105°C. in other words, there is no loss of the volatile constituents of the wood on drying from the air dried stage to the vacuum dried stage. These results are in agreement with the results obtained by Parr and Davidson (Journ. Ind. and Eng. Chem. Vol. 14, No. 10, page 935), who found that in pine wood even at a temperature of 135—140°C., the loss of the volatile constituents other than water was about 0.3 per cent. and that it may be considered as negligible at a temperature of 105°C. But these remarks are not applicable to all the cases, as has already been shown in the case of *Cedrus Deodara* that almost whole of the volatiles are lost when the wood powder is heated to 105°C. in an air oven and later dried in a vacuum desiccator. For woods which are known to possess volatile matters, determinations have

therefore been made on the air dried materials and, for the purposes of comparison have been calculated on zero moisture basis. In the case of *Pinus longifolia* difference in the calorific values in the samples obtained from different sources is found to be due to different concentrations of resinous materials in the wood. In order to make certainty of this point, a sample of *Pinus longifolia* wood known to be highly saturated with oleoresins was procured from West Almora and the heat values of this sample were found to be very much higher than the heat values of an average sample of Chir Wood. The following table gives the calorific values of Chir Wood obtained from different sources :—

| Locality from which the sample was obtained. | Calorific value (calories). | Remarks. |
|--|-----------------------------|--|
| Ranikhet | 5,379 | Sapwood. |
| Dehra Dun | { 4,948 5,040 | Sapwood. Heartwood. |
| West Almora | 6,125 | Chilka (wood highly saturated with resin). |

Experimental.

Preparation of the Sample.—Properly identified and a perfectly sound specimen of wood about six inches thick is taken and after removal of the bark,



a central portion about 2 in. wide is cut off, as shown in the figure. From this portion, sapwood from either side of the heartwood is carefully separated and both the heartwood and the sapwood are then carefully reduced to a coarse powder separately with a clean file. The coarse powder is then spread out, for several hours for air drying, after which a 20 gram portion of it is reduced further to a very fine powder by grinding, in order to make it pass

through a 100 mesh sieve. The powder obtained in this manner is kept in well stoppered bottles for further work.

Moisture determination.—The importance of the determination of the amount of moisture present in wood cannot be over-estimated in calorimetric work, as the latter is of very little value without the former. Woods contain varying amounts of water according to the length of time they have been exposed to air after felling and, even when they are allowed to remain exposed to air long enough to attain a state of equilibrium, some species would always contain more water than the others, even under identical conditions. For accurate work it is necessary, however, that the water should be removed as completely as possible and this is accomplished by heating the air dried wood powder in an air oven at 105°C., for about 10 hours and, allowing it to cool in an evacuated desiccator over concentrated sulphuric acid for a further period of about 48 hours. Loss in weight during these operations is,

therefore, mainly due to water and the moisture content is then calculated on the air dry wood. The variation of moisture has been found to be from 4.67—20.83 per cent. Very faulty results may be obtained by incomplete removal of the moisture as the moisture contained in wood reduces its heat producing power not only by replacing combustible materials, but by absorbing part of the heat produced for its own vapourisation. The following example will make the point clear. Supposing, the wood containing 20 per cent. of moisture had a calorific value of 4,000, then the calorific value of the dried wood, *i.e.*, the one containing zero moisture would be $4,000 \times \frac{100}{100-20} = 5,000$ or 25 per cent. higher than for the moist wood. It is, therefore, apparent that wood intended for fuel should be as dry as possible.

Ash determination.—The ash content of wood is determined by weighing the quantity of ash left behind on complete combustion of a weighed quantity of the finely powdered vacuum dried wood. The ash percentage in normal cases is found to be between 1 to 4 per cent. but in certain woods it is considerably higher, *e.g.*, the heartwood of *Anogeissus latifolia* found to contain 11 per cent. of ash. The ash content of woods is a fairly variable factor being different in trees of the same species obtained from different localities depending on the soil and the climatic conditions. But the actual heat value of the wood is not effected very greatly by the ash variation, the calorific value being 8 Cal. per 1 per cent. difference in ash.

Calorimeter and the Temperature reading.—Parr's Standard Calorimeter consists of a polished nickel plated copper jar of about 2 litres capacity placed inside a well insulated jacket. Into the jar is placed a fusion cup which holds the material (0.5 gr.) to be combusted together with the oxygen producing material (sodium peroxide) and the accelerator potassium chlorate (1 gram). The cap of the fusion cup has an arrangement for holding ignition wire, which when electrically connected, fuses (requires 2 amp. current) and starts the combustion of the materials in the fusion cup. The fusion cup is thoroughly water proof and has on its outside an arrangement for fixing two blades which act as stirrers, when the fusion cup is revolved inside the jar by a pulley and a small motor and in this manner a uniform temperature is maintained. Into the jar is poured exactly 2 litres of distilled water. In order to avoid the radiation correction, the water is kept as many degrees below the room temperature as the final temperature after ignition is expected to rise. Perfectly dry materials are employed for determinations of calorific values. The heat given out on combustion of the materials inside the fusion cup is absorbed by the cold water, the rise in temperature of which is noted very carefully. The temperature of the water is taken every minute for 5 mts. before ignition and the temperature record is continued to be taken at one minute interval, for about 10 or 12 mts. after ignition. The following example illustrates the actual method of determination of the Calorific values :—

Specimen G. 160. *Dalbergia Sissoo* (heartwood)—

| | | |
|---|----|------------------|
| Weight of the vacuum dried wood powder .. | .. | = 0.500 gr. |
| Weight of the accelerator .. | .. | = 1.00 gr. |
| Ash content of the wood .. | .. | = 2.40 per cent. |

Readings :—

| Time in mts. | Temperature of water in degrees Centigrade. |
|-----------------|---|
| After 1 | 25.99 |
| 2 | 25.99 |
| 3 | 25.99 |
| 4 | 25.99 |

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| | | | | | | |
|------------------------------|----|----|----|----|-------|----------------------|
| 5 | .. | .. | .. | .. | 25.99 | |
| 6 | .. | .. | .. | .. | 25.99 | fired at this stage. |
| 7 | .. | .. | .. | .. | 26.80 | |
| 8 | .. | .. | .. | .. | 27.44 | |
| 9 | .. | .. | .. | .. | 27.62 | |
| 10 | .. | .. | .. | .. | 27.70 | |
| 11 | .. | .. | .. | .. | 27.76 | |
| 12 | .. | .. | .. | .. | 27.78 | maximum reached. |
| 13 | .. | .. | .. | .. | 27.78 | |
| 14 | .. | .. | .. | .. | 27.78 | |
| 15 | .. | .. | .. | .. | 27.78 | |
| 16 | .. | .. | .. | .. | 27.78 | |
| Room temperature | .. | .. | .. | .. | 26.80 | |
| Initial temperature of water | .. | .. | .. | .. | 25.99 | |
| Final temperature of water | .. | .. | .. | .. | 27.78 | |

Correction factors :—

Since the initial temperature of water is about as much below the room temperature as the final temperature is above it, therefore the correction for the heat lost by radiation is practically Zero.

| | | |
|---|----|------------------------------|
| Heat absorbed by water, liberated on ignition of the fuse wire .. | .. | == 0.0030°C. |
| Heat due to ash .. | .. | == 0.0025°C. × 2.40 = 0.0060 |
| Heat due to 1 gram of Accelerator .. | .. | == 0.1500°C. |
| <hr/> | | |
| Total heat correction .. | .. | == 0.1590°C. |
| Rise in temperature of water .. | .. | == 1.7900°C. |
| Less total heat correction .. | .. | == 0.1590°C. |
| ∴ Corrected rise .. | .. | == 1.6310°C. |

The constant for the Calorimeter as given by the makers, tested and found correct 3,100.

$$\therefore \text{The Calorific value} = 3,100 \times 1.6310 = 5,056 \text{ Calories.}$$

The factor 3,100 has been deduced by the manufacturers as follows :—

“The water used plus the water equivalent of the metal in the instrument amounts to 2,123.3 gr. In the reaction 73 per cent. of the heat is due to combustion of coal and 27 per cent. is due to the heat of combination of Co and water with the chemicals. If now 0.50 gr. of coal causes 2,123.3 gr. of water to rise ‘r’ degrees and if only 73 per

cent. of this is due to combustion then $0.73 \times 2123.3 \times 2 \times 'r' =$ rise in temperature which would result from combustion of an equal weight (2,123.3 gr.) of coal $= 3,100$. The factor 2 is used instead of the divisor 0.5, the weight of coal taken. If the thermometer used is graduated in the Fahrenheit scale, then obviously multiplying by the factor 3,100 will give the results in British Thermal Units (B. T. U.). If, however, the thermometer used is graduated in the Centigrade scale, then the product derived by the use of the factor 3,100 will give the results in Calories."

In the table of results, the Calorific power is given both in Calories as well as in B. T. U.

One Calorie is the amount of heat required to raise the temperature of 1 gram of water by one degree Centigrade.

One B. T. U. is the amount of heat required to raise the temperature of one pound of pure water by one degree Fahrenheit.

Determination of the Calorific Values of some of the Indian Woods.

| Serial No. | Scientific name. | Locality where found. | Vernacular names. | Trade names. | Description. | Moisture on the air-dry %. | Ash on the vacuum-dry %. | Calorific Values for vacuum-dried materials. | | Previous figures (Calories) Purn Singh's unless otherwise stated. | Difference in Calorific power between sapwood and heartwood (Calories). | Remarks. |
|------------|--------------------------|--|---|----------------------------------|--------------|----------------------------|--------------------------|--|---------|---|---|--|
| | | | | | | | | Calories. | B. T. U | | | |
| 1 | Acacia Catechu .. | Common in most parts of India and Burma. | Khair (Hind) Sha (Burma). | Cutch .. | Sapwood .. | 14.76 | 2.26 | 5,026 | 9,047 | 4,566 | 92 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood .. | 13.37 | 2.41 | 5,118 | 9,212 | | | |
| 2 | Terminalia tomentosa | Common throughout India, in places ascending to 4,000'. | Sain, Asaina (Hind) | Lanrel .. | Sapwood .. | 15.47 | 2.59 | 4,916 | 8,840 | 4,923 | 167 | Specimen from Madras. |
| | | | | | Heartwood .. | 20.83 | 5.38 | 5,083 | 9,149 | | | |
| 3 | Shorea robusta .. | Along the foot of the Himalayas, in Nepal, Assam, Bengal Bihar and Orissa, Central India and North Madras. | Sal, Sakku (Hind) Shal (Bengal). Gugsal (Telugu). | Sal .. | Sapwood .. | 8.22 | 0.47 | 5,071 | 9,128 | 4,934 | 324 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood .. | 10.11 | 0.68 | 5,395 | 9,711 | | | |
| 4 | Sterculia urens .. | Dry forests of Northern and Central India, the Deccan and in Burma. | Gulu, tanuku, karrai (Hind); Katira (Garhwal). | .. | Sapwood .. | 8.71 | 1.31 | 5,126 | 9,227 | .. | 525 | Specimen from Forest Research Institute. |
| | | | | | Heartwood .. | 6.76 | 1.64 | 5,651 | 10,172 | | | |
| 5 | Dipterocarpus indicus | Evergreen forests of Konkan, Kanara, Malabar and Travancore. | Guga (Kan) .. Ennei (Tamil). | .. | Sapwood .. | 6.75 | 1.47 | 5,094 | 9,160 | .. | 68 | Do. |
| | | | | | Heartwood .. | 6.07 | 0.71 | 5,162 | 9,292 | | | |
| 6 | Dipterocarpus Griffithii | Assam, Burma .. | Gurjan .. | Gurjan .. | Sapwood .. | 4.67 | 0.88 | 5,099 | 9,178 | .. | 1 | Do. |
| | | | | | Heartwood .. | 5.45 | 0.76 | 5,100 | 9,180 | | | |
| 7 | Dillenia pentagyna .. | Assam, Bengal .. | .. | .. | Sapwood .. | 6.39 | 1.59 | 5,093 | 9,167 | 4,956 | 0 | Do. |
| | | | | | Heartwood .. | 6.53 | 1.58 | 5,093 | 9,167 | | | |
| 8 | Pinus longifolia .. | N. W. Himalaya .. | Chir, Chil (Hind) | Chir .. | Sapwood .. | 6.17 | 0.39 | 4,948 | 8,906 | 5,080 | 92 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood .. | 5.94 | 0.45 | 5,040 | 9,072 | | | |
| 9 | Cedrus Deodara .. | N. W. Himalaya .. | Deodar .. | Deodar, Himalayan Cedar. | Sapwood .. | 5.63 | 0.42 | 5,053 | 9,095 | 4,577 | 425 | Specimen from Ranikhet. |
| | | | | | Heartwood .. | 6.59 | 0.59 | 5,478 | 9,860 | | | |
| 10 | Kydia calycina .. | Sub-Himalayan tract of east Indus. | Pala, Palu (Hind) | .. | Sapwood .. | 6.29 | 2.73 | 4,930 | 8,874 | 4,522 | .. | Specimen from Dehra Dun Division. No heartwood in this Sp. |
| 11 | Adina cordifolia .. | Deciduous forests of India and Burma. | Haldu (Hind), hnaw (Burma) haddi (S. India). | Haldu .. | Sapwood .. | 8.38 | 0.75 | 5,100 | 9,180 | 3,855 | .. | Do. |
| 12 | Anogeissus latifolia .. | Sub-Himalayan tract from Ravi to Nepal, Central and South India. | Dhaura, dhauri, bakli .. | Axlewood .. | Sapwood .. | 5.40 | 4.52 | 4,761 | 8,570 | 4,156 | 392 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood .. | 15.52 | 11.00 | 4,369 | 7,864 | | | |
| 13 | Mallotus philippinensis | Sub-Himalayan from Punjab eastwards, Bengal, C. and S. India, Burma. | Raini, Rohni (Hind.), Tawthidin (Burm.), Kapila (Tam.). | .. | Sapwood .. | 11.38 | 5.53 | 4,567 | 8,221 | 4,080 | .. | Do. |
| 14 | Albizia Lebbek .. | Sub-Himalayan tract upto 5,000'. Common in C. and S. India and Burma. | Siris (Hind); Kakoh (Burma); Vagsi (Tam.). | Kakko (also East Indian Walnut). | Sapwood .. | 4.93 | 1.29 | 5,096 | 9,173 | 4,591 | 35 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood .. | 5.74 | 0.68 | 5,131 | 9,236 | | | |

Determination of the Calorific Values of some of the Indian Woods—contd.

| Serial No. | Scientific name. | Locality where found. | Vernacular names. | Trade names. | Description. | Moisture on the air dary %. | Ash on the vacuum dry %. | Calorific Values for vacuum-dried materials. | | Previous figures (Calories) Puran Singh's unless otherwise stated. | Difference in calorific power between sapwood and heartwood (Calories). | Remarks. |
|------------|-----------------------------------|---|--|--------------|--------------|-----------------------------|--------------------------|--|--------|--|---|--|
| | | | | | | | | Calories. | B.T.U. | | | |
| 15 | <i>Grewia tiliaefolia</i> .. | Indian peninsula and Ceylon; also in N. W. India. | Dhamin, pharsa, dhaman | Dhaman .. | Sapwood .. | 4.82 | 1.68 | 5,248 | 9,446 | 4,424 | 166 | Specimen from the store of the Forest Economist. |
| | | | | | Heartwood .. | 5.49 | 3.09 | 5,982 | 9,148 | | | |
| 16 | <i>Celtis australis</i> .. | N. W. Himalaya, from the foot to 8,000' also Punjab plains. | Taghar, Batkar, Kharik. | .. | Sapwood .. | 5.62 | 4.02 | 4,547 | 8,185 | .. | .. | Specimen from Dehra Dun Division. No heartwood in this specimen. |
| 17 | <i>Bombax malabaricum</i> . | Common in India and Burma ascending to 3,500'. | Simal (Hind.) Shimbai (Hind.), Illavu (Tam.) Letpan (Burm.). | Semul .. | Sapwood .. | 5.04 | 3.68 | 4,705 | 8,469 | 4,517 | .. | Specimen from the Dehra Dun Division. |
| 18 | <i>Dalbergia Sissoo</i> .. | Sub-Himalayan tract and in outer valleys, from the Indus to Assam. | Sissoo, Shisham (Hind.) .. | Sissoo .. | Sapwood .. | 10.56 | 2.69 | 4,775 | 8,595 | 4,618 | 281 | Do. |
| | | | | | Heartwood .. | 9.93 | 2.40 | 5,056 | 9,101 | | | |
| 19 | <i>Lagerstromia parviflora</i> | Sub-Himalayan tract. Assam-Lower Bengal, C. and S. India in deciduous forests. Upper Burma. | Dhaura (Hind.); Zaung-bali (Upper Burma). | Lendi Nandi | Sapwood .. | 17.89 | 1.14 | 4,896 | 8,813 | 4,379 | 99 | Do. |
| | | | | | Heartwood .. | 18.83 | 1.84 | 4,797 | 8,635 | | | |
| 20 | <i>Phyllanthus Emblica</i> .. | Common in deciduous forests of India and Burma. | Aula, Aonla, Nelli .. | .. | Sapwood .. | 9.02 | 1.64 | 5,093 | 9,167 | 4,508 | 28 | Do. |
| | | | | | Heartwood .. | 8.88 | 2.09 | 5,121 | 9,218 | | | |
| 21 | <i>Albizia procera</i> .. | Sub-Himalayan tract east of Jumna, S. India, Andamans and Burma. | Safed siris (Hind.), Vagai (Tam.), Sit (Burm.). | White siris | Sapwood .. | 9.41 | 1.81 | 4,782 | 8,698 | 4,652 | 0 | Do. |
| | | | | | Heartwood .. | 5.43 | 1.71 | 4,782 | 8,608 | | | |
| 22 | <i>Terminalia bellerica</i> .. | Common in India and Burma, except in arid regions. | Bahera, Bhaira (Hind.) Thitsein (Burm.). | .. | Sapwood .. | 11.49 | 4.19 | 4,763 | 8,573 | 4,882 | .. | Specimen from Dehra Dun Division. No heartwood in this specimen. |
| 23 | <i>Stereospermum suaveolens</i> . | In sal forests of India and in eng. forests of Burma. | Patal (Hind.) Kywe magyo lein (Upper Burma). | .. | Sapwood .. | 13.31 | 2.09 | 4,625 | 8,325 | .. | .. | Do. |
| 24 | <i>Bauhinia variegata</i> .. | U. P., Assam, Burma .. | Kashnar (Hind.) .. | .. | Sapwood .. | 15.48 | 3.02 | 4,648 | 8,366 | 4,013 | .. | Do. |
| | | | | | | | | | | T.P.Ghose | | |
| 25 | <i>Morus alba</i> .. | Punjab plains, Kashmir, N. W. Himalaya. | Tut, tutri (Hind.) .. | Mulberry .. | Sapwood .. | 11.03 | 1.23 | 4,600 | 8,280 | .. | 267 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood | 12.60 | 2.76 | 4,867 | 8,761 | | | |
| 26 | <i>Bauhinia retusa</i> .. | Sub-Himalayan tract, Central India. | Semla, Kandla (Hind.) .. Thaur (Gond). | .. | Sapwood .. | 12.96 | 2.38 | 4,870 | 8,766 | 3,761 | 7 | Do. |
| | | | | | Heartwood | 15.10 | 3.25 | 4,863 | 8,753 | | | |
| 27 | <i>Zizyphus pylopyra</i> .. | Common in deciduous forests of India upto 3,000'. | Kat-ber, Ghont (Hind.) Ghat-bor (Berar). | .. | Sapwood .. | 10.29 | 1.19 | 4,817 | 8,671 | 3,261 | .. | Specimen from Dehra Dun Division. No heartwood in this species. |
| 28 | <i>Ongeinia dalbergioides</i> | Northern and Central India .. | Sandan (Hind.) Timnas, Tewas (C. P.). | Sandan .. | Sapwood .. | 10.59 | 2.32 | 4,778 | 8,600 | 4,649 | 312 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood | 7.37 | 1.72 | 5,090 | 9,162 | | | |

Determination of the Calorific Values of some of the Indian Woods—contd.

| Serial No. | Scientific name. | Locality where found. | Vernacular names. | Trade names. | Description. | Moisture on the air-dry %. | Ash on the vacuum-dry %. | Calorific Values for vacuum-dried materials. | | Previous figures (Calories) Puran Singh's unless otherwise stated. | Difference in Calorific power between sapwood and heartwood Calories. | Remarks. |
|------------|-------------------------------------|---|---|-----------------------|--------------|----------------------------|--------------------------|--|--------|--|---|--|
| | | | | | | | | Calories. | B.T.U. | | | |
| 29 | <i>Grewia vestita</i> | Sub-Himalayan tract, Bengal, Central India, Burma. | Dhaman (Hind.) Pintayaw (Burm.). | .. | Sapwood .. | 12.69 | 3.01 | 4,772 | 8,590 | 4,841 | .. | Specimen from Dehra Dun Division. No heartwood in this sp. |
| 30 | <i>Odina Wodier</i> | Dry forests of India and Burma. | Jhingan (Hind.) Nabi (Burm.). | Wodier .. | Sapwood .. | 11.91 | 4.75 | 4,697 | 8,455 | 4,394 | .. | Do. |
| 31 | <i>Schleichera trijuga</i> | Dry deciduous forests of India and Burma. | Kosum (Hind.) Gyo (Burm.). | Kosum .. | Sapwood .. | 11.28 | 1.45 | 4,878 | 8,780 | .. | 34 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood | 13.33 | 1.72 | 4,844 | 8,719 | | | |
| 32 | <i>Casia Fistula</i> | Throughout the forests of India and Burma, ascending to 4,000'. | Amaltas (Hind.) Alash (Punjab). Konai (Tam.). Ngu (Burm.). | The Indian laburnum. | Sapwood .. | 12.27 | 1.35 | 5,095 | 9,171 | 4,400 | 37 | Do. |
| | | | | | Heartwood | 12.18 | 0.61 | 5,132 | 9,238 | | | |
| 33 | <i>Butea frondosa</i> | Throughout the plains of India and Burma esp. in open country. | Dhak, palas (Hind.) Porasan (Tam.). Pauk (Burm.). | .. | Sapwood .. | 13.45 | 3.12 | 4,772 | 8,590 | 3,046 T.P.Ghose | .. | Specimen from Dehra Dun Division. No heartwood in this sp. |
| 34 | <i>Cedrela Toona</i> | Punjab, U. P., Bihar, Assam, Bengal, Burma and South India in the plains and at low elevations. | Tun (Hind.) Tuni (Beng.). Thitkado (Burm.). | The Toon red cedar. | Sapwood .. | 10.70 | 2.11 | 5,058 | 9,104 | 4,577 | 10 | Specimen from Dehra Dun Division. |
| | | | | | Heartwood | 13.83 | 0.88 | 5,068 | 9,122 | | | |
| 35 | <i>Tectona grandis</i> | Peninsular India and Burma | Sagun (Hind.) Tekku (Tam.). Kyun (Burm.). | Teak .. | Sapwood .. | 10.48 | 2.38 | 4,870 | 8,766 | 4,760 | 598 | Do. |
| | | | | | Heartwood | 10.90 | 1.21 | 5,468 | 9,842 | | | |
| 36 | <i>Capparis aphylla</i> | Dry open lands of N. W., Central and South India. | Karil (Punjab) Kiral (Sind). Ker (Guzerat). | .. | Sapwood .. | 17.59 | 2.64 | 4,776 | 8,597 | .. | .. | Specimen from Sind. No heartwood in this species. |
| 37 | <i>Rhododendron Arbo- reum.</i> | Outer Himalaya from the Indus to Bhutan; hills of S. India and Burma. | Chhan (Hazara) Burans (Jaunsar). Brus (Kumaon). | .. | Sapwood .. | 18.75 | 0.55 | 4,946 | 8,903 | .. | .. | Specimen from Chakrata Division. No heartwood in this sp. |
| 38 | <i>Abies Webbiana</i> | Inner Himalaya from Indus to Bhutan. | Chitrow (N. W. Himalaya). Gobria sutab (Nepal). | Himalayan Silver Fir. | Sapwood .. | 17.71 | 0.80 | 5,100 | 9,180 | .. | .. | Do. |

APPENDIX.

| Name of species. | Evaporative power |
|--|-------------------|
| Acacia arabica (3 samples from different localities) | 6·02—8·88 |
| Acacia Catechu (13 samples from different localities) | 7·86—9·09 |
| Albizzia amara | 8·88 |
| Anogeissus latifolia (3 samples from different localities) | 7·65—9·01 |
| Bamboos (3 samples from different localities) | 7·65—8·68 |
| Boswellia serrata | 8·27 |
| Dillenia pentagyna (3 samples from different localities) | 8·18—9·29 |
| Diospyros Melanoxylon | 7·45 |
| Dipterocarpus tuberculatus (4 samples from different localities) | 8·47—8·68 |
| Eucalyptus Globulus | 8·47 |
| Eugenia Jambolana (6 samples from different localities) | 8·16—8·79 |
| Lagerstroemia parviflora (3 samples from different localities) | 8·06—8·88 |
| Lebedieropsis orbicularis | 7·86 |
| Phyllanthus Embica | 8·27 |
| Pinus excelsa | 9·20 |
| Quercus dilatata | 8·27 |
| Quercus lamellosa | 7·97 |
| Shorea robusta (9 samples from different localities) | 8·38—9·09 |
| Soymida febrifuga | 7·86 |
| Tamarindus indica (3 samples from different localities) | 8·06—8·34 |
| Terminalia tomentosa (11 samples from different localities) | 7·15—9·90 |
| Xylia dolabriformis (7 samples from different localities) | 8·06—9·29 |

ANNEXURE II.

NOTE DATED THE 1ST OCTOBER 1930, BY THE AGRICULTURAL EXPERT TO THE
IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH.

These results promise to be useful. What we really want to know is the full value of the wood, in its usual air-dry state, *i.e.*, as sold for fuel, per maund or per ton so that we can compare it with coal or cowdung cakes. It would be an advantage, therefore, if the Calorific value on the "air-dry" basis were given, as well as for "vacuum dry", when the results are published.

2. In regard to the species studied one would like to see "Babul" (*Acacia Arabica*) included and any other species which are successful in reclamation forests like those in Etawah, United Provinces.

3. We should be interested to know whether tests other than Calorific value are being made, *e.g.*, general suitability for fuel purposes, amount of smoke, odour, etc.

Butea frondosa, for example, is a wood with fairly high Calorific value and grows well on waste lands but is an unpopular fuel because of its smell.

APPENDIX XXXV.

ARRANGEMENTS FOR THE EXAMINATION OF PAPERS FOR THE
NEW JOURNALS BY SPECIALISTS AND THE PREPARATION OF
A LIST OF SUCH REFEREES.

Attention is invited to the enclosed extract from the proceedings of the Editorial Committee of the publications issued by the Imperial Council of Agricultural Research, held on the 1st September 1930, in which the Committee suggested a procedure for the examination of papers for the new Journals and the preparation of a list of such referees. As members of the Advisory Board might like to comment thereon this recommendation of the Editorial Committee is submitted to the Advisory Board for consideration. None of the proposed referees have yet been invited to serve.

M. S. A. HYDARI,

Secretary.

The 10th December 1930.

Extract from the proceedings of the Editorial Committee, held on the 1st September 1930.

Arrangements for the examination of papers by specialists and the preparation of a list of such referees.—In the past Pusa memoirs and Pusa Bulletins have all been examined by the Pusa Council and the Agricultural Adviser also possessed powers to refer any paper to an outside expert for opinion; at times this power has been used fairly freely. It was agreed that it was essential to have a number of specialists to assist the Editorial Committee in dealing with papers submitted for publication.

The procedure suggested is that on receipt of a paper it should be seen by the appropriate expert of the Imperial Council and then referred to one or more of the specialist referees. On return from the latter, if there is any doubt about the suitability of the paper or as to changes which are necessary in it, the paper should be referred to the three members of the Editorial Committee for Crops and Soils or for Animal Husbandry as the case may be. If there is no doubt as to the suitability of the paper it can be published without delay; in some cases it will not even be necessary to refer a paper to a specialist referee. In some cases it will be necessary for the specialist referee to suggest modifications in the paper. Past experience shows that it has sometimes been necessary to have the English revised, diagrams modified, number of plates reduced, etc.; these are matters for the Publication Section mainly. It is suggested that the Editorial Committee should always meet in conjunction with the meetings of the Advisory Board, either before or after as may be convenient, to deal with any matters of general importance. This course would be particularly useful during the first year of the new journals. Otherwise business will of course be carried out by circulation.

The following referees are proposed for the different branches; it may be necessary to add to this number from time to time:—

| | | | |
|-------------------------------------|----|----|--|
| <i>General Agriculture</i> | .. | .. | Mr. G. S. Henderson, Director of Agriculture, Bihar and Orissa. Mr. T. D. Stock, Deputy Director of Agriculture, Burma. (At present officiating Director.) Dr. A. E. Parr, Deputy Director of Agriculture, United Provinces. Mr. Hilson, Director of Agriculture, Madras. |
| <i>Plant and Soil Bio-chemistry</i> | .. | .. | The Professor of Bio-chemistry at the Indian Institute of Science. Mr. B. Viswanath, Madras. Mrs. Norris, Lac Research Institute. |
| <i>Physical Chemistry</i> | .. | .. | Professor Bhatnagar, Lahore. Professor Ghosh, Dacca. Mr. Charlton, Burma. Dr. Carpenter, Indian Tea Association. |
| <i>Agricultural Bacteriology</i> | .. | .. | Mr. Walton. Mr. Charlton. Dr. Harrison, a member of the Editorial Committee, will also act as referee for papers in the last three groups. |
| <i>Botany-Genetics</i> | .. | .. | Dr. Shaw. Dr. Hector. Mr. Mahta, Central Provinces. |

| | | | |
|--|----|----|---|
| <i>Botany—General and Systematic—and Horticulture.</i> | | | Professor Agbarkar (Member of the Editorial Committee). |
| | | | Mr. Milne. Dr. Burns. |
| <i>Plant Physiology</i> | .. | .. | Professor Parija. Professor Ekambaram. |
| <i>Mycology</i> | .. | .. | Dr. McRae. Mr. Rhind, Burma. Dr. K. C. Mehta. Mr. Sundararaman. Professor Ajrekar, Ahmedabad. |
| <i>Entomology</i> | .. | .. | Mr. T. Bainbrigge Fletcher. Mr. Richards. Mr. Ramchandra Rao. Dr. Chopra (of the Indian Museum). |
| <i>Agricultural Engineering</i> | .. | .. | Mr. Brownie. (Others to be added as necessity arises.) |
| <i>Veterinary Science and Animal Husbandry—</i> | | | |
| <i>Veterinary Surgery</i> | .. | .. | Mr. A. D. McGregor. Mr. Ulric Walker. |
| <i>Veterinary Medicine</i> | .. | .. | Mr. Hewlett. Mr. Taylor. |
| <i>Veterinary Pathology and Bacteriology</i> | .. | .. | Mr. Cooper (Muktesar). Mr. Krishnamurti Iyer (Madras). Mr. Shirlaw, Punjab. |
| <i>Proto-Zoology</i> | .. | .. | Col. Knowles, Calcutta School of Tropical Medicine. Mr. Mitchell, Burma. The Protozoologist, Muktesar (when appointed). |
| <i>Virus diseases</i> | .. | .. | } Mr. Haddow. |
| <i>Serum preparation</i> | .. | .. | |
| <i>Helminthology</i> | .. | .. | |
| | | | Mr. Ware. Dr. Maplestone (Calcutta School of Tropical Medicine). Mr. Bhalerao, Muktesar. Mr. Anantaramayana Rao, Madras. |
| <i>Veterinary Entomology</i> | .. | .. | Mr. Malkhani. (Mr. Fletcher for systematics when necessary.) |
| <i>Mycotic diseases</i> | .. | .. | Dr. Acton (Calcutta School of Tropical Medicine). |
| <i>Animal Bio-chemistry</i> | .. | .. | Mr. Warth. Dr. Lander. |
| <i>Animal Genetics</i> | .. | .. | Col. Matson. Mr. C. H. Parr (United Provinces). Mr. Littlewood, Madras. |
| INSTRUMENTS | | | |

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|-----------------|----|----|----|--|
| <i>Dairying</i> | .. | .. | .. | Mr. Smith. Col. Matson. Mr. Walton (for Dairy Bacteriology). |
| <i>Poultry</i> | .. | .. | .. | Mrs. Fawkes. |

Allocation of the papers to the various journals. General principles.—The wishes of the authors will be followed as far as possible. Papers describing original investigations should appear in the appropriate scientific journal and more general papers in "Agriculture and Livestock in India". A certain number of papers of the type which have hitherto appeared in the "Agricultural Journal of India" will now appear in one or other of the scientific journals and the same applies to a type of papers which in the past have appeared in the Journal of the Central Bureau for Animal Husbandry and Dairying. On the other hand some work of the type which has previously been published in the Pusa Bulletins will now go into the popular journal and not into the scientific journals. Only experience will show the extent to which the supply of material will change, but the Committee considers that in the popular journal reviews and articles describing the progress of research in special branches should appear from time to time and writers of standing should be invited to contribute such articles.

APPENDIX XXXVI.

WORLD'S GRAIN EXHIBITION AND CONFERENCE, CANADA, 1932.

The question of the participation of India in the World's Grain Exhibition and Conference, Canada, 1932, was considered by the Advisory Board at its meeting held at Simla in June 1930. The Advisory Board recommended that exhibits illustrating cereal products (for example, specimens of pedigree strains of wheat, rice and barley) should be sent to the Exhibition, that arrangements should be made for papers on the improvements effected in Indian cereal crops being circulated at the Exhibition, and that a delegate should be sent to the Conference who, in his turn, would obtain information for subsequent diffusion in India. The recommendation of the Advisory Board was accepted by the Governing Body in July 1930 and necessary arrangements for the supply of exhibits and papers are being made with the Provincial Agricultural Departments, etc. In the meantime, the attached extracts from the "Announcement and Prize List" dealing with the Conference are submitted for the information of the Advisory Board. It is for consideration on what subjects papers should be sent from India to the Conference and what authors should be invited by the Council to contribute papers.

M. S. A. HYDARI,
Secretary.

The 2nd December 1930.

Extracts from the "Announcement and Prize List".

It is the wish of the World's Grain Exhibition and Conference Executive to make the Conference representative of the World's best thought along practical and scientific lines, and to secure outstanding contributors from all countries whose experts are recognized as leaders in their particular lines. It amounts really to the organizing of a conference, that will constitute a clearing house for world thought and knowledge on every important branch of field crop production and marketing.

SESSIONS AND PAPERS.

Sessions.—For purposes of discussion relative to special branches the Conference will be divided into Sessions at the discretion of the Executive. These Sessions will run simultaneously. Each Session will have a Chairman, Vice-Chairman and Secretary appointed by the Executive Committee.

Official Languages.—The official languages will be English and French. Provision will be made for translators.

Papers.—Papers will be classified in sections as follows:—

(a) Agronomy—

Soils including physics, chemistry and bacteriology.
Cultural Problems and Methods.
Fertilizers.
Weeds.
Plant Breeding and Genetics.
Diseases of Plants.
Experimental Methods (plot work).
Seed production and registration.
Irrigation.

*(b) Insect Pests and Friends.**(c) Economics, including marketing—*

Farm management and costs.
Grading.
Merchandising and Financing.
Storage and transportation.
World markets.

*(d) Milling and Baking.**(e) Agricultural Machinery—*

Seed Cleaning.
Cultural.
Harvesting.

(f) General.

Contributors.—It is desired by the Executive Committee to have papers submitted by the best authorities available in the various participating countries. National Committees are asked to submit to the Executive proposals for the presentation of these papers. These proposals should include—

- (a)* Name of author.
- (b)* Subject of paper.
- (c)* Brief indication of the scope of the paper.

Acceptance of papers.—The decision as to suitability of papers will rest with the Executive Committee. Upon receipt of the information requested in the preceding paragraph, the Executive Committee will indicate without delay whether the papers can be accepted for presentation.

Length of paper.—The average length of papers should not exceed 2,000 words.

Illustrations.—The Executive Committee will endeavour to publish such illustrations as may accompany papers.

Résumés of papers.—It is contemplated that brief résumés of all papers will be printed in English and French and circulated to delegates in advance of the commencing of the Sessions.

Latest date for submitting papers.—All papers must be in the hands of the Executive Committee not later than January 1st, 1932. Papers received after that date cannot be considered.

Time of holding Sessions.—The various Sessions will be held simultaneously in the mornings during the Conference, commencing not later than 9:30 A.M. and adjourning not later than 12:30 P.M.

Reporting Sessions.—Reporters will be in attendance at all Sessions in order that important points brought out in discussion may be recorded.

Scientific Conference.—Should it be deemed advisable to hold a short series of purely scientific conferences, the necessary arrangements will be made for these by the Executive Committee. In the event of such conferences being held they will be arranged so that they do not conflict with the regular Sessions.

Slides and Motion Picture.—Certain of the lecture halls will be fitted with screens and lanterns for the showing of motion pictures and slides. When slides or motion pictures are to be used in connection with papers, the fact should be noted when the papers are submitted.

Report of proceedings.—The Executive Committee will print a report of the Conference proceedings. This will include the papers presented at the Sessions, and the main points brought out in the discussions. It will be impossible to print discussions in full.

Papers and Publicity.—Contributors of papers are requested to refrain from the distribution of copies for publicity purposes, pending the publishing of the "Report of Proceedings".

Separates.—Special arrangements will be made with the publishers of the "Report of the Conference Proceedings" for the printing of "Separates" of the papers appearing in the Report. The cost of these and further necessary particulars will be available later.

Changes to programme.—The Executive Committee may, as occasion arises, make such changes to the official programme as may be deemed necessary.

Matters not covered by regulation.—Any matters not covered by the foregoing regulations will be decided by the Executive Committee.

CANADA AND AGRICULTURE.

Agriculture is Canada's basic industry, and the opportunities for greater agricultural development are almost unlimited. The total land area of Canada is some 1,401,318,388 acres, and of this vast expanse 358,162,190 acres are available for agricultural use. The last census statistics give 140,887,903 acres as the occupied farm land in 1921, which is only 39.3 per cent. of the land available for agricultural production.

In 1928 the area under cultivation amounted to nearly 150,000,000 acres, and the previous year the live stock totalled 3,421,857 horses, 3,894,311 milch cows, 5,277,027 other cattle, 3,262,706 sheep, 4,694,789 swine and 50,178,455 head of poultry.

Canada's gross agricultural revenue in 1923 amounted to \$1,397,085,000 and in 1928 to \$1,730,304,000, an increase of 23.85 per cent. The gross agricultural wealth in 1923 amounted to \$7,420,410,000 and in 1928 to \$8,027,301,000, an increase of 8.17 per cent.

APPENDIX XXXVII.

OFFICE MEMORANDUM No. 2026-G., DATED NEW DELHI, THE 1ST DECEMBER 1930,
FROM THE GOVERNMENT OF INDIA, DEPARTMENT OF COMMERCE, TO THE
SECRETARY, IMPERIAL COUNCIL OF AGRICULTURAL RESEARCH.

SUBJECT :—*Revision of the publications "Dictionary of the Economic Products of India" and "The Commercial Products of India".*

The undersigned is directed to address the Imperial Council of Agricultural Research on the question whether the two publications mentioned above should be revised and republished.

2. The "Dictionary of the Economic Products of India", which consists of nine volumes and was completed in about nine years, has long been out of print and unprocurable. The question of revising the Dictionary was considered by the Government of India in 1907 and a copy of an Office Memorandum from the Department of Commerce and Industry, No. 5531-S, dated the 14th July 1906, with its annexure is enclosed, which explains the reasons which were then considered by the Government of India to exist in favour of and against the proposal to prepare and publish a revised edition of the Dictionary. It was eventually decided, with the approval of the Secretary of State, that a general revision of the work should be postponed for several years in view more especially of the fact that scientific enquiry into agricultural and veterinary subjects had only recently been organised on an adequate scale. A subsidiary proposal that, pending a general revision of the Dictionary a revised edition of it should be undertaken at once to include only those minor articles which were not included in an abridgement of the Dictionary which was then about to appear was also dropped. The abridged edition of the Dictionary was published in 1908 by Mr. John Murray under the title "The Commercial Products of India".

3. The preparation of a revised edition of the Dictionary will involve considerable expenditure and a long time in preparation, and this Department is provisionally of opinion that a new edition of "The Commercial Products of India" would render unnecessary a revision of the Dictionary. Before arriving at a final decision in the matter, however, the Commerce Department would be glad to be favoured with the views of the Imperial Council of Agricultural Research on the question whether the "Dictionary of the Economic Products of India" or "The Commercial Products of India" or both should be revised and republished and, if so, regarding the lines on which such revision should be undertaken. The Commerce Department would also be glad of the advice of the Imperial Council of Agricultural Research regarding the plan which should be followed in preparing a revised edition, e.g., whether the continuous alphabetical arrangement should be preserved or whether any new publication should be divided into sections for the various classes of products (mineral, agricultural, manufactures, etc.).

Copy of Office Memorandum No. 5531-S, dated Simla, the 14th July 1906, from the Government of India, Department of Commerce and Industry, to the Department of Revenue and Agriculture, Government of India.

With reference to the correspondence ending with the endorsement from the Department of Revenue and Agriculture, No. 331-84-L., dated the 20th February 1906, the undersigned is directed to request that the opinion of the Board of Scientific Advice may be obtained regarding the revision of the Dictionary of the Economic Products of India. The main issues for decision are three in number :—

- (1) whether a revised edition of the Dictionary should be started at the present time, or whether it should be postponed for a few years ;
- (2) the best plan to adopt for carrying through such a revision ;
- (3) the best scheme of arrangement for the revised edition.

The answer to the first of these questions depends largely on the decision which may be arrived at on the second point, which must therefore be considered first.

2. There would seem to be three possible plans for the preparation of a revised edition of the Dictionary :—

- (a) By a single author who is given the necessary literary assistance, and who may be able to secure the co-operation of a certain number of specialists for writing some articles.
- (b) By the several Departments of Government concerned, under the guidance of an Editor.
- (c) By a special staff consisting of an Editor-in-Chief and Assistant Editors chosen for their knowledge of special branches of the work and their Indian experience (together with literary skill) who would also be able to secure the co-operation of specialists for the preparation of some articles.

A fourth scheme was suggested by Sir W. T. Dyer in 1899, *viz.*, that the work should be revised volume by volume as a part of the regular work of the office of the Reporter on Economic Products. It is thought that this plan is not feasible and may be put aside at once. It would be impossible for the Reporter to undertake this duty in addition to his ordinary work.

3. The first plan is that which was followed in the preparation of the present edition, and it is apparently the course which the authorities of the India Office are disposed to approve as the natural method of revision. Sir George Watt who prepared the former edition, and is probably the only man who could be entrusted with revision of the Dictionary on this plan, is available, possesses exceptional qualifications for the task, and is believed to be anxious to undertake the work. On the other hand there are serious objections to this scheme. It is likely to result in a work of very unequal merit, for a single man cannot be competent to deal authoritatively with all the numerous products, and must in many cases be a compiler of material of which he cannot judge the relative value. The present Dictionary, although a remarkable work of great merit, shows this defect very prominently. Moreover, as Sir George Watt will not return to India, the work would have to be carried out in England, probably under the supervision of the authorities at Kew, while the experts whose assistance would be given would for the most part be resident in India. The disadvantages of such an arrangement in preventing personal communication between the Editor and his assistants are obvious, and an Editor in England would find it difficult to exercise the necessary supervision over specialists six thousand miles away. The almost inevitable absence from India for long periods of the Ledger files of the Reporter on Economic Products would be a most serious inconvenience, as has already been found in the case of the Abridgment where great difficulty has also been met with to arrange for the despatch of files at proper intervals so as to admit of their prompt return to India. The delays inherent in this system would also be likely to prevent the completion of the work within a reasonable period. In view of these facts it has been strongly represented that the revision ought to be carried out in this country.

4. The second plan has much to recommend it on the score of cheapness. The Editor would reside in India, and would be responsible only for the general arrangement and literary form of the work. It is feared, however, that it would throw an impossible burden upon some Departments. The present Dictionary fills some 5,200 pages of print which may be taken as the minimum size of the revised work. It is estimated that about two-thirds of the matter, approximately, would appertain to the Department of Agriculture, and it is understood that the present staff of the Department could not, unless special assistance were given, prepare a revised edition of 3,500 pages of print without neglecting practically all the present work of the Department. The Forest Department would probably be in the same position. The Geological

Department would be in a better position, as it has nearly completed an independent revision of its Manual of Economic Geology, but even so the re-arrangement of this material and its preparation in a form suitable for inclusion in the Dictionary might be a task of some magnitude. The other officers most intimately concerned are the Director General of Commercial Intelligence, the Inspector General of the Civil Veterinary Department, the Director of the Botanical Survey, and the Director General of the Indian Medical Service. It has been urged that if the revised edition is to be a real standard reference work of authority, and not merely an ill-digested summary of available information, none of these Departments is so strong that it could be expected to undertake such a duty without additional assistance.

5. The third plan, though much the most expensive of the three, is the one which on general grounds appears the most suitable, and the only one by which the work could be completed within a reasonable period from its commencement. A scheme of this nature is almost universally adopted for the preparation of works of this kind. The acceptance of this arrangement, however, involves the postponement of the commencement of the work for some time, and it is therefore necessary to consider whether the delay can be agreed to.

6. In a Resolution passed on the 31st January 1905 the Advisory Committee of the Royal Society expressed the hope that, as the present edition of the Dictionary was out of print and unprocurable, a revised and new edition might be put in hand as soon as practicable. This Resolution was referred by the Secretary of State to the Government of India, who consulted the Board of Scientific Advice. The Board agreed generally with the Committee, but were of opinion that it would be convenient to defer the preparation of the revised edition until the abridgment now under compilation had advanced towards completion. Both these opinions are in favour of the early revision of the Dictionary, and much weight must attach to them; and if it were decided that Sir G. Watt should be asked to undertake the preparation of the new edition, there would be no reason for postponing the start. It must also be admitted—

- (1) that the present edition is out of print,
- (2) that an amount of information has been accumulated quite sufficient to justify its embodiment in a new edition,
- (3) that there is a danger that, if the work is postponed too long, the accumulation will tend to become unwieldy and the labour involved in revision greatly increased.

On the other hand it has been suggested that so far as the Agricultural Department is concerned, it would be much better to postpone the revision for four or five years. The Department is only now being equipped with an adequate staff, and is commencing the systematic investigation of agricultural products. A revision based on the information available at present might be out of date as regards agricultural products in a very few years, and would demand to be revised afresh. It has also been pointed out that the abridged handbook will to some extent meet the public demand, and obviate the inconvenience of the Dictionary being out of print. Finally it must be said that if either the second or the third plan is adopted, the immediate preparation of the revised Dictionary is an impossibility. When the expert agricultural staff both Imperial and Provincial is complete, and has had time to become familiar with Indian conditions, it should be possible to select men specially fitted for the work and relieve them of their ordinary duties, but meanwhile their whole energies must be devoted to the ordinary Departmental tasks.

7. The scheme of arrangement for a revised Dictionary demands consideration. It will have to be decided whether the alphabetical arrangement of the former Dictionary should be adhered to, or whether it should be divided into a number of parts, say, for Animal, Mineral and Vegetable products. It has been

suggested, indeed, that the Dictionary should not be revised in its present form, but that the different Departments should undertake the preparation of suitable manuals or works of reference in respect of the subjects with which they deal. Thus the Manual of Economic Geology which is nearly complete may contain all the information necessary with regard to minerals. The alphabetical arrangement is undoubtedly the more convenient for purposes of reference and is supported by the high authority of Sir W. T. Dyer, a copy of whose letter, dated the 8th June 1899 is attached to this memorandum for facility of reference. On the other hand the preparation of separate manuals for each Department would prevent the postponement of the whole work until all the Departments were ready to take up the task of revision. It is of course impossible to consider the details of the scheme at present but the general lines of procedure should be laid down.

Copy of letter from Sir W. T. Thiselton-Dyer, to the Under Secretary of State for India, dated Kew, the 8th June 1899.

I have the honour to acknowledge the receipt of Sir Charles Bernard's letter of 7th June (R. and S. 1645), forwarding a copy of a letter from the Government of India relating to the revision of the Dictionary of Economic Products.

2. It cannot be doubted that in this work India possesses for the first time in an accessible form a digest of the information which has been gradually acquired with regard to its material resources, but which has hitherto been scattered in innumerable publications as well as in official documents and papers not readily available for consultation.

3. The preparation and production of such a work has necessarily not merely stimulated further investigation, but it has revealed points on which further information is needed. The Dictionary, from the nature of things, cannot ever be expected to reach a final form, but from time to time will need bringing up to date. If, however, the office of the Reporter on Economic Products is organized, as it should be, on a permanent basis, the work of successive revision should be neither laborious nor difficult. It appears to me that the time has come when Dr. Watt should be supplied with a younger man as assistant, who may possibly succeed him, or at any rate preserve some continuity in the work. It is obvious that the duties of the Reporter have two sides; on the one hand he is necessarily engaged continuously in the study of Indian Products; on the other in posting up and revising the Dictionary. It is clear that, if single-handed, one or other must from time to time suffer as each in turn becomes the predominant object of his attention. It is further to be feared that, in the event of Dr. Watt's retirement, there would be a deplorable break in continuity with regard to both. But the day has long gone by when India can afford to mark time in anything that relates to her material welfare.

4. The mode in which the revision of the Dictionary should be accomplished is, perhaps, a matter to be most properly settled by the Government of India, after due consideration to local circumstances and conditions, which can hardly be satisfactorily discussed at home. But speaking as one who has the Dictionary in constant use and who feels a deep debt of gratitude for its production, I should deprecate any change in its form. The bibliography should be rather augmented than curtailed, and I attach much importance to the citation of the *ipsissima verba* of the extracts from the authorities quoted. Personally I am in favour of the retention of the exact form of the present work, and I am disposed to support the suggestion that "revision should be continuous and that one volume should always be in hand." It seems to me that this diminishes the formidable aspect of such a task as attempting to recast the whole work and would appreciably diminish the burden of even a more limited revision. Each revised volume would take the place of its predecessor. Sets in office use would remain available for practical purposes of

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consultation and everything accomplished would be so much to the good. Space for the introduction of new matter might be found by the judicious compression of the longer articles on such subjects as tea, which might eventually be made the subject of more copious handbooks. It is not so much for these as for the little-known and obscure products that the Dictionary is so invaluable as a work of reference.

5. I am most strongly of opinion that a synoptical abridgment in one volume is most desirable. Such an abridgment should be indispensable to every administrative officer who has to deal with agricultural and commercial matters, but whom in a vast number of cases it would be unnecessary to supply with the large edition. Moreover, it could be kept up to date, especially with regard to statistical matter, almost annually. This would save the necessity of a more frequent revision of the larger work.

6. With regard to the Agricultural Ledger Series, I have no doubt that its form has been determined upon after careful consideration of the practical needs of India. I can quite understand that it is convenient to issue from time to time, in the form of a separate pamphlet, information for wide distribution on special subjects. In this respect India follows the example of the United States Government. It cannot be denied that the form of the Agricultural Ledger Series in this respect has its advantages. Many of the articles are, however, very fragmentary, and I doubt the practical advantage of issuing these in a separate form. Personally, I think the Agricultural Ledger Series very troublesome to consult. The information contained in it is, therefore, apt to get out of sight. I am disposed to think that the heads of information enumerated in the letter of the Government of India would be much more available for consultation and study if collected in a bi-monthly bulletin or journal. These should, in turn, be collected into annual volumes with a good index. A further collective index might be published quinquennially. I may point out that nearly every Colonial Government now issues an Agricultural Journal, in which such articles as are now comprised in the Agricultural Ledger Series are published collectively, together with briefer notes on matters of general interest, for which at the present time, in the publications of the Government of India, there seems to be no provision. The publication of such a continuous journal would not militate against the separate distribution of special articles.

APPENDIX XXXVIII.

SCHEME FOR THE IMPROVEMENT OF THE CASTOR CROP IN INDIA.

The average acreage under castor in H. E. H. the Nizam's Dominions calculated from the last five years' figures is over 600,000 acres. This is believed to be quite 50 per cent. of the acreage under castor in India and a very large proportion of the castor grown in the world. Hyderabad is, therefore, the most appropriate place to work out the improvement of the castor crop. It has the further advantage of possessing two entirely different classes of soil on which castor is grown, viz., the black cotton soils of the Deccan and the light gravelly soils of the southern peninsula. The great bulk of the commercial crop in Hyderabad is grown on the latter soils in the Telugu districts. The outturn per acre is poor, but little is spent on the crop and it brings in a better return than anything else.

2. In view of the importance of the crop to Hyderabad, the Department of Agriculture has already started work on it, and the Economic Botanist has been engaged on this crop for more than two years. Considerable promise of success has already been obtained. Already some individual plants have been selected which though not yet quite pure for all the desirable characters have nevertheless given a good yield of seed with satisfactory oil content, and it is hoped that within a season or two these can be purified and after multiplication the seed may be distributed to cultivators who thereby will get an yield of at least three to four times their present outturn. Although this work will be of great use to cultivators in the surrounding provinces where soils are similar to those of Hyderabad, still there are other parts of India such as the Gangetic valley where the soil conditions are quite different. Hyderabad would, however, be far the best centre in the whole of India for conducting research into this crop, and it will not be difficult to increase the expenditure on the work now in hand to obtain results which would be useful not only to the surrounding provinces but to the whole of the rest of India. It will be necessary first of all to collect as many types of samples of castor as possible from the various parts of British India and also as many of our samples as can be obtained, together with information about the respective conditions of soil, moisture, temperature, manure, trade requirements, etc., and to grow these samples at one of the main farms of the State near Hyderabad. The following breeding and cultural work will also have to be done :—

Breeding.—(1) Isolation and subsequent testing of the unit species from the various varieties of castor grown in India, i.e., isolation of pure lines for all the possible morphological characters and (2) analysis of the factors which make up yield such as the branching habit, the number of male and female flowers in each spike, etc., etc., (3) study of the variation of oil content from plant to plant in the same pure lines, from spike to spike in the same plant and from seed to seed in the same spike in all the different unit species and (4) study of pollination in castor.

General.—(1) Study (largely by pot cultures) of the influence of environmental factors, such as soil moistures, manure-nitrogen, phosphorus, air temperature, etc., on the nature of the flowers produced and the yield of seed and oil content obtained; (2) date of sowing trials to determine the best time for sowing and (3) spacing trials to determine the most suitable spacing for different types.

3. This will mean a grant for additional staff and equipment which it would not be justifiable for the Government of Hyderabad to incur for its own purposes. At present a sum of Rs. 35,935 is being spent annually on the work of the Economic Botanist, apart from the expenditure on a special Cotton Botanist, which is being borne by the Indian Central Cotton Committee. The Economic Botanist has also been provided with the necessary equipment and a laboratory for him is under

course of construction. If the work is to be expanded so as to place it on an all-India basis, it will be necessary to incur additional expenditure amounting to Rs. 9,350 non-recurring and Rs. 15,892 recurring. The latter will be the average expenditure over a period of five years which is the least, for which it will be of any use to undertake these investigations. It is difficult to estimate how much exactly is being spent on the castor crop alone by the Hyderabad Government. The Economic Botanist is now working on four crops, but the castor and paddy crops take up much more of his time than his work on wheat and jowar. In the circumstances, it will no doubt be thought that the State Government is already spending a sufficient amount year by year on this work and that the remainder of the sum now required might be borne by the Research Council. Of the non-recurring expenditure, Rs. 4,750 will be required for equipment and a temporary shed which, in accordance with the rules approved by the Governing Body, would be borne by the Research Council and H. E. H. the Nizam's Government will have to be responsible for the balance.

4. It is hoped that in view of the work which H. E. H.'s Government are already undertaking on this crop which is bound to be beneficial to the surrounding provinces in any case, the Agricultural Research Council will be ready to undertake an average liability of Rs. 15,892 for the next five years as well as to meet non-recurring expenditure to the extent of Rs. 4,750.

(Sd.) B. A. COLLINS,

Director-General of Commerce and Industry,

H. E. H. the Nizam's Government.

Dated Hyderabad-Deccan,

December 7, 1939.

Expenditure in connection with the scheme for the improvement of castor crop in India.

| | <i>Non-recurring.</i> | <i>Recurring average of 5 years.</i> |
|---|-----------------------|--|
| | Rs. | Rs. |
| I. Capital expenditure— | | |
| (a) Additional laboratory accommodation .. | 3,000 | |
| (b) Ideal fencing for 4 acres .. | 1,600 | |
| II. Staff— | | |
| (a) Technical assistants. Two for botanical and breeding work each at Rs. 200—20—300 .. | | 6,384 |
| (b) Seven plant collectors at Rs. 40—2—50 each .. | | 3,948 |
| (c) Clerical staff. One clerk and computer at Rs. 80—5—100 .. | | 1,140 |
| (d) Menial staff. 2 peons at Rs. 15 each per mensem .. | | 360 |
| III. Allowances— | | |
| (a) Travelling allowance .. | | 1,200 |
| (b) Conveyance allowance to the staff .. | | 460 |
| IV. Equipment— | | |
| (a) Apparatus .. | 2,000 | |
| (b) Furniture .. | 1,000 | |
| (c) Typewriter .. | 750 | |
| (d) Shed for pot culture .. | 1,000 | |
| (e) Breeding requirements such as selfing bags, seed bins, etc. .. | | 1,200 |
| V. Miscellaneous contingencies .. | | 600 |
| VI. Extra labour .. | | 600 |
| Total .. | 9,350 | 15,892 |

**THE MADRAS PROVINCIAL CO-OPERATIVE UNION,
ROYAPETTAH, MADRAS.**

15th February 1932.

To

The Secretary,

The Madras Provincial Co-operative Bank, Ltd.,

Luz, Mylapore, Madras.

SIR,

I have the honour to submit herewith a consolidated report, for the three years ending 30th June 1931, on the working of the several Rural Reconstruction Centres, the management and supervision of which was entrusted to the Provincial Co-operative Union.

I have the honour to be

Sir,

Your most obedient Servant,

V. VENKATASUBBAIYA,

Secretary.

REPORT ON THE WORKING
OF
THE RURAL RECONSTRUCTION CENTRES
RUN BY
The Madras Provincial Co-operative Union.

The XVIth Madras Provincial Co-operative Conference, which met in April 1928 at Rajamundry, adopted the following resolution regarding Rural Reconstruction through the help of co-operative institutions:—

“ This Conference resolves (a) that the Provincial Co-operative Union, in co-operation with the Madras Central Urban Bank, District Banks, and District Federations, should take immediate steps to start at least six Rural Reconstruction Centres in the Presidency and to bring about a co-ordination of the work of the Agricultural, Co-operative, Labour, Industries, Hygienic and Educational agencies for a collective programme of regional development being initiated; and (b) that some competent Rural Reconstruction supervisors be trained for the work ”.

The circumstances that led to the adoption of this resolution may be briefly narrated. The Y. M. C. A. under the leadership of the late Mr. K. T. Paul organised a Rural Department in 1923 and started four centres in South India—at Indukurpet in Nellore District, at Ramanathapuram near Coimbatore City, at Areacode in Malabar District and at Marthandam in the Travancore State. The work of these centres began to attract public attention in an increasing degree. The Servants of India Society also started a centre in Malabar in the Moplah area and another at Ullagaram in Chingleput District. The work of the Rural Department of Dr. Tagore's Viswabharati University and the brilliant work of Mr. F. L. Brayne, Deputy Commissioner of Gurgoan District in the Punjab, known as the “Gurgoan Experiment”, carried on with the full backing of Mr. Brayne's official position, had an inspiring effect in this Presidency. Under the Village Panchayats' Act of 1920, passed

expressly for the development of rural areas, a large number of Panchayats were started all over the Presidency and fostered by Government with special grants made available to them through the Registrar General of Panchayats for the promotion of communications, education and water supply. The District Boards of Chingleput and West Godavari appointed specially trained supervisors for organising village panchayats and also opened classes for training teachers as village guides on the model of the Gurgaon Experiment. The Congress, the largest and most potent political organisation in the country, adopted a constructive programme, approved a scheme of rural reconstruction drawn up by the late Mr. C. R. Das and pushed on with vigour the production of Khaddar as a subsidiary rural industry in every province. When Mr. A. Ranganatha Mudaliar became the Development Minister in 1927, he set apart a liberal sum from his salary for the support of rural centres where an organised attempt in the spheres of demonstration and experiment was to be made in co-ordinating the various governmental and non-governmental agencies, so that the results might be available for action by the State later. In August 1927, the Y. M. C. A. organised at Madras a Rural Reconstruction Conference and Exhibition to focus attention on the subject, and it was participated in by officials, co-operators, missionaries and all other agencies interested in rural welfare.

If the various attempts mentioned above roused the interest of the general public of the Presidency in rural reconstruction, they did so in a particular degree the interest of co-operators. The co-operative movement was introduced in India mainly for the benefit of the rural population. In every scheme of rural reconstruction an important place was given to the co-operative society. Rural Reconstruction, or the material and moral improvement of the country side, well expressed in the triple formula of the Irish Co-operators, "Better Living, Better Farming and Better Business," is as much, if not more, the concern of co-operators as of any other body of workers in the social and economic field. This being so, the results achieved in the Alamuru area, in East Godavari District, by the development of co-operative societies under the leadership of Mr. N. Satyanarayana, not only in the shape of co-operative development but also in such directions as the organisation and efficient working of village panchayats, the decrease in litigation and the drink evil, increase in attendance in schools and the spread of libraries—proved specially gratifying and stimulating to co-operators. What was possible at Alamuru ought to be possible elsewhere also,

if a worker of the right type was made available and attention was concentrated on a small area. The Provincial Bank and the District Banks usually set apart a portion of their profits as Common Good Fund which is available for propaganda, education and sanitation, and what can be a better object for the expenditure of this Fund than the starting of rural reconstruction centres? It was reasoning like this that led to the adoption of the resolution quoted above by the Provincial Conference of Co-operators.

In pursuance of this resolution, Mr. V. Ramadas Pantulu, President of the Madras Central Urban Bank (now Provincial Co-operative Bank) and of the Madras Provincial Co-operative Union, drew up a scheme. It is appended to this report. (Appendix A.) The chief features of the scheme were :—

- that three of the centres should be opened in the Andhra districts and three in the Tamil districts;
- that the area of the centre should be limited to a radius of about 7 miles from the village chosen as the centre;
- that the centre should be started in a district where the District Co-operative Bank agreed to contribute for its maintenance a sum of Rs. 1,000 per year, a like amount being contributed by the Madras Central Urban Bank;
- that a trained supervisor should be appointed for each centre on a pay of Rs. 50—5—75 with a fixed travelling allowance of about Rs. 15 and that he should be given a peon;
- that the general supervision of all the centres should vest in the Provincial Co-operative Union, and the immediate supervision of each centre with a local committee;
- that the object of the workers should be to awaken and organise the people for self-help rather than do things for them; and
- that the main items of work to be attended to should be the improvement of co-operative societies, the starting of panchayats and helping them in all ways, promotion of cottage industries, specially hand-spinning and hand-weaving, and the amelioration of the depressed classes.

The scheme was duly approved by the Madras Central Urban Bank and the Madras Provincial Co-operative Union. The District Banks were then invited to take advantage of the scheme. There was response from the Krishna, Nellore, Bellary, Anantapur, South

Arcot and Salem districts. In Salem district a scheme for the intensive development of co-operative societies in Rasipuram Taluk was in operation under the direction and supervision of M.R. Ry. Diwan Bahadur R. Ramachandra Rao Avl., C.S.I. His proposal to start a centre at Elur in Rasipuram Taluk, to confine the work to that village and to go on without a special local committee was accepted by the Provincial Co-operative Union as a special experiment. Local committees were appointed in other districts and they were requested to select the centres and suggest suitable persons for appointment as supervisors. The names of the members of the local committees are mentioned in the sections dealing with the various centres which follow. Arrangements were made for training the supervisors in co-operative and panchayat work before they were placed in charge of the centres. For co-operative training the supervisors were asked to join the training class organised by the Provincial Co-operative Union between September and December 1928. But by that time supervisors had been appointed only for four centres. The supervisor for Elur in Salem District was given training by Mr. Ramachandra Rao himself along with other supervisors intended for work in the Rasipuram Taluk and so he was not required to attend the Provincial Co-operative Union's training class. The supervisor appointed in Bellary district was unable to attend the class owing to personal reasons (later on his services had to be terminated) and so only those intended for the Krishna and Nellore districts attended the P.C.U training class. The Registrar-General of Panchayats, who had been approached to give training to the supervisors in panchayat work, was however unable to comply with the request and so the training in panchayat work was not given. For the centre in South Arcot District the services of an experienced co-operative supervisor were secured. The new supervisor of the centre in Bellary district underwent training in the summer school held at the Ramanathapuram Y.M.C.A. centre in 1929. The dates when work was actually started in the various centres are given in the review of the work of the respective centres, but it may be said generally that it was only after July 1929 that the centres began to work normally.

About the end of 1929 the Madras Central Urban Bank raised its grant from Rs. 6,000 to Rs. 9,000 and made the maintenance of 9 centres under the scheme possible. Alamuru, which hitherto was dealt with separately by the Madras Central Urban Bank, now came under the scheme. For the remaining two centres applications were received from Ramnad and Guntur Districts and were approved.

The centre in Ramnad district commenced to work in July 1930. The opening of a centre in Guntur district was postponed owing to the conditions and atmosphere requisite for its successful working having been absent during the active pursuit of the Civil Disobedience movement in that district. Since the return of normal conditions with the Gandhi-Irwin pact, steps are being taken to open the centre, but lack of harmony among the co-operators there however stands in the way of the scheme being inaugurated.

When the Provincial Co-operative Union agreed to supervise the centres under the scheme, it appointed a special committee consisting of the following gentlemen to look after the work, with Mr. V. Venkatasubbaiya, one of the Secretaries of the Provincial Co-operative Union, as its convener.

1. The Hon'ble Mr. V. Ramadas Pantulu.
2. Diwan Bahadur R. Ramachandra Rao.
3. A. Ranganatha Mudaliar.
4. Rao Bahadur M. K. Venkatachariar.
5. Diwan Bahadur M. Ramachandra Rao.
6. Mr. K. G. Sivaswamy.
7. „ E. S. Sunda.
8. „ Rao Sahib T. Srinivasa Rao.
9. „ K. C. Ramakrishnan.
10. „ K. L. Narasimha Rao.
11. „ V. Venkatasubbaiya (Convener).
12. „ N. Satyanarayana (Joint Convener)

In July 1930 the bye-laws of the Provincial Co-operative Union were amended so as to give a place to its Rural Reconstruction Committee in the constitution itself. The bye-law relating to it is:—

“ A Central Committee for the regulation of the work of the rural reconstruction centres and of the local committees thereof shall be constituted with seven members including the President of the Provincial Co-operative Union who shall be an ex-officio member thereof. At least four out of the 7 members shall be elected residents of Madras. One member shall be elected by the Executive Committee of the Provincial Co-operative Union. ”

The following are the present members of the Committee :—

- | | | |
|----|--|--|
| 1. | Messrs. K. M. Singaravelu Mudaliar, | } Elected by the Execu- tive Com- mittee of the M.P.C.U. |
| 2. | „ C. V. Venkataramana Iyengar, | |
| 3. | „ S. Subba Rao, | |
| 4. | „ N. G. Ranga, | |
| 5. | „ Rao Bahadur A. Vedachala Iyer, | |
| 6. | „ N. Satyanarayana (Elected by the Provincial Bank). | |
| 7. | „ V. Ramadas Pantulu (ex-officio). | |

Mr. V. Venkatasubbaiya is the Secretary of the Committee. He has been visiting the centres periodically and keeping himself in touch with the local committees and the supervisors. The Committee of the Provincial Co-operative Union has issued instructions to the supervisors for their guidance which are appended to this report (Appendix B.)

Each centre has been supplied with a few books including the *Manual of Co-operation* and *Report on Cottage Industries in Madras Presidency*, and also a gramophone and a few plates. Suitable magic lanterns have been specially made at a very moderate cost and are being supplied.

A physical instructor with training in scouting was appointed in the latter part of 1930 with a view to his being sent round to the various centres for starting scout troops and organising physical activities. He was sent to Alamuru in November 1930 and worked there till the end of June 1931, when his services were placed at the disposal of the Ramadas Co-operative Training Institute at Rajahmundry which has opened a special class for the training of rural welfare workers. The class will last till the end of December 1931.

The work of the centres has been hampered by two unforeseen factors, the Civil Disobedience movement or Salt Satyagraha as it is called and the acute economic depression. Between March 1930 and April 1931 the whole country was in the throes of an acute political struggle. So far as our Rural Reconstruction centres were concerned, those in Kristna and Godavari districts suffered seriously by the supervisor and two out of the three local committee members in Kristna district and a member of the local committee and the temperance pracharak of Alamuru centre being sent to jail. Meetings could not be held, and even normal educative work was rendered extremely difficult owing to the extensive use of Section 144 Cr.P.C. This was true also of the other centres though to a much less extent. The present economic depression has affected the centres in more ways than one.

Several district co-operative banks have been unable to collect fully even their interest dues from the primary societies, and thus worked at reduced profit; they have not therefore been in a position to contribute from their Common Good Fund moneys for the upkeep of the centres which were started on the assumption that their continued support would be forthcoming. Local Committees have therefore had to be advised to raise funds from all available sources, and the Madras Central Urban Bank's grant was made proportionate to local collections. The rectification and consolidation of societies has also been rendered difficult by the extremely low prices of agricultural produce and the consequent inability of the ryots to meet their obligations to the societies. Enterprise, a hopeful outlook and a desire to improve one's self and one's surroundings have been on the wane. People are too worried about their individual difficulties to think of the commonweal. Allowance has to be made for these factors in judging the work of the centres as a whole.

The activities adopted generally in all the centres are:—(1) to help and improve co-operative societies, (2) to organise and help in every way village panchayats, (3) to popularise subsidiary industries, such as hand-spinning and poultry-keeping, (4) to arrange for agricultural demonstrations, (5) to mitigate the drink evil by prohibition propaganda and other suitable means, (6) to promote adult education by starting libraries and other means and (7) by general propaganda to rouse the people to useful action. The difficulty felt in improving co-operative societies owing to the economic depression has already been referred to. A fair amount of success may be said to have attended the organisation of panchayats. The works they undertake depend partly on the urgency of the need to be catered to and partly on the general economic prosperity of the area. The production of khaddar made satisfactory progress, for which the spirit of the times was a great aid. The attempts to introduce poultry in two centres, after the supervisors underwent training in poultry keeping, did not prove successful. Agricultural demonstrations succeeded in some cases and failed in others. Prohibition propaganda was carried on energetically and produced good results. As a result of the general propaganda and the circulation of books and newspapers, a certain degree of popular awakening is witnessed in all centres, which perhaps is the chief result to be looked for in such attempts. The supervisors have generally been found to be suitable men, but special mention must be made of the favourable impression which Mr. V. Ramachandra Rao, B.A., B.L., of the Lepakshi centre in Anantapur District has made, not only on

people of all classes in the villages included in the centre, but also on the general public of the district, by his giving up a career at the Bar for becoming a rural missionary and by his zeal and devotion to work. Moral results, which are no less valuable than material results, are beginning to be seen in the various centres, and progress may well be expected to be more rapid in the future.

A statement of the expenditure incurred each year on the different centres and by the Rural Reconstruction Committee of the Provincial Co-operative Union is given below :—

Statement of Expenditure on the Rural Reconstruction Centres and the Central Committee of the Provincial Co-operative Union for 3 years ending 30—6—1931.

| Name of the Centre. | 1928—29 | | | 1929—30 | | | 1930—31 | | | Total | | |
|--|---------------|----------|----------|---------------|-----------|----------|---------------|----------|-----------|---------------|----------|----------|
| | Rs. | A. | P. | Rs. | A. | P. | Rs. | A. | P. | Rs. | A. | P. |
| 1. Lepakshi ... (Anantapur Dt.) | ... | | | 1,605 | 0 | 0 | 1,784 | 6 | 0 | 3,389 | 6 | 0 |
| 2. Maipangudy... (Bellary Dt.) | 692 | 13 | 5 | 1,430 | 14 | 0 | 724 | 15 | 0 | 2,848 | 10 | 5 |
| 3. Alamuru ... (E. Godavari Dt.) | 4,021 | 3 | 5 | 2,258 | 8 | 6 | 2,273 | 3 | 6 | 8,552 | 15 | 5 |
| 4. Gudlavalleru... (Kistna Dt.) | 516 | 12 | 0 | 1,318 | 6 | 6 | 497 | 5 | 5 | 2,332 | 7 | 11 |
| 5. Indukurpet ... (Nellore Dt.) | 495 | 5 | 6 | 1,580 | 6 | 8 | 1,287 | 14 | 0 | 3,363 | 10 | 2 |
| 6. Maharaaja- puram (Ram- nad Dt.) | ... | | | 1,094 | 2 | 0 | 2,121 | 8 | 6 | 3,215 | 10 | 6 |
| 7. Elur ... (Salem Dt.) | 5,422 | 0 | 5 | 8,278 | 1 | 6 | 8,944 | 1 | 5 | 22,644 | 3 | 4 |
| 8. Tirupachanur. (S. Arcot Dt.) | 251 | 13 | 0 | 1,511 | 15 | 0 | 916 | 4 | 0 | 2,680 | 0 | 0 |
| 9. Central ... Committee | 779 | 6 | 6 | 1,262 | 4 | 3 | 3,007 | 14 | 0 | 5,049 | 8 | 9 |
| Total ... | 12,179 | 6 | 3 | 20,339 | 10 | 5 | 21,557 | 7 | 10 | 54,076 | 8 | 6 |

8.(a)

The amount mentioned against Elur in Salem District represents not only the expenditure incurred at Elur but also that incurred on the intensive co-operative development of the whole of Rasipuram Taluq, the work at Elur being a part of that scheme.

It will be seen that the expenditure on the centres is not uniform. It is so because the centres were started on different dates and also because some of the district banks were unable to make the full contribution in the second and third years and the Madras Central Urban Bank's contribution was made proportionate to their contribution. The Provincial Co-operative Union retained with itself Rs. 250 and passed on Rs. 750 out of the grant of Rs. 1,000 sanctioned by the M.C.U.B. per year per centre. Out of the sum so retained by the P.C.U. were met the travelling expenses of the committee members and of the Secretary for his visits to the centres, the salary of the physical instructor and a portion of the pay of one member of the staff in the P.C.U. The contribution towards the last item has now been reduced from Rs. 50 to Rs. 25 per month. A sum of Rs. 1,000 was granted with the sanction of the Provincial Bank to the Ramadas Co-operative Training Institute for meeting its expenses in connection with the conduct of the rural workers training class, which it has opened since 1st July 1931. The Provincial Co-operative Union has further helped the training class by lending free to it the services of its physical instructor.

2. ALAMURU.

The Alamuru Rural Reconstruction Centre as an institution came into existence in June 1927. For about ten months it received aid from Mr. A. Ranganatha Mudaliar's Rural Reconstruction Trust at the rate of Rs. 50 per month. When that Trust was dissolved in April 1928, on the resignation of his Ministership by Mr. Ranganatha Mudaliar, the centre applied for and obtained aid from the Ramachandrapuram Central Bank and the Madras Central Urban Bank. Meanwhile, the work of this centre, based as it had been on the success of co-operative societies, attracted the attention of the leading co-operators of the province and led to the passing of the resolution at the 16th Provincial Co-operative Conference held at Rajahmundry, in pursuance of which the present scheme was drawn up and accepted in 1928. From July 1929, that is the second year, the Alamuru Centre came naturally under the scheme, no separate and independent grant being made by the Madras Central Urban Bank towards its upkeep.

Local Committee :—The Ramachandrapuram Central Bank formed a local committee consisting of the following gentlemen to look after the centre :—

| | |
|---|----------------------|
| Messrs. N. Satyanarayana—(Superintendent of the Centre) | |
| „ N. Kameswara Rao | ... Alamuru |
| „ P. V. Subba Rao | ... Pedapalla |
| „ P. Bhaskara Rao | ... Narsipudi |
| „ M. Suryanarayana | ... Jonnada |
| „ K. Buchayya | ... Kapileswarapuram |

This Committee was in office from April 1928 to September 1931. When it was learnt that the Ramachandrapuram Central Bank was not continuing its grant for the centre, the Rural Reconstruction Committee of the Provincial Co-operative Union resolved to appoint a new committee consisting of the following gentlemen :—

1. Mr. N. Satyanarayana, Alamuru
2. „ Y. Doriah „
3. „ Surappa Reddi Veeraswamy Garu (Sandhipudi)

The following villages are included in the area:—

(1) Alamuru, (2) Jonnada, (3) Mulasthanam (4) Chopella, (5) Nawabpeta, (6) Narsipudi, (7) Gummleru, (8) Modakuru, (9) Pedapalla, (10) Pinapalla, (11) Chintaluru, (12) Sandhipudi,

(13) Vedurumudi, (14) Angara, (15) Kapileswarapuram, (16) Tata-pudi (17) Kalavacherla, (18) Panikeru.

Staff:—The centre was allowed to continue the staff that it had before coming under the scheme and on the same terms as before. It had four workers, each of whom was being paid Rs. 25 a month, whereas under the scheme what is contemplated is only one supervisor on the scale of Rs. 50—5—75 with a fixed T. A. of Rs. 15. One of the four was a lady worker. She dropped off in 1929 for domestic reasons and it has not yet been possible to find another to take her place. On 30-6-1931 the staff of the centre consisted of three persons:—

1. A pauchayat supervisor, whose function it was to help all the pauchayats included in the Centre in the matter of accounts, correspondence, works etc ;
2. A library pracharak, whose duty was to look after the Alamuru library and the circulating library, and who read out books, newspapers etc., and explained and discussed news items at Alamuru in the mornings and in other villages in the afternoons ;
3. And a pracharak for doing propoganda regarding the evils of drink and the benefits of co-operation.

Co-operative Societies are particularly well developed in this area. They are being efficiently looked after by the Alamuru Co-operative Supervising Union and by the pauchayats of the societies themselves. The Rural Reconstruction Centre as such is therefore concerning itself with extra co-operative activities.

The achievements of the co-operative movement in this area, including also the extra-co-operative activities flowing therefrom, upto the end of 1928, have been set forth in a separate report (See "Rural Reconstruction in Alamuru," published by the Provincial Co-operative Union). Here the work of the Rural Reconstruction Centre between July 1928 and June 1931 is summarised.

Village Pauchayats:—Out of the 18 villages included in the area, three, viz. Alamuru, Choppella and Kapileswarapuram had village pauchayats in 1928; and three villages viz., Gummileru, Narsapudi and Tatapudi are still without them. In the remaining 12 villages pauchayats were organised during the last three years. But of these, the pauchayats at Modukuru and Nawabpeta are not functioning.

The receipts and disbursements of the 13 working pauchayats are given below in statements I and II:—

Receipts and Charges of the Village Panchayats in the area of the Alamuru Rural Reconstruction Centre.

STATEMENT No. I—RECEIPTS.

| VILLAGES. | Taxes. | Taluk Board Donation. | District Board Donation. | Government Donation. | Villagers' Donation. | Measuring monopoly. | Auction of tank bunds. | Auction of fish. | Auction of green grass. | Others. | Total. |
|------------------------|------------|-----------------------|--------------------------|----------------------|----------------------|---------------------|------------------------|------------------|-------------------------|-------------|---------------|
| | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. | Rs. A. P. |
| 1 Jonnada ... | ... | 923 12 0 | ... | 1,109 9 0 | 552 0 0 | ... | ... | 600 0 0 | 2,722 0 0 | 755 12 8 | 6,663 1 8 |
| 2 Pedapalla ... | ... | 7,549 10 0 | ... | 12,789 1 0 | 2,128 15 4 | ... | 671 0 0 | 685 0 0 | ... | 11,334 13 3 | 35,158 7 7 |
| 3 Kapileswarapuram ... | ... | 1,011 2 0 | ... | 3,291 10 0 | 644 6 9 | ... | ... | 165 0 0 | 672 2 0 | 13,323 10 8 | 19,107 15 5 |
| 4 Alamuru ... | 3,812 0 1 | 8,831 11 0 | 1,456 10 0 | 7,350 14 10 | 1,623 5 0 | 934 0 0 | 513 14 0 | 1,643 0 0 | 1,177 14 0 | 25,082 4 3 | 51,425 9 2 |
| 5 Kalavacherla ... | ... | 343 8 0 | ... | 742 1 0 | ... | ... | ... | 195 0 0 | 243 13 0 | 100 0 0 | 1,624 6 0 |
| 6 Chopella ... | 238 2 9 | 6,277 12 0 | 2,119 3 0 | 10,133 9 0 | 267 4 0 | 322 13 3 | ... | 91 8 0 | 2,814 8 3 | 12,518 5 3 | 34,783 1 6 |
| 7 Pinapalla ... | ... | ... | ... | 147 1 0 | 10 0 0 | ... | 252 0 0 | ... | ... | 1,417 0 0 | 1,826 1 0 |
| 8 Chintaluru ... | ... | 2,300 1 0 | ... | 3,826 9 0 | 83 2 0 | ... | 401 3 0 | ... | ... | 1,169 11 0 | 7,781 8 0 |
| 9 Sandhipudi ... | ... | 2,025 4 0 | ... | 948 1 0 | 825 0 0 | ... | 490 14 0 | 346 0 0 | ... | 3,102 12 0 | 7,737 15 0 |
| 10 Mulasthanam ... | ... | 100 0 0 | ... | 200 0 0 | 424 12 0 | ... | ... | 1,000 0 0 | 958 13 6 | 1,307 0 0 | 3,990 9 6 |
| 11 Vedurumudi ... | ... | ... | ... | ... | 30 0 0 | ... | ... | ... | 75 0 0 | 2,115 0 0 | 2,220 0 0 |
| 12 Angara ... | 1,483 9 6 | 3,402 12 0 | ... | 977 15 0 | 210 0 0 | 1,193 0 5 | 270 0 0 | 1,154 9 0 | 566 1 0 | 5,104 15 1 | 14,362 14 0 |
| 13 Panikeru ... | ... | 1,084 12 0 | ... | 2,142 8 0 | 30 0 0 | ... | ... | 520 0 0 | 832 8 0 | 242 0 0 | 4,851 12 0 |
| Total ... | 5,533 12 4 | 33,851 2 0 | 3,575 13 0 | 42,658 14 10 | 6,828 13 1 | 2,449 13 8 | 2,598 15 0 | 6,400 1 0 | 10,062 11 9 | 77,573 4 2 | 1,91,533 4 10 |

is expected to be completed during the current financial year. Both of these roads are all panchayat roads. Three bridges have been built over irrigation channels, two by the Choppella Panchayat and one by the Alamuru Panchayat.

On the improvement of water supply nearly half a lakh of rupees was spent during the last 3 years. The work done was chiefly the improvement of tanks—consisting of silt clearance, construction of steps, conservation of bunds and in some cases the digging of new tanks especially for the use of cattle. The sight of these improved tanks is very impressive and in some cases Rs. 5,000 to 6,000 has been spent on a tank. These tanks are also proving an important source of income to the panchayats, the right to fish in them and the right to cultivate their bunds, being leased out by public auction. The gain from the point of view of sanitation and decency is even greater, for the tank bunds which formerly were being used as latrines by the villagers are now converted into vegetable gardens enriching incidentally the food supply of the villages by providing a source of essential salts and vitamins.

Next to road-making and water supply, libraries received the greatest attention at the hands of the panchayats. Considering the needs of the area the money spent on scavenging and latrines, more than three-fourths was spent by the Alamuru panchayat. Pedapalla also has employed scavengers. The need for the provision of latrines and scavengers is particularly great in the delta villages. It is encouraging to see that a beginning has been made in some of the panchayats. We may expect concentration of attention on this item in the near future.

A Joint Committee of the Panchayats of the Alamuru Revenue Division has been formed under the new Local Boards Act. The District Board has lent the services of an experienced overseer with a maistry and a peon, to work under this Committee. This staff is paid from a 5 per cent deduction on the value of the works executed by the Panchayats in the area. Since this arrangement came into force, (July 1931) the Alamuru Rural Reconstruction Centre has dispensed with the Supervisor who was looking after the panchayats. The special staff under the joint Committee has been energetically pushing on new works.

It would perhaps be no exaggeration to say that nowhere else in our province have Village Panchayats and Co-operative Societies developed so well in a small and compact area as in the area included in the Alamuru Rural Reconstruction Centre.

Libraries.—The area is well served with libraries. Those at Alamuru, Kapileswarapuram and Choppella are particularly good. The Alamuru Panchayat spent on its library during the last three years as much as Rs. 2,400. A special feature of this library is that it contains a large number of standard books in English, on Economics. It is also serving as a circulating library for the area and to facilitate circulation a special hand cart has been made. Attached to the library is a reading room, which in addition to several weeklies and monthlies, gets the daily editions of the "Hindu", "Swarajya" and "Andhra Patrika." The circulating library and the reading room at Alamuru are in charge of a pracharak appointed by the Rural Reconstruction Centre. He spends the mornings at Alamuru, reading out and discussing news with some people, among other things and in the afternoon visits in turn other villages, where also news and passages from magazines and books are read out and sometimes *Puranams* are read and explained. Generally speaking all the libraries in the area are well used.

Temperance.—During the period under report the centre had a Pracharaka whose main duty was the promotion of temperance or more correctly abstinence from drink. Between April 1930 and March 1931 this Pracharak underwent imprisonment in connection with the non-co-operation movement. During the financial years 1929-30 and 1930-31 the centre received as grants for temperance propoganda Rs. 600 and 800 from the District Propaganda Committee, from which four propagandists were appointed of whom one was an Adi-Andhra and another of the toddy-drawer caste. The propagandists and the Pracharaks organised among other things, bhajana parties among the drinking classes and led them in *bhajanams*. As a result of the continued temperance propoganda, very good success was achieved at Chemudulanka and Madiki and the drink evil was generally kept in check in the whole area.

Physical Instruction.—In 1928 the centre was having the services of a Physical Instructor by name Mr. Veerabhadra Rao. In 1929 he resigned and the centre lost not only his services but also those of Mrs. Veerabhadra Rao, who was a paid lady worker in the centre. In November 1930 Mr. M. Rajanarasinga Rao, physical instructor appointed by the Provincial Co-operative Union for work in its Rural Reconstruction Centres, was sent to Alamuru. He taught drill, games, Indian exercises and scouting to the students of the Hardinge Memorial Middle School at Alamuru; and wrestling, Suryanamaskars and Indian exercises to several non-students. He

also organised a physical instruction class, bhajana party and a night school for the Adi-Andhras at Alamuru. He also opened a Hindi class in the Alamuru Co-operative Society's building which was attended by a few enthusiastic students. The Physical Instructor and the scouts helped the Adi-Andhras of Alamuru when a fire broke out in their hamlet on the 13th of March 1931 and also regulated the bathers and worshippers on Bhishma Ekadasi and Sivaratri days at the river and the temple. From July 1931 his services have been placed at the disposal of the Ramadas Co-operative Training Institute, Rajahmundry, which has opened a special training class for rural workers lasting for a period of six months. Mr. Narasinga Rao is giving to the students training in scouting, drill and games and is also teaching them Hindu.

The centre is giving special encouragement to Adi-Andhra students. It is giving 11 small monthly scholarships and has also helped three students in getting admission into the Pithapuram orphanage.

Breeding Bull:—For two years the centre maintained a breeding bull of Ongole breed obtained from the Government at Chintaladevi. The bull was very serviceable and produced some very fine calves. But in June last it suddenly died, much to the regret of the villagers.

Ryots Meetings:—The centre organises from time to time meetings of ryots to make representations to the P.W.D. officers regarding the irrigational facilities required by them. These conferences have proved to be exceedingly helpful, as in many cases the representations of the ryots so made have been attended to by the authorities.

3. ELLUR.

This centre was opened on 2-8-1928.

The Salem District Urban Bank adopted a scheme of intensive co-operative development of Rasipuram Taluk under the guidance of M. R. Ry. Diwan Bahadur R. Ramachandra Rao, C.I.E., Avl., While in the whole taluk only the existing co-operative societies were to be rectified and expanded, a varied programme of village development was attempted at Elur as an experiment. At the instance of Mr. Ramachandra Rao, Elur was recognised as one of the Rural Reconstruction Centres under the Provincial Co-operative Union.

No local committee was appointed for this centre but its functions were entrusted to Mr. Ramachandra Rao himself. The Rural Reconstruction Supervisor, like the other members of the special staff, working in Rasipuram Taluk, worked under his orders upto December 1930 when Mr. R. Ramachandra Rao fell seriously ill. Seeing that his illness was protracted, the Provincial Co-operative Union requested the Salem District Bank in June 1931 to take steps for the constitution of a local committee as in other centres. The District Bank constituted such a committee in July 1931 consisting of the President and the Vice-President of the Bank and Mr. T. Adinarayana Chettiar, ex-President of Bank. The Centre is now in their charge. Mr. P. Sivasamba Iyer was appointed supervisor in August 1928 and was given training along with the other special staff by Mr. Ramachandra Rao for about six months and has been in charge of the work at Elur all along.

ACTIVITIES.

Co-operative Society :—The society was completely overhauled in 1928-29, every loan was carefully examined, all necessary steps were taken for recovery and at the same time new members were admitted and loans were given to them. The maximum borrowing power of the society was raised from Rs. 20,000 to Rs. 40,000 and the membership rose from 112 to 240. Special encouragement was given to short term loans. The forecast system was adopted, and crop and harvest loans were issued. Overdues gradually were reduced to a negligible figure, but the recent economic depression has again sent them up. Much educative propaganda regarding the principles of co-operation has been done and the members are now far better informed than before. Thrift is encouraged by means of

hundi boxes. Mr. Strathie, the Registrar of Co-operative Societies visited the village on 26-3-1930 and is reported to have been satisfied with the improvement effected in the working of the society.

Village Panchayat :—When Rural Reconstruction was started in the village it already possessed a Panchayat. The Rural Reconstruction Supervisor has been elected as a Panchayatdar. The Panchayat has started three schools which are working satisfactorily. Pucca buildings have been provided for two of them by the villagers for which the usual half grant was given by the Registrar General of Panchayats. The Panchayat also deepened two wells and dug a new one, besides repairing a fresh water pond constructing a wall round it. For these also the Panchayat obtained half grants from the Registrar General. The total works are estimated to be Rs. 5,500. The Panchayat has passed a resolution calling upon each adult resident to contribute a day's labour in the year for communal work.

Sanitation & Medical Relief :—The resources of the Panchayat appear to have been fully taxed by the provision of school buildings and wells. It was not in a position to arrange for the sanitary improvement of the village. Mr. Ramachandra Rao therefore thought it advisable to spend for it from the funds at his disposal. A night soil cart, a rubbish cart and six dust bins were purchased and a sweeper and a scavenger were employed. In the beginning the salaries of both of them were paid by Mr. Ramachandra Rao, but later the Panchayat agreed to bear half the expenditure on this account. Grants were obtained for the Panchayat from the Taluk Board for sanitation and lighting. A latrine for the use of females was also built on a plot of land purchased by Mr. Ramachandra Rao for this and for agricultural purposes. In the beginning it was not much used but now it has become fairly popular. A lot of prickly pear also was removed, with the double object of keeping the village site clean and conducting manurial experiments.

By writing to the authorities Mr. Ramachandra Rao obtained sanction for the opening of an allopathic rural dispensary at Elur. But as no qualified medical man came forward to work there on the usual terms, he offered a subsidy of Rs. 10 per month from the rural reconstruction fund and obtained the services of a qualified person. A sum of Rs. 300 was also spent on medicines, instruments and books which are not usually supplied to rural dispensaries. The dispensary is well used by the villagers and the physician in charge, Mr. V. Narayanan, takes a keen interest in the work of the centre. In 1930 when there was an outbreak of cholera, he and Rasipuram

Health staff took prompt steps, both curative and preventive, and prevented the diseases from assuming an epidemic form. He was deputed to undergo special training in leprosy treatment and in treating patients, the medicines charges being met by the District Board.

Health propaganda was carried on in the village with the help of the Health staff and the magic lantern.

Agriculture :—With a view to conduct agricultural demonstrations and experiments, a plot of land measuring about $1\frac{1}{4}$ acres was purchased, Mr. Munro, Deputy Director of Agriculture, visited the village and prescribed a varied programme. Under the direction of the departmental staff, demonstrations in ploughing, sowing, manuring etc., were held. But owing to unfavourable seasons they were not successful, that is to say, the ploughs and the methods recommended by the Agricultural Department have not been taken up by the villagers. Prickly pear compost with bonemeal was made on a small scale as an experiment in 1929. It was readily taken up by the villagers. Thereupon it was made on a pretty large scale in 1930, out of the prickly pear that had grown on the village site and was causing it to be insanitary. But owing to the abnormal fall in the price of agricultural produce, people are either unwilling or unable to buy it. Karunganni cotton was successfully sown in the plot owned by the centre and its cultivation has spread in the village to some extent. Bellary big onions also were successfully grown in the demonstration plot and have attracted the attention of the villagers.

Mr. Ramachandra Rao was able to induce the Government to bore a well in the village free of all cost, with a view to demonstrate the possibility of increasing water supply for irrigation purposes by means of tube wells. A well was selected and boring was undertaken by the Industries Department. The bore has gone to a depth of about 320 feet. No specially good spring has been struck yet. The Industries Department is considering whether the boring should be continued or given up.

Khaddar :—As in other centres the encouragement of hand spinning was taken up at Elur also. When the centre was opened a private dealer was giving work for just a few charkas and was giving less than the usual wage. When we entered the field we began giving the usual wage and he followed suit. The number of charkas increased from 20 to 46 in the second year and the private dealer gave up the business. In the next year there was further expansion, the number of charkas rising to 93. The centre supplied

cotton to the spinners and took back the yarn from them after giving the usual wage for spinning. This yarn was given to selected weavers for agreed wages, and the cloth was taken over and sold by the Supervisor. Recently the value of khaddar manufactured in the centre amounted to Rs. 500 a month. The centre incurred a loss of Rs. 382-12-9 in 1930-31 owing to the price of khaddar being reduced. As the object of the centre is to encourage a cottage industry without incurring more responsibility than is absolutely necessary, arrangements have now been made with the All India Spinners' Association to take over the financial responsibility. The Supervisor will continue to give his services in the matter of issuing cotton, collecting yarn and supervising the weaving.

Temperance :—Propaganda and other steps for rescuing people from the clutches of the drink evil have been a very important item of work in this centre. Lectures, pictures, talks, abstinence vows, communal discipline, memorials to Government and all other legitimate methods were employed, with the result that Elur and the surrounding area have been included by the Government in the experimental dry area, and all toddy and arrack shops in the neighbourhood have been closed. It is estimated that the annual saving to the people of the area by this means alone is nearly two lakhs of rupees. There are still individuals who drink and even get drunk when they go outside the dry area for festivals or business. But such cases are reported to the caste organisations and action is taken by them. A careful watch is also kept against illicit manufacture of liquor and any cases that occur are promptly reported to the authorities.

Adult Education :—A night school is conducted by the supervisor, where in addition to ordinary instruction, stories and passages from books are read out, current news and instruction in religion, sanitation and civics are given and a few are taught English. It has been recognised by the District Educational Council and receives a grant. The attendance, however, has been somewhat fluctuating.

Weekly Bhajana which had been in existence has been stimulated and strengthened. It is now performed more regularly and better attended.

Physical Culture :—A physical instructor, trained in the Hindusthan Seva Dal, was appointed in March 1930, but his work was hampered on account of police suspicion, which kept the villagers away from him. After a year he left the village. In his place a young man with inferior qualifications has been appointed, but he is more popular than his predecessor. Volley ball has been introduced and a few young men are learning yogic asanams.

Miscellaneous :—By the efforts of the Supervisor a Post Office has been established in the village. An attempt was made to organise a Land Mortgage Bank in the village. After visiting it the Deputy Registrar has organised one at Rasipuram for the whole taluk. A gramophone and some twenty records kept at the centre provide occasional recreation to the villagers.

3, GUDLAVALLERU.

The centre was opened on 8-1-1929.

The Local Committee formed consisted of Messrs. Rao Sahib G. Venkataratnam Pantulu Garu, Dr. B. Pattabhisitaramayya Garu and Mr. E. Venkateseshayya Garu.

When the political atmosphere in the district became disturbed in April 1930 the latter two members were imprisoned. Their places remained vacant until January 1931, when M. R. Ry. Rao Bahadur Sedambi Hanumanta Rao Pantulu Garu and Mr. K. Venkatasubbayya Choudari Garu were appointed to the committee.

Mr. Raghava Sarma was appointed supervisor in September 1928 and sent to Madras for training in the Co-operative Training Class conducted by the Madras Provincial Co-operative Union. After undergoing training he joined duty as supervisor when the centre was regularly opened on 8-1-1929. In April 1930, however, he too was imprisoned. Section 144 was put in force in the district and no meetings could be held, nor other work of the centre attended to. It was not therefore considered advisable to appoint another supervisor while the Section was in force. In March 1931, by which time Mr. Raghava Sarma had come out of prison and the political atmosphere had changed towards normal, the local committee reappointed him as supervisor, after obtaining an undertaking from him that he would not allow himself to be drawn away from the work of the centre for at least two years. He has since been in charge of the centre. Thus for nearly a year the centre was without a supervisor.

Twenty villages were included in the area of the centre. It being a delta tract, the villages are very close to each other and all within a radius of six miles from Gudlavalleru. The villages included are :— (1) Kavutavaram, (2) Gudlavelleru, (3) Angalur, (4) Chandrala, (5) Vinnakota, (6) Kurada, (7) Seri Duggamalli, (8) Cheunur, (9) Kamalapuram, (10) Vemavaram, (11) Chirichiutala, (12) Seri Kalavapudi, (13) Nuzella, (14) Penjendra, (15) Inampudi, (16) Pasumarru, (17) Perisepalli, (18) Mantidikola, (19) Chitram, (20) Pesarimilli.

To start with, the supervisor was directed to make a survey of existing amenities in the area such as schools, libraries, panchayats, co-operative societies etc. This naturally occupied the first few

months. Then with a view to try the experiment of redeeming a whole village completely from indebtedness to money lenders with the help of the land mortgage bank, the village of Kavutavaram was selected and the supervisor was asked to collect detailed information from every ryot in the village regarding his holdings, indebtedness, income, expenditure etc. When this was completed negotiations were started with the Gudlavalleru Land Mortgage Bank and Madras Central Urban Bank for giving effect to the idea. It however did not materialise owing to several circumstances. About this time the Madras Legislative Council appointed the Resettlement Enquiry Committee with M.R.Ry. Diwan Bahadur R. N. Arogyaswamy Mudaliar Avl. as Chairman. The supervisor was deputed by the local committee to explain to the ryots the questionnaire issued by the Enquiry Committee and to help in preparing answers to it. The supervisor also accompanied the Committee when they visited some villages in and near the Rural Reconstruction Centre and assisted them in all ways.

Education.—The centre has devoted special attention to the promotion of popular education, considering it as the best means of achieving rural uplift. The supervisor was therefore asked to organise libraries and reading rooms in all the villages where they did not exist and to stimulate interest in the existing ones. A circulating library was started by the centre at its own expense at Gudlavalleru from which books are taken out to various villages and regularly issued and collected. This library has been permitted to take books for circulation from the Angalur library, which is perhaps the finest rural library in all the Andhra districts. The Gudlavalleru Co-operative Society was induced to set apart Rs. 200 from its common good fund for starting a library for local use. Books from the circulating library are issued to female readers in their homes in the villages of Gudlavalleru and Pesaramilli. Other libraries were started by the efforts of the supervisor at Chennur, Kurada, Pasumarru, Perisepalli and Daggumalli. In other villages the efforts of the supervisor have not yet fructified. Wherever funds permit the libraries also get newspapers and magazines.

When the supervisor goes round the villages he reads out news from papers, gives readings from puranams and also performs Hari-kathas, for all of which he is very well equipped. Frequent meetings are arranged, sometimes with the help of the magic lantern, and ardent propaganda made on various subjects intimately concerned with rural welfare, such as co-operation, thrift, sanitation, evils of

drink, village panchayat, etc. There are bhajana mandirams in all the villages. The supervisor joins in the bhajanas and encourages them to be regular and earnest. As the area is well served with schools new schools are not needed. But the supervisor visits them, keeps himself in touch with the teachers and persuades parents to send their children regularly to school.

Co-operative Societies.—In 13 villages included in the centre there are co-operative societies, which until the economic depression of 1930 set in, were working without overdues to the Central Bank. Now that it is not so, the Rural Reconstruction supervisor is assisting the co-operative staff in the matter of collections. The Adi-Andhra credit societies for Chennur and Kavutavaram and a Trading Union at Kamalapuram were organised but they were refused registration. A society organised at Perisepalli, however, has been registered. The meetings of the societies in the area are attended by the supervisor and the principles of co-operation and the various kinds of benefits which the members may derive from the societies are explained. They were induced to support libraries out of their common good fund.

Panchayats.—On account of the agitation started by the centre regarding the formation of village panchayats, two of them, at Gudlavalleru and Pasumarru respectively, which were supposed to exist, but the existence of which was not known to the villagers, began to work, and a new one came into existence at Chennur. The Chennur Panchayat, besides maintaining the library and the rural dispensary, has repaired a tank and laid a road at a cost respectively of Rs. 1,800 and Rs. 900. The Gudlavalleru Panchayat has provided bore-hole latrines, improved the cremation ground, laid a road to Adi-Andhra quarters etc.

Cottage Industries.—In this area khaddar is very much in vogue and in every village there are a number of charkas. But certain facilities were needed for spreading spinning as a cottage industry. The centre therefore obtained slivers and made them available for sale in the different villages. It also collected yarn and made it available for looms. As a result of this, khaddar production, which formerly was confined to Angalur and Kavutavaram, was extended to Cherichintala, Gudlavalleru, Penjendra, Perisepalli and Pasamarru. The centre also obtained some khaddar from outside and sold it.

As the supervisor has a good knowledge of dyeing, he helped with advice and instructions two Muhammadan families of dyers in the area.

The exceptional political conditions of last year interfered very much with the work of this centre. But a good deal of propaganda was done resulting in the awakening of people's interest in constructive programmes.

4. INDUKURPET CENTRE.

The Centre was formally opened on 27th January 1929 by Mr. V. Ramadas Pantulu.

The headquarters of the centre were fixed at Indukurpet in consultation with local co-operators and the village of Leboor was examined. The latter was deemed unsuitable, as it is not on the bus route, is not the headquarters of the Union and has no Post Office.

The local committee was constituted with the following gentlemen :—

1. Mr. M. Venkatarangayya, M.A., Principal, V. R. College, Nellore, and President, District Co-operative Federation,
2. Mr. K. V. Raghavachariar, B.A. B.L., President, District Bank,
3. Mr. D. Swamidoss, B.A., Secretary, Y. M. C. A., Indukurpet,
4. Mr. Srihari Naidu, President, Supervising Union, Indukurpet, and
5. Mr. P. Pattabhirama Reddi, Potlapudi.

Mr. Venkatarangayya was convener of the Committee until he resigned on 12th August 1930. Thereafter Mr. K. V. Raghavachariar has been convener. As difficulty was experienced in getting a quorum for the meetings of the committee, its strength was reduced to three, consisting of Messrs. M. Venkatarangayya, K. V. Raghavachariar and D. Swamidoss. In June 1931 Mr. M. Venkatarangayya left Nellore for Vizagapatam to take up an appointment under the Andhra University. In his place Mr. V. Raghavayya, B.A. B.L. has been appointed.

It was resolved to include the following villages in the operations of the Centre :—

(1) Indukurpet, (2) Lebur, (3) Jagadivipet, (4) Narsapuram, (5) Mypaud, (6) Koratur, (7) Venkanapalem, (8) Kothapalem, (9) Potiapudi and (10) South Amalur. It was resolved also that more intensive work be attempted at Indukurpet, Leboor, Mypaud, Potlapudi and Koratur.

After a time it was resolved, in view of the fact that the District Board of Nellore started a Rural Reconstruction Centre of its own

in the adjacent area, with Potlapudi as its centre, that Potlapudi, Kothapalem and Amalur be given up and in their place Somarajupalli, Gangapatnam and Komarica be included.

Mr. G. Venkatasubbaiya was appointed as supervisor in September 1928 and sent up to Madras for undergoing training in P. C. U. Co-operative Training Class for Inspectors and Supervisors. He underwent training from 1st September to the middle of December 1928. Thereafter, till the end of January 1929, he helped the directors of the Triplicane Urban Co-operative Society in conducting an experiment in milling paddy, and did propaganda for the formation of a Land Mortgage Bank in Nellore Taluk. The application for its registration was subsequently sent up, but the Registrar of Co-operative Societies decided not to register it. His regular work as Supervisor began on 1-2-1929, since when he has been continuously in service.

Collection of Statistics.—As the first step in the work of the Centre, the Committee asked the Supervisor to visit every village in the area and collect statistical information, get acquainted with the people and also popularise among them the objects of the centre. He collected statistics relating to cottage industries, education, medical aid, rest houses, land, crops, sources of irrigation and water supply, co-operative societies, temples, toddy shops, machinery, money-lending and litigation. The first few months were mainly devoted to this preliminary work.

The main activities of the centre are summarised below :—

Co-operative Societies.—From the beginning the Supervisor was advised to keep himself in touch with the societies, to educate the members regarding the true principles of co-operation and help the local Supervising Union in every way. Owing to the present accumulation of overdues in the societies, their improvement has become a specially uphill task, but the supervisor is steadily attempting the rectification and consolidation of societies. During each collection season, i.e., during May and June, after the starting of the centre, the Supervisor has helped the Indukurpet Supervising Union in collecting dues in several of the societies and every village in the area has got a society. In the latter part of 1930, the Supervisor was permitted by the Local Committee to accept the Secretaryship of the Myapud Co-operative Society with a view to work it up and considerable improvement has resulted thereby.

A Thrift organisation for the fishermen of Myapud was started in the latter part of 1930 with 15 members who agreed to lay by

4 annas a week. They made regular payments for some months, but when the rainy season set in they fell off, as no fishing was possible then. Even after the rainy season was over the payments were not resumed for some months owing to the fishing season being poor, for which reason some of the fishermen temporarily migrated to other hamlets. Payments are now being resumed, but their continuance will depend on the catches of fish.

In the last week of May 1930 the supervisor helped the Secretaries of the Provincial Co-operative Union who camped at Indukurpet in the preparation of magic lantern slides for co-operative propaganda.

At the request of the Triplicane Urban Co-operative Society (Triplicane Stores) he collected information regarding the quantity of *Molakolakalu* paddy which would be available in each village of the rural reconstruction area for purchase by that society.

Owing to the sudden abnormal fall in the price of paddy after June 1930 all the societies and their members are in difficulties, and therefore no tangible improvement in the working of societies could be claimed to have resulted from the educative propaganda and other co-operative work of the supervisor, except perhaps in Mypaud society.

Panchayats.—When the centre was opened, there was only one Village Panchayat in the area, namely, that at Indukurpet. By the efforts of the supervisor and Mr. M. Venkatarangayya, convener of the Local Committee and Honorary Organiser of Panchayats, new Panchayats were formed at Mypaud, Potlapudi, Narsapuram, Somarajupalli, Koratur and Gangapatnam. The supervisor has been helping these Panchayats in every way. Proposals for works and taxes were sent up by Mypaud and Indukurpet Panchayats and were sanctioned by the Registrar General, but owing to the disturbed political atmosphere the taxes were not imposed. The Mypaud Panchayat filled up insanitary ditches in and near the village, for which it obtained a half grant of Rs. 480 from the Registrar General. The other half of the expenditure was borne by the Panchayat, mostly in the shape of labour contribution and partly out of its funds. It obtained a lease of the right to fish in the tank and by re-auctioning it got a good margin. A large quantity of prickly pear was removed in Mypaud and Somarajupalli, the work being estimated at Rs. 800 and Rs. 400 respectively. In the latter village the work was carried out by the

Panchayat for the owners of the land on which prickly pear had grown, with some profit for the Panchayat. At Koratur, owing to the existence of faction, propaganda against the Panchayat was started by interested parties, and caused the postponement of elections. But it died out after sometime and elections were successfully held. The recent political excitement and economic distress have made it impossible to proceed with workers or impose taxes and a return of normal times has to be awaited for the efficient working of the Panchayats in the area. But whatever is possible is being attempted, especially at Mypaud.

Khaddar.—As a means of encouraging cottage industries the production of khaddar, for which there was local enthusiasm, was taken up in October 1929. At that time 50 spinning wheels were at work in the area. The number was gradually raised to 145 in about a year. For the convenience of the spinners the centre undertook the supply of cotton to them almost at cost price and purchased yarn from them at current rates. This was given to the weavers who agreed to work under the instructions of the supervisor. The weaving wage was fixed at so much per piece and the cloth was sold either locally in the villages or at Nellore. The number of weavers working for the centre has risen from 4 to 9. The average monthly earning of a regular spinner is Rs. 2-12-0 while that of a weaver is about Rs. 15. A portion of the yarn is kept by the spinners for their own use, while some is also sold to outsiders; so that it is only the remainder that is given to the supervisor. A sum of Rs. 200 was made available by the centre as capital and a special committee consisting of the supervisor and two public spirited ryots of Mypaud was formed to be in charge of the whole business. A further capital of Rs. 350 was made available by the ryots of the area. Naturally spinning is most resorted to when agricultural operations are slackest. A separate account is maintained of the khaddar activity and the centre has incurred no loss upon it.

Agriculture.—Under instructions from the Agricultural Demonstrator, Nellore, a large number of plots were selected at Mypaud and Indukurpet for the demonstration of the use of chemical manures for paddy fields in 1929. The result was encouraging in the majority of cases. But owing to the low price of paddy the ryots are not now disposed to use costly chemical manures. The demonstration van of the Agricultural Department was also taken round to all the road-side villages in the area. The demonstration of castration of animals by the latest improved method was arranged for

by the supervisor and proved very successful. In the 1930 season 130 bulls belonging to 4 ryots in 3 villages were castrated by this method. But in the 1931 season 30 ryots belonging to 8 villages got 71 bulls, 31 buffaloes and 21 rams castrated by the same method. All this was arranged for by the supervisor.

Education.—(a) *Children.* The supervisor has made a list of children of school-going age in six of the villages included in the area and has been speaking to their parents to send them to school.

For the benefit of the children of Mypaud fishermen a day school has been opened by the local committee which is well attended by boys and by a few girls. The supervisor has also been able to persuade some Yenadi parents—a specially backward class in the district—to send their children to school.

(b) *Adults.*—A circulating library is maintained by the centre from which books are taken out at regular intervals to each village, lent out to villagers and collected. Some of the books were collected but a larger number were purchased by the local committee. Some magazines also are circulated.

In 1927 the local committee arranged for the reading of Puranam at Indukurpet for a period of three months. Thereafter the villagers have themselves made arrangements for its continuance. In 1930 they collected funds and celebrated the *Pattabhishekam* of Sri Rama in a befitting manner.

Temperance.—Temperance propaganda has been steadily carried on in the whole area during the last two years by means of leaflets and meetings. There has been a notable decrease of drink at Mypaud, Gangapatnam and Koratur. Special attention was paid to the fishermen and depressed classes of Mypaud who have now almost given up drink. Along with temperance thrift also is preached, so that the money wasted on drink may be saved for the people.

Public Health.—Propaganda meetings were arranged in all the villages with the help of the District Health staff. A drinking water well was constructed for the fishermen of Venkanapalem with the help of the Nellore Cyclone Relief Committee. An Ayurvedic rural dispensary was obtained for Mypaud, and to secure its continuance the supervisor collected a sum of Rs. 250 from the people of the village as a contribution to the Taluk Board.

After the November-December rains of 1930 cholera broke out in several villages in the area. It was most severe in Indukurpet,

and Somarajupalli. The supervisor invoked the help of the District Health authorities, heartily co-operated with them, administered medicines to the afflicted persons at Somarajupalli and other villages and popularised the use of a preventive medicine recommended by the Health authorities. Several enlightened young men of the area co-operated with him as volunteers. By their combined efforts the epidemic was soon brought under control. The local committee gladly spent whatever money was needed on this item of relief.

Miscellaneous.—The supervisor underwent training in scouting arranged by the Provincial Scout organisation at Indukurpet for a week. But he has not however been able to organise any troops yet in the area. He has introduced foot-ball at Mypaud which has become popular. The gramophone supplied to him affords occasional recreation, especially to the humbler classes in all the villages.

For the benefit of the fishermen of Mypaud an application has been made to the Fisheries Department to open a fish curing yard at Mypaud. The matter however is still under correspondence.

5. LEPAKSHI.

The centre was formally opened on 31st May 1929 by M.R.Ry. Rai Bahadur N. Gopaldaswamy Iyengar Avl., then Collector of Anantapur.

A local committee consisting of the following gentlemen was constituted.

1. Mr. K. S. Raghavachar, B.A., L.L.B., Anantapur.
2. „ G. Rameswara Rao, B.A. B.L., „
3. „ L. G. Sastry, Hindupur.
4. „ A. Narayana Rao, B.A., Penugonda.
5. „ L. Venkatanaranappa, Lepakshi

Mr. Venkatanaranappa was chosen as the Convener of the Committee. In November 1930 Mr. M. Narayana Rao of Anantapur was added.

At the time the centre was opened no supervisor had been appointed and applications were invited for the post from workers in the District. Among them was one from Mr. V. Ramachandra Rao, B.A., B.L., who was enjoying a fair amount of practice at the Anantapur Bar, but who was prepared to take up the work at much self-sacrifice out of love for the cause. He was appointed and he took charge on 22nd August 1929. The centre is specially fortunate in getting a worker of his attainments and missionary zeal.

When he joined duty what may be described as famine conditions were prevalent in the area. He visited every village, collected information regarding the number of cattle, the fodder available, the state of unemployment etc., interviewed the District Collector and other officials and arranged for relief operations. But fortunately subsequent rains eased the situation and the supervisor continued his preliminary investigations for sometime more.

The following villages, with their hamlets, which vary from three to five are included in the area :—

(1) Lepakshi, (2) Cholasamudram, (3) Kallur, (4) Manepalli, (5) Sirivaram, (6) Kodipalli, (7) Kondur and (8) Kauchisamudram.

ACTIVITIES.

Co-operation.—When the centre was started all the villages in the area except Kondur had co-operative societies, which like most

societies in the district were in an unsatisfactory condition. The supervisor has co-operated with the District Federation and the local supervising union of Lepakshi in the attempts to set them right. In every village he has carried on incessant education and propaganda, sometimes with the help of the magic lantern, explaining the principles of co-operation, the law relating to co-operative societies and the implications and spirit of bye-laws. He had been arranging for frequent general body meetings and attending them, helping them in the matter of collecting dues, executing decrees, getting properly secured the loans that were insufficiently secured and generally rectifying the societies. He organised a training class for panchayat-dars at Lepakshi in May 1930. He organised a new Society at Kondur, which was without one, and has been giving detailed attention to its working, so as to make it a model society for the area. He also organised a grain bank at Manepalli. This and another at Kallur which was in existence before his advent in the area, are working satisfactorily, though both of them are unregistered. Owing to a series of bad years, and the present economic depression and the neglect of former years, overdues have accumulated heavily, and it has not been possible to reduce them substantially. But collections during the last two years are better than in the previous ones and the general body members have been awakened to their responsibilities. They now evince an interest in their societies which they never did before.

As part of co-operative propaganda the supervisor is carrying on an economy campaign and teaching the villagers to frame rough family budgets. This year (1931) he was able to induce five marriage parties at Manepalli to club together and keep down expenses. Similarly at Kallur he induced a respectable family to combine a marriage and a thread ceremony and celebrate them economically.

He has also been inducing would be litigants to settle their disputes by arbitration and avoid going to courts. Several land and money disputes and some petty criminal cases were thus settled by him by arbitration. In one case the property involved was worth Rs 25,000. The area is thus benefiting by his previous experience as lawyer.

Village Panchayats.—When the centre was opened village panchayats were in existence at Lepakshi, Cholasamudram, Manepalli and Srivaram. The latter two were moribund. The supervisor has been able to revive the Manepalli panchayat. Srivaram has not yet responded to his efforts owing to factions in the village. New

panchayats have been organised in Kallur, Kodipalli and Kondur. House tax has been levied at Lepakshi and Manepalli.

Sweepers for cleaning streets are employed by the Panchayats of Lepakshi, Cholasamudram, Kallur and Manepalli. Rubbish heaps were got removed in Manepalli and Kallur by the panchayats taking action under the Act. For the clearance of prickly pear the cocheneil insect has been introduced in all the villages, while at Kallur and Manepalli the panchayats compelled the house-owners to remove the pear in residential quarters. At Kallur an insanitary ditch was closed by communal labour and some rubbish-receptacles were built with mud walls. Minor sanitary improvements have been made in several of the villages. The sanitary condition of the villages and their approaches has been improved by appeals to the people, a novel method adopted being the singing of specially composed humorous songs in bhajana processions.

There are two Ayurvedic dispensaries in the area, one at Lepakshi and the other at Cholasamudram. The pay of the physician in the former is met by the Taluk Board while the cost of medicine is borne by the panchayat. The dispensary at Cholasamudram is a private one aided by the panchayat. Both are very popular. Besides, itinary visits by outside physicians are sometimes arranged and quinine is distributed by the supervisor.

The Panchayats of Lepakshi, Manepalli and Kallur have been given the control of irrigation in their respective areas. Rules regarding it have been framed and submitted to the authorities. Village site porombokes have been entrusted to the panchayats at Lepakshi, Cholasamudram, Kallur, Manepalli and Kodipalli, while the panchayat of Kondur refused the transfer. Sign boards, following the example of Mysore villages, have been put up in Lepakshi, Cholasamudram and Manepalli. Entrances to villages have been repaired and paved with stone in some villages. Libraries are maintained by the panchayats of Lepakshi, Manepalli, Cholasamudram, Kodipalli and Kallur.

Education.—(a) *Children.* In all the parent villages there are Board elementary schools and in some more schools than one. The supervisor spoke to the parents, with the result that the strength of the schools generally increased during the first year of his work. Thereafter it has been stationary. The chief reason for its not increasing further is that the poorer classes send their children to look after the cattle belonging to themselves or to others. In the latter case the children are given food and clothing by the

employers. Two Board schools which were about to be abolished were resuscitated by the supervisor inducing the parents to send their children to school. Three aided schools were started in the hamlets, two of which had to be closed after six months, though intended for backward classes, because they did not receive recognition. The other school is continuing. The supervisor attends the monthly meetings of the teachers and interests them in general welfare work and in better methods of teaching. Except in two villages, gardens have been attached to all boys' schools, and out of the money realised by the sale of produce, prizes are given to boys for good conduct, sports etc. The group system is introduced in all the schools, whereby the children in each class are divided into groups of five or six with a leader elected by themselves. The groups become responsible for regular attendance and the cleanliness of their members and for social service. Regular training in social service is given to the older boys at Lepakshi. Physical exercises and games are given special attention in all the schools. Students have worked with their teachers and others in removing prickly pear, rubbish heaps etc. and in levelling streets. At Manepalli spinning is taught to the children, while at Lepakshi a weaving teacher is appointed. In one village the Muhammadan parents repaired the walls and floor of a school building intended for their children. Village panchayats are taking steps to open schools in some of the hamlets belonging to them.

Two summer schools, each lasting for a fortnight for training teachers in rural uplift, were held at Lepakshi and Madakasira in 1930 and 1931 respectively. They were given grants by the Taluk Board and conducted by the Supervisor. A large number of well known public workers in the district and from outside were invited to deliver lectures to the students and they generally responded. This has awakened a new spirit of helpfulness and co-operation among the teachers, who find in the supervisor an inspiring example.

(b) *Adults.*—Several methods are being followed for the education of adults, Night schools were started in all the main villages and in some hamlets. But three of them had to be closed after a few months as they did not obtain recognition. The others are working satisfactorily, though in the busy agricultural season the attendance naturally gets low. The reading of Puranams was started in Cholasamudram, Manepalli and Srivaram, and is enthusiastically kept up with a good attendance. Mr. P. Ramachari of Anantapur gave model readings in Purnam reading in several of the villages.

Bhajana parties have been organised both for school children and adults in all the villages. The school children are taught to sing not only devotional but historical and health songs. Occasional plays by school children and Harikathas were arranged in which subjects of topical interest were introduced. A large number of lectures, often with the aid of the gramophone and the magic lantern, were delivered in each village on different subjects but chiefly on village uplift and temperance. Meetings were also specially arranged at which distinguished men from outside spoke to the villagers on various subjects. Some teachers have formed themselves into a band of volunteers. They meet weekly in different villages, perform Bhajana, do some physical work for the benefit of the village such as filling up ditches, removing prickly pear and hold a meeting in the evening at which speeches on topics of interest are made. Our supervisor of course joins and guides them whenever possible.

In the summer of 1930 the students who had come home to Manepalli from Penugonda were organised into a temporary social service volunteer corps under the leadership of our supervisor. They did street cleaning and carried on effective propaganda against drink in a hamlet of the village; while in another hamlet they dug a well and permanently relieved it of water scarcity.

In addition to the five Panchayat libraries already mentioned, a private one has been formed at Srivaram by collecting books from the people. The supervisor encourages the use of all these libraries by the people. Some of them also get weekly and monthly Journals.

Temperance.—The promotion of temperance and abstinence from drink has always been a prominent item in the programme of this as of other centres. The District Temperance Propaganda Committee made grants of Rs. 100 and Rs. 200 respectively during the last two years. Four Pracharakas, two of whom were Adi-Andhras, were appointed and the various activities were conducted under the direction of the supervisor. Young men in all villages have been saved from getting into the evil habit of drink. Many families have entirely given up drink, while in others, especially the middle aged and the old, have considerably reduced their consumption.

Agriculture.—Propaganda regarding agricultural improvements was made by the Supervisor with the help of the Agricultural Demonstrator of Hindupur in all the villages, and demonstration plots were worked at Kallur and Manepalli. The use of iron ploughs,

iron guntakas, improved paddy seed, chemical manures and Sindhwahi furnace were demonstrated. Iron ploughs are not freely taken up, even though their advantage is admitted. Single seed transplantation is becoming popular in paddy cultivation. Though the Sindhwahi furnace is found advantageous, pans suitable for it are not available in the area. Wrapping the sugarcane, which costs nearly Rs. 30 per acre in labour charges, was given up in a village as an experimental measure and no difference was observed in the yield. Cotton seed was distributed to a few ryots and grown as a mixed crop with chillies for domestic use. Plantain, tobacco and fruit growing are being advised in favourable places and some ryots are attempting it.

An old irrigation canal which led the water of the Pennar to the Manepalli Srivaram tank was traced by the Supervisor and the leading ryots of the villages, and an agitation has been started for its restoration. A memorial has been submitted to Government and a deputation led by the supervisor waited upon His Excellency the Governor during his recent visit to Anantapur. A conference of the ryots of the Hindupur Taluk was organised by the supervisor in March this year. It was presided over by the District Collector. The grievances and needs of the ryots were all mentioned in an address prepared by the Supervisor. He also convened a conference of the village officers and exhorted them to co-operate in rural welfare work.

Cottage Industries.—Kumbly-weaving at Lepakshi and basket-making in a hamlet of Manepalli are being financed and encouraged by the local co-operative societies. Khaddar production was begun in the latter part of 1930. The rural reconstruction fund has advanced about Rs. 150, which has been supplemented by local capital to some extent. About thirty wheels have been supplied to spinners who are also supplied with slivers from Hindupur. As the yarn produced in the centre is not sufficient, a quantity of hand-spun yarn is also got from outside. A separate account is maintained for khaddar. Propaganda has been made in favour of poultry-keeping and some ryots are eager to take it up. But, they have been advised to wait for some time as the present year has been very disastrous to poultry, owing to epidemics.

Attention is bestowed on the management of temples in the area. For repairing the temple at Cholasamudram, the supervisor has collected about Rs. 80 from the residents of the village and its hamlets. Sankara Jayanthi and Rama Jayanthi were celebrated at Manepalli, and useful discourses were arranged on those occasions. The centre is receiving many distinguished visitors whose visits are utilised for meetings and propaganda.

Altogether a new spirit of earnestness and activity is pervading the area, entirely due to the work of the supervisor.

6. MAHARAJAPURAM.

The centre was formally opened on 6-8-1930, but work had actually begun on 1-7-1930.

The local committee consists of the following gentlemen.

1. M.R.Ry. P. S. Kumaraswamy Raja Avl., Rajapalayam,
2. „ A. Srinivasachariar Avl., Srivilliputtur,
3. „ S. Ramaswamy Naidu Avl. Sengamalanachiapuram.
4. „ R. Venkatarama Naidu Avl. Alamarathupatty,
5. „ R. G. Nallakuttalam Pillai Avl. Srivilliputtur.
6. „ R. Krishnaswamy Naidu Avl. Maharajapuram.
7. „ G. Alagiriswamy Naidu Avl. Maharajapuram.

Mr. A. Srinivasachariar is convener of the committee, but the supervisor is placed under the control and supervision of Mr. Alagiriswamy Naidu who has been requested by the local committee to be Honorary Worker of the centre. Maharajapuram, his village, is made the headquarters of the supervisor.

The supervisor is Mr. M. C. Guruswamy Pillai who was a co-operative supervisor before being taken over here. He was appointed in May and sent for training to Y. M. C. A. summer school at Ramanathapuram and to the Rural Reconstruction centre at Elur, in the months of May and June. He began regular work at the centre on 1-7-1930.

The villages included in the area are (1) Maharajapuram (2) Sundarapandium and (3) Pudupatty. Each of these has several hamlets attached to it.

Co-operative Societies.—All the three villages had co-operative societies before the centre was opened. They are affiliated to the Sundarapandiam Supervising Union. The Pudupatty Co-operative society was in a dormant state with heavy overdues. The society was set right by right by Mr. Alagiriswamy Naidu and the supervisor by frequent visits and propaganda. A new panchayat has been formed which is enthusiastic about work. At Maharajapuram general body meetings are held on every full moon day, when co-operative principles are explained or some useful or interesting information given by the supervisor. Special efforts were made to promote collections and reduce overdues. Arrears of both interest and principal could be collected, however, only in the Maharajapuram society. In the two other societies only interest due, but including

all arrears, was collected. But for the present abnormal economic depression the collections would have been far more satisfactory. Steps have been taken to bifurcate the Sundarapandiam Society which has a membership of 200 spread over the village and its eight hamlets. In the villages and the hamlets much co-operative propaganda has been conducted with the help of the magic lantern and otherwise. The supervisor has been asked by the local committee to look after the office work of the Sundarapandiam Supervising Union.

A drama on co-operation was enacted by the night school students of Maharajapuram with all the necessary equipment on 24-2-'31. The supervisor trained the students for this for three months. It was attended by an audience of nearly 2,000 persons and appreciated by all.

Village Panchayats.—Panchayats are in existence in all the villages included in the reconstruction area. The Honorary Worker and supervisor are helping them in every way. The Maharajapuram Panchayat levelled a street, built side drains leading from a well and built a school house for the Adi-Dravidas. This was built in the compound of a committee school and required for completion much tactful persuasion on the part of Mr. Aligiriswamy Naidu. The Panchayat sent up a proposal for the introduction of compulsory education in the village. It was supported by the Taluk Board and the Registrar General of Panchayats and referred to Government for sanction. The Panchayat was informed that unless all the schools were located in one place or very near each other, compulsion would not be permitted. So the building was put up, after overcoming opposition from conservative residents. But the proposal for compulsion is still pending with the Government. The revision of an estimate for laying a road from Maharajapuram to Watrap, expected to cost about Rs. 10,000, has long been pending with the authorities and the delay is damping the spirits of the Panchayats.

The Sundarapandiam Panchayat levelled and gravelled a street leading to the Adi-Dravida quarters, improved a well and constructed side drains from it, and also built a bathing ghat for the use of Adi-Dravidas. In one of its hamlets a school house was built and a panchayat school located in it.

The Pudupatty Panchayat has been awakened from its past slumber. Steps were being taken by it to raise funds by taxation for connecting the village with the District Board road leading to Watrap, but now the work is taken up by the Taluk Board itself.

Sanitation.—All the three villages are served by a cousevancy staff appointed by the District Board. The villages have public lights supplied by the Taluk Board and maintained by the Panchayats. The Taluk Board has sanctioned funds for the construction of bore-hole latrines in all the three villages and they should be in progress as this report is being written. The Health Inspector visits the centre frequently and suggests improvements from time to time.

There was recently an outbreak of cholera at Pudupatty. The Supervisor administered medicines to some patients. Fortunately the epidemic did not become serious.

Adult Education.—All the three panchayats maintain libraries, the one at Maharajapuram being a very good one. They are well used by the residents, young and old alike. Our supervisor helps them by selecting books suited to the taste of each. At Maharajapuram the daily "Swadesamitran" is read in a common place regularly either by the supervisor, or in his absence by a villager. A thirst for news is developing and is being satisfied. At Pudupatty, where the newspaper was an uncared for article, the supervisor has been able to induce a few young men to open a reading room.

Agriculture.—Under the instructions and supervision of the Agricultural Demonstrator several demonstration plots were cultivated and the demonstrations were generally successful. The application of bonemeal with deincha as manure gave good results. The introduction of new varieties of paddy—Co. 2, Nellore Saniba and Kichili Samba—is appreciated both for quality and quantity. Karunganni cotton was sown in 60 to 70 acres and though the yield was not satisfactory owing of want of rain, the cotton is appreciated as suitable for spinning. Ploughing with the Meston plough is also recognised as advantageous. The Agricultural Demonstrator who visits the area frequently has been advising the ryots as to the best way of preserving cattle manure, especially the urine. Some are proposing to remodel their cattle sheds in accordance with his advice.

The Veterinary Doctor visited the centre once and treated diseased cattle.

The centre applied for a stud bull to the District Board and the latter sanctioned it. But it was vetoed by Government.

Poultry Keeping.—From the Y. M. C. A. centre at Ramanathapuram where our supervisor underwent training, fertilised Leghorn and Rhode Island eggs were got and hatched at Maharajapuram.

From the chickens a small flock has been raised and fertilised eggs are being sold to selected persons in the area and also to outsiders. The supervisor receives considerable help by way of advice from Mr. Stephen who is in charge of the poultry at Ramanathapuram. Luckily the birds of this centre have escaped so far from the epidemic that has destroyed so many fowls all over South India.

Spinning.—Mr. Alagiriswamy Naidu has got 50 charkas made at his own expense, and they are made available at cost price to the villagers in the area. But so far only 10 have been taken up. The able-bodied of course do not find spinning remunerative. They prefer to fetch fire-wood from the neighbouring hills. The centre proposes to arrange for the supply of cotton and see if that will increase the number of spinners. The supply of cotton is even otherwise desirable, as in Maharajapuram there are about 30 spinning wheels and it is an advantage to keep them at work as far as possible.

Games and Recreation.—Volley ball which was introduced at Maharajapuram by our centre has become very popular. It is played daily and friendly matches take place frequently. The game has also been introduced at Pudupatty where a volley ball club has been started by our supervisor with local contributions. At the outset the young men felt an aversion to it but now they quite like it and even men of 35 and 40 join the game. It is these young men that have started the reading room there already referred to.

The gramophone and the records kept at the centre afford entertainment to the villagers and their hamlets at frequent intervals. The centre is fortunate in having an enthusiastic and steady Honorary Worker in Mr. Alagiriswamy Naidu. More benefits would have accrued to the people of the area if in certain Government quarters there had been a better appreciation of the objects of the centre, and requests like permission to introduce compulsory education, teaching spinning to girls or facilities for maintaining a stud bull, had been granted.

7. MALPANGUDI.

The Centre was opened in October 1928.

A Local Committee consisting of Mr. A. Ranganatha Mudaliar, M.L.C., Dr. R. Naganna Gowd and Mr. K. Krishnagar was constituted, with Mr. Ranganatha Mudaliar as convener. From June 1930, Dr. Naganna Gowd is the convener.

The Supervisor appointed in October 1928, one Mr. Sundaram Iyer, was found unsatisfactory. In April 1929 Mr. Singara Mudaliar, who had had training in agriculture in the National College, Adyar, was appointed and continued till the end of March 1931. Since then the centre is without a supervisor.

This Centre, like Tirupachanur in South Arcot District, has suffered from lack of adequate finance. The Hospet District Bank was in a position to contribute Rs. 1,000 during the first year, i.e., 1928-29. But in the second year it was able to spare only Rs. 309 and in the third year Rs. 360. The centre was able to make up from other sources about Rs. 250. The grant from the Provincial Bank, through the Provincial Co-operative Union, has been proportionate to the sum locally obtained. In June last the Rural Reconstruction Committee of the P. C. U. adopted a resolution which makes it obligatory on a local Committee to raise Rs. 1,000 some how or other locally, if a centre should be continued. Mr. Ranganatha mudaliar, who has now removed himself to Hospet, has undertaken to collect the necessary amount on behalf of the Committee.

The work done so far is given below. The Local Committee decided to concentrate attention for sometime on one village, viz., Malpangudi which is about 3½ miles from Hospet and see the result. The Rural Reconstruction Committee of the Provincial Co-operative Union was agreeable to this course, as the scheme was an experimental one and it was considered advantageous to try different ideas. The Local Committee drew up a programme for the supervisor. As already mentioned, the supervisor appointed in October 1928 did not prove suitable, and another was appointed in April 1929 and sent up in May to Ramanathapuram for training. He took up at first the intensive programme for Malpangudi, and after a time began regularly visiting the surrounding villages for propaganda, distribution of medicines etc.

ACTIVITIES.

Education.—A day school for pauchamas, a girls' school and a night school were started. The Pauchma and the girls' schools had an attendance of 15 to 20. After being conducted for about a year and a half, they were closed as the teachers left the village and no other suitable teachers could be found for the pay. The night school is still continuing. In addition to the vernacular and Arithmetic which are taught to all, English is taught to those who want to learn it. Talks also are given on useful subjects such as sanitation, domestic economy and co-operation. At Koudinayakanhalli a day school and a night school were revived. For the Malapangudi schools a grant of Rs. 107-12-0 was obtained in May 1930.

Games were taught to the children and foot ball introduced. It could, however, be played only when fields were free.

A village library was opened at Malapangudi. Though the number of books is not large, it is being well used. Some weekly vernacular papers are also supplied to the library.

Bhajana is conducted every Saturday and also on festival days. Puranam reading is arranged except during the agricultural season. Two village dramas were got up and enacted.

Sanitation.—The village being malarial, quinine was distributed every day by the Supervisor for a considerable time. Later on, however, the Taluk Board authorities entrusted it to the Board School teacher. Simple medicines for minor complaints also were administered and in serious cases people were persuaded to go to the Government Hospital at Hospet. Quinine and simple medicines were also distributed in the surrounding villages during the weekly visits of the Supervisor. Health week was celebrated and lectures were arranged with the aid of the District Health staff. As a result of all this, and chiefly of quinine distribution, the health of the village has very much improved.

The villagers were persuaded to carry manure away from near houses and to clean the streets. A large quantity of prickly pear was removed from the quarters of the pauchamas.

An attempt was made to provide the village with a number of bore-hole latrines especially for the use of women. Bores were tried in several places, but it was found that they could not go deeper than 7 or 8 feet owing to the presence of rock at that depth. So the attempt had to be given up.

Village Panchayat.— A village panchayat was organised soon after the centre was opened, but it took more than a year for it to be registered and started on work. It is, however, lacking funds and unable to get grants from Government. It has not been able to do any appreciable work. It has applied for the acquisition of land which is needed for the extension of the village site. The matter is pending with the revenue authorities.

Co-operative Society.—Owing to misappropriation of money by the President of the Local Co-operative Society, it was liquidated. Steps were taken to form an agricultural society with membership confined to agriculturists. The society however has not been registered. Meanwhile the villagers have been making use of the Hospet Loan and Sale Society. An attempt made to start separate co-operative societies for the Panchamas and Lambadis respectively through the Labour Department, also did not materialise.

Agriculture.—Much attention was paid by the Supervisor to popularise agricultural improvements. Demonstrations were held in ploughing, in using chemical manures and improved paddy seed, in transplantation of seedlings etc. These improvements are appreciated and are being adopted by the people. Flower cultivation was encouraged and mango grafts from Bangalore were supplied to some.

The centre is maintaining a stud bull of Kangayam breed obtained from the Agricultural Department. It is in good condition and giving satisfactory service. Demonstrations were held with the help of the Veterinary staff in castrating animals by the latest improved method. It is much appreciated. As a preventive against rinderpest the villagers were persuaded to have their animals inoculated by the Veterinary staff, and it was done.

To establish poultry keeping as a subsidiary industry the centre obtained fertilised Leghorn eggs and carefully raised a flock of about 50 chickens. But they all died last year (1930) owing to an epidemic which has ravaged the whole of South India.

A set of bees were obtained from Ramanathapuram and their keeping was tried. So also a hive of wild bees was procured. But they both failed.

A number of propaganda meetings with the help of the magic lantern, and sometimes without it, were arranged at which the staffs of the Agricultural, Veterinary and Health Departments addressed the villagers on the improvements with which they were respectively concerned.

8. TIRUPACHANUR—(South Arcot) Dt.

The Centre was formally opened on 27th April 1928.

A Local Committee consisting of the following gentlemen was formed.

- Mr. R. Krishnaswamy Iyengar, B.A., B.L., Cuddalore.
- „ R. A. Sivananda Mudaliar, Cuddalore.
- „ Rao Bahadur T. Sitarama Reddiar, B.A., B.L., Cuddalore.

Some time after the centre was opened Messrs. A. Nagaraja Iyer, B.A., L.T., Villupuram, and R. Srinivasa Iyer, Olukkai, were added. In the latter part of 1930, consequent on M.R.Ry. Rao Bahadur K. Sitarama Reddiar Avl., leaving Cuddalore, Mr. V. Srinivasa-chariar, B.A.B.L., Cuddalore, was appointed in the place of the former.

Supervisor :—There was some difficulty in finding a suitable supervisor for this centre. After one or two refusals, Mr. Lakshmana Rao, Co-operative Supervisor in the service of the District Federation, was appointed and joined duty in April 1929. He reverted, however, to the District Federation at the end of September '30. For a few months thereafter Mr. R. Srinivasa Iyer temporarily looked after the duties of the Supervisor. But from February last the centre is without a full time worker and work is at a standstill.

The centre also has had unexpected financial difficulty. The Co-operative District Bank of Cuddalore made a grant of Rs. 1,000 during 1928-29 out of its common good fund. Next year it reduced it to Rs. 500 and in the next year made no grant whatever. The grant of the Provincial Bank being conditional on the grant of the District Bank, the centre is left without resources. It is for that reason that no supervisor was appointed after the reversion of Mr. Lakshmana Rao. The following report therefore refers only to the period when the centre had the services of a supervisor.

The following villages were included in the area of the centre:—

- | | |
|-----------------|-----------------|
| 1. Triupachanur | 6. Dalavanur. |
| 2. Kandamanadai | 7. Olukkai. |
| 3. Kadambakam | 8. Pidagam |
| 4. V. Ariyalur | 9. Kaveripatnam |
| 5. Pillur | 10. Kolattur. |

To start with, the Supervisor visited every village and did educative propaganda regarding the aims and objects of the rural

re-construction scheme, for which printed leaflets also were distributed. At the same time he conducted a preliminary survey of the condition of each village in order that the committee might be enabled to draw up a suitable programme for each village. A conference of the people of the area was called in July 1929 at Kandamanadai, at which the requirements of the different villages were ascertained.

Co-operative Societies.—The Supervisor was instructed by the Committee to concentrate on the improvement of co-operative societies, which were in existence in all the villages included in the centre. Intensive educative propaganda was carried out with and without the aid of a magic lantern and a training class arranged at Kandamanadai. Then the societies were taken up one after another and rectified. The result was a substantial improvement in collections and in the working of the societies. The main part of the supervisor's time was taken up by this.

Village Panchayats.—When the centre was started there were two village panchayats in the area, viz., at Olukkai and Dalavanur. By the efforts of the supervisor and Mr. Srinivasa Iyer new panchayats were organised at Pillur, Tirupachanur, Kandamanadai and Pidagam. A leaflet explaining in Tamil what panchayats could do was printed and distributed among the villagers. The supervisor attended all the meetings of the panchayats and guided them in their work. Grants for the sanitary improvement of the villages were made out of the rural re-construction fund by the local committee, from which prickly pear was removed and some minor improvements were effected. Proposals for works and taxation were sent up and the Pillur Panchayat was induced to take up Kudimaramath and water distribution.

Education.—Parents were exhorted to send their children, especially girls, to schools which exist in almost all the villages in the area. At Pillur, where no school existed, steps were taken to start a panchayat school. Night schools were started at Tirupachanur, Dalavanur, Kandamanadai and Pillur, and the teachers were paid by the rural reconstruction committee. The District Educational authorities were addressed to recognise the night schools and also to permit Board school teachers to teach in them.

The students of the night school at Dalavanur got up two small plays about Village Panchayats and Co-operative Societies and enacted them in the village.

Circulating Library.—The centre spent about Rs. 100 on Tamil books and maintained a circulating library. The daily

Swadesamitran and magazines useful for panchayats and co-operative societies were subscribed for and circulated. The circulating library was specially well availed of by literate women. At Dalavanur a lady read out regularly stories from *Kamayam* to women audiences.

Medicine Chest.—Two medicine chests were kept in the centre and the supervisor gave medicines for simple ailments as per instructions supplied with the chests. These medicines attained a high degree of popularity.

Agriculture.—The agricultural demonstrator of Villupuram was taken to all the villages and various improvements were explained by him with the help of magic lantern slides. Demonstration plots were arranged in five villages to show the advantages of using iron ploughs, selected seed, economic transplantation and bonemeal manure. Manure pits were dug at Pillur and Dalavanur. An agricultural association was formed in the area for popularising agricultural improvements.

Spinning.—Demonstrations in spinning were held in all the villages. A few spinning wheels were got and the supply of cotton was arranged for by the centre. But shortly after this work was begun the supervisor left the centre and the work did not progress.

Miscellaneous.—The gramophone and magic lantern slides supplied to the centre were well used. Abstinence from drink was preached in all the villages by the Supervisor and Mr. Srinivasa Iyer.

APPENDIX A.

RURAL RECONSTRUCTION—A SCHEME

BY THE HON'BLE MR. V. RAMADAS PANTULU.

The XVI Madras Provincial Co-operative Conference passed the following resolution regarding rural reconstruction through the help of co-operative institutions:—

“This Conference resolves (a) that the Provincial Co-operative Union, in co-operation with the Madras Central Urban Bank, District Banks and District Federations, should take immediate steps to start at least six rural reconstruction centres in the Presidency and to bring about a co-ordination of the work of the Agricultural, Co-operative, Labour, Industries, Hygienic and Educational agencies for a collective programme of regional development being initiated; and (b) that some competent rural reconstruction supervisors be trained for the work”.

Plan of operation.—It is therefore the duty of the co-operative organisations to take up the task immediately. It is obviously impossible to work on a provincial scale. The work must of necessity be confined to certain centres. The minimum number *six* mentioned in the resolution cannot be exceeded in the coming co-operative year. There are two ways in which a centre may be fixed; it may be either a single village for model development or a small group of villages, say within a radius of 7 miles, for intensive reconstruction work. After giving my best thought to the subject, the latter alternative appeared to me to offer far more advantages than the former. Under this scheme, one *firka* in each of six select districts should be taken in hand in the next co-operative year. I prefer to leave out West Coast districts in the first year, having regard to the difficulty of organising village work in the distant and scattered villages of Malabar as judged by the experience gained in working the Village Panchayat Scheme in that part of the province. I would suggest that three centres in Andhra Desa and three in Tamil Nadu should be selected for next year's work. A trained rural reconstruction supervisor should be placed in charge of each *firka*. The headquarters of the *firka* should, as far as possible, be the same as that of the local co-operative supervising union. This will enable the Union supervisor and the reconstruction supervisor to collaborate in their work. The headquarters should be in a central place in the area of operations and easily accessible by railway, road or canal for frequent visits by rural leaders interested in the work. It should preferably be a village in which a co-operative society and a Village Panchayat are already working, where one such is available. If the local union headquarters is inconveniently situated, it should be shifted to the reconstruction centre.

Programme of work.—Two important principles have to be borne in mind in settling our programme of reconstruction work. The main aim of rural reconstruction should be the reconstruction of the mentality of the villager by propaganda and education specially in the social and economic spheres of rural life. Charitable doles of money or cheap credit thrown into the villager's pocket, whether by official or non-official agencies, will only serve to make him more dependent and less self-reliant. If the financial assistance rendered to the ryot is not closely associated with the inculcation of co-operative principles, his position may become worse. Mr. Wolff is therefore never tired of emphasising this truth. The next essential principle to be borne in mind is that any reconstruction scheme should embrace all sides of the activities of the village life which are compendiously described in Sir Horace Plunkett's classification of the ten principal needs of a farmer as "business needs" and "social needs". Mr. MacNeil summed up the idea in the words "Better Farming and Better Business would be a soulless thing without "Better Living".

With these ideals in view, a simple and workable programme has to be framed in accordance with local needs and conditions. Its general features may be briefly stated. The duties of the supervisor shall be to plant in each village in the firka a co-operative society, a village panchayat under the Act of 1920, an elementary school for the village children and a rural dispensary for medical relief (it may be of the Ayurvedic type). A primary land mortgage bank operating over the entire area of the firka should also be established. The statutory village panchayat should be made the main instrument for the reconstruction work. No other agency can comprehend within its scope all the spheres of the village activity. Voluntary associations without legal sanctions are difficult both to organise and to sustain. A village panchayat under the Act of 1920 is a corporation and enjoys power of local taxation for common good. It has also certain plenary powers. The Registrar-General of Panchayats describes the work which a panchayat can do in these words: "That work will be based on a detailed survey of the conditions of village life in all its aspects in every panchayat area. The panchayat and the supervisor are to collaborate in the preparation of the survey. The panchayat will then take the steps for improving the amenities of village life in all directions." The control of village services, the renovation of village temples, tanks and wells, the administration of village commons and charitable inams will be in the sphere of the panchayat's activities. Financial help, where forthcoming, from the co-operative organisations, local boards and the Government, may be availed of. The co-operative societies in the area can make small contributions from their common good fund for the maintenance of village libraries. The Government is at present financing panchayat-managed village schools by making a non-recurring grant of Rs. 80 per school for initial

outlay and a recurring annual grant of Rs. 180 for each teacher employed. In the reconstruction area education for children should be made both *free* and *compulsory*, a policy to which the local government has now agreed. Compulsory physical culture on the indigenous system (talim-khanas and national games) should be a feature of these schools. The Local Government is also making grants for the development of roads and preservation of drinking water in villages on the basis of a half and half contribution, that is, a sum equal to that found by the village itself. The co-operative organisations in the area can be made to render effective help to the agriculturists by advancing capital and credit needed for the industry, by co-operative purchase of seed, manures and necessaries of life for them on indent system, by promoting economic marketing of agricultural produce and in other ways. A very useful and interesting experiment could be made in one select village in each firka of taking over all the indebtedness of the agriculturists in the village and arranging for its being wiped out in a number of years through the agency of the rural credit society and land mortgage bank. It will also be the duty of the supervisor to put the villagers in touch with the agricultural demonstrator, the veterinary surgeon and other itinerant officers, who are expected to render assistance to them in the respective spheres of their official duties. Three more activities should be mentioned. There should be some programme of adult education in all the villages in the experimental centre. Attention should be paid to the revival or encouragement of such cottage industries as may be familiar to the villagers with special emphasis on the charka and also handweaving where possible. The improvement in the housing of the Depressed Classes who now live in most insanitary localities on the outskirts of villages and providing other amenities to them should be an integral part of the rural reconstruction scheme. These classes should be freely elected to village panchayat boards and admitted into the village schools. This list of reconstruction activities may look formidable on paper, but the activities are all related to the daily life of the villager and will be found to be capable of being easily carried out if there is a plan and organisation of work.

Cost of the Scheme.—In view of the slender resources at the disposal of the co-operative institutions, the cost of each centre should not exceed Rs. 2,000 per year. The Central Bank in whose banking area the centre is selected should make an annual contribution of Rs. 1,000 and the Madras Central Urban Bank should make a like contribution for each centre. Thus it will cost Rs. 6,000 to the Madras Central Urban Bank in the next year. This sum may be allotted from its common good fund which amounts roughly to Rs. 15,000 a year. The salary and allowances of the supervisor should be fixed at a sum not exceeding Rs. 100 a month. He should be given a peon on a monthly pay Rs. 15 and about Rs. 30 a month should be set apart for the publication of

leaflets and distribution of other propagandist literature. The cost of each centre will thus be roughly Rs. 2,000 a year. The union supervisor shall assist him in some of his activities specially on the co-operative side. I understand that local bodies are being encouraged to constitute a Rural Reconstruction Fund, but that the scheme has not matured owing to the reluctance of the villagers to bear additional taxation. If each Taluk Board levies and earmarks an additional one pie of land cess in the rupee, it will yield $5\frac{1}{2}$ lakhs per year and with an equal grant which Government has promised, a sum of Rs. 11 lakhs will be available every year for rural reconstruction work. The question may be re-examined and village opinion ascertained.

The success of the scheme will largely depend upon the interest which the educated middle class Indians will evince in the problems of rural life and nation-building and the extent of rural bias which they can cultivate in the immediate future. A National Government would have employed thousands of intelligent young men in this task of national reconstruction and turned their latent energy which is now running to waste, to good account in the cause of the Motherland. But as we are at present circumstanced, it is a vain hope. The apathy of the government to Nation-building programmes is evident from the manner in which the $3\frac{1}{2}$ crores of rupees gained by the remission of Provincial contributions have been allotted between Reserved and Transferred departments. But there is no reason for despondency if even some among our middle classes realise their responsibilities to the nation and resolve to contribute their legitimate share to the cause of nation-building. India is as a matter of fact rich in human material. It needs mobilising. Let those who are called upon to render this contribution remember that a regenerated village with its corporate life and sense of civic responsibility developed will be the true foundation of a lasting Swaraj for India.

APPENDIX B.

THE MADRAS PROVINCIAL CO-OPERATIVE UNION.

Instructions and hints to Rural Reconstruction Supervisors.

1. Make a list of the villages included (by your local committee) in the Rural Reconstruction area and hang the list in the office.
2. Keep a map of the Rural Reconstruction area. You will be able to draw it for yourself from the taluk map, which you can buy from the Taluk Office or borrow from an officer of Government.
3. Draw up a programme for each village for each quarter. Place it before the Local Committee and get their approval for it. And then stick to the programme and carry it out.
4. As far as possible visit the villages regularly. If you are dealing with only five or six villages, you can make weekly visits and fix what day of the week you visit each village. The villagers should know on what day to expect you ordinarily.

It is advisable to make weekly visits rather than visits at longer intervals. For this reason confine your attention in the beginning at least to about five villages. Later on, fortnightly visits may suffice.

Try to spend the night in the village. At any rate, do not leave the village without spending some hours each time and talking to a number of people.

5. Make a general survey of each village. Collect statistics relating to population, crops, castes, endowed or inam lands, poramboke lands, cottage industries, schools, occupations etc.
 - (a) Note specially the communal properties, such as lands endowed to temples, poramboke lands, sources of income for the village etc. This information will be useful for the formation of a Panchayat.
 - (b) Open a book for the village which is your headquarter. Therein give a page for each family. Note down the names of all members of the family with age, sex, occupation, literacy, health, economic condition of the family, i.e., income etc. The object is to pay individual attention to each family so as to suggest ways of improvement to the family in respect of occupation, education, housing, health etc. After your headquarter village is finished, you may open a book for each of the other villages.

6. Study the condition of the *Co-operative Society* in each of the villages in the Rural Reconstruction area. Begin with the society in your head-quarter. You must make yourself thoroughly conversant with its affairs. Remember that this Rural Reconstruction Scheme is drawn up by co-operative institutions and financed by them. Be thorough with the Co-operative Manual of which a copy is supplied to you.

Our object is to see that *the Co-operative society yields the utmost benefit to the village*. The Society must be worked in the right co-operative spirit. *It must be rectified and overhauled*.

- (a) The objects and benefits of the Co-operative Society must be explained to the present and prospective members at meetings and in personal talks. The bye-laws should be explained and the achievements of co-operation in foreign countries and in this country should be explained. Monthly or fortnightly meetings should be convened.
- (b) The panchayatdars should be enthused in the society. They should be induced to set a good example to other members.
- (c) Short-term loans and thrift should be emphasised.
- (d) The value of character, leading to personal credit should be stressed. The Panchayat should be instructed that the aim of the society is to improve the members as *men* and that in admitting persons into the society and in granting loans, *Character* more than property should weigh with them.
- (e) Men of character of different castes should be induced to join the society. The reputation of the society for honesty, equity and a desire for public welfare should be so raised that to be a member of the society should be recognised as a certificate of character and confer a status on the member.
- (f) The needs and circumstances of each member should be studied and advice given as to how *expenditure may be reduced*, as by giving up drink and simplifying marriages and other social functions; and as to how *income may be enhanced* as by collecting and preserving manure, using better seeds, ploughing with iron plough, raising fodder crops, looking after cattle well, bunding the fields, finding work for women by means of the charka or by keeping a buffalo or hens etc.
- (g) Study the articles which the villagers purchase from towns or other villages such as food grains, cloth, salt, kerosene oil, chillies etc. Compare the prices at which they obtain these with the prices in the town. See whether it would be possible to help them in this respect through the Co-operative Society.

One of the villagers is probably keeping a shop. Is he exploiting the people or doing business fairly? It is not advisable to open a store in the village, but things may be got in bulk and distributed. In other words, the indent system may be tried.

- (h) Study the produce that is sold from the village. Perhaps you may not be able to help in this matter, but the information should be collected.

For the success of this programme tact on your part is essential. You should be recognised as the universal friend. *Seek the help of the Co-operative Union and the Supervisor.* Do not antagonise them. Remember that you have no authority over the society or its members. You have to do things only by persuasion. Always appeal to the better nature of the members and of the helpers.

For rectifying a society the District Bank, the Federation the Union and the Rural Reconstruction Centre should thoroughly co-operate. Invite the help of those bodies and see that all societies are rectified.

To go through this programme needs much time and patience. But the work is worth all the trouble.

7. Next to the co-operative society in importance is the Panchayat as an organisation for improving the conditions of the village. Study the Panchayat Act and Rules. You must have a copy of these, as of the Co-operative Manual. You may not be able to organise Panchayats in all villages in the area; but try to organise them in some villages at least.

For that you should seek the help of an Honorary Organiser. This you can do through your local committee.

After the Panchayat is organised you have to help it in the correspondence, the selection of works, their execution etc.

Through the Panchayat the following items can be attempted: improvement of

- (1) Sanitation of the village—Removal of prickly pear, avoiding nuisance, provision of a sheltered place for women, closing up pits etc.
- (2) Securing good water supply by means of a well or tank. The former is to be preferred.
- (3) Levelling of streets, raising and draining them, laying a connecting road from the village to the District Board or provincial road.
- (4) Schools: (a) for children—boys and girls.
(b) for adults—night schools.

8. *Improvement of health.*—Have a medicine chest. The Centre will supply you with one or more. Encourage people to go to you. This makes you useful and friendly to the people. The medicine chest is intended only for common ailments. In serious and difficult cases advise the patient to go to hospital. You may take them there yourself in one or two cases.

You must yourself know something about the human body (physiology), the functions of the main organs, the rules of health, food values etc. Medicine is curative; Hygiene is preventive.

Spread the knowledge in the village.

9. Even though a Panchayat may not be organised, the items for which a Panchayat is intended should be attended to by you.

Firstly.—The school. Is there one in every village? How many teachers are in each school? Are they regular? What is the attendance? *Drive the children, both boys and girls, to school.* This is a primary duty of yours.

What of the Panchama children? Is there a separate school for them? How many such children are there in the village? You must devote special attention to them. A school could be got for them from the Labour Department.

Be in touch with the teachers. Interest them in your work. Seek their co-operation. The teachers can be more useful for our work than perhaps any others in the village.

Secondly.—Drinking water supply. If a well be needed, get at the Taluk Board or get the people to dig a well and the Rural Re-construction Centre may give some help from its funds for parapet wall and pully and so on.

Thirdly.—Levelling of streets and lanes. It can be done without much expense if only you interest the people. The bigger landlords may give the help of their servants for work and the use of their carts for carting earth etc. The Rural Re-construction Centre also may spend a small amount of money if necessary.

Fourthly.—Keeping the village surroundings clean should be attempted. In the Tamil Districts in particular, induce people to go out with *chembus* for answering calls of nature. A suitable sheltered place for women must be set apart. For this a small grant may be given by the Rural Re-construction Centre.

10. Organise games and physical exercises especially for school children. You should know scouting. Get trained as scout master or take the help of a scout master and organise informal scout troupes in all the villages in the Rural Re-construction area. The Provincial Co-operative Union will give the help of its Physical Instructor.

Foot ball is a cheap game and so is Volley ball. You should have a book of games for children.

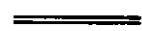
Sports—running, high jump, long jump and putting the shot may be easily organised. Particularly in this take the help of the school-masters in each village.

11. (a) Organise Bhajana in each village if possible. Also the getting up of plays by school boys and girls.
- (b) Periodical or occasional lectures. Get well-known outsiders to deliver lectures or to preside. People will not easily attend. Don't be discouraged by difficulties.
- (c) A Reading Room and a Circulating Library for the Centre. See in particular that books suitable for women are kept in the library. Encourage meetings of women and reading of books and newspapers by them.
- (d) Magic lantern lectures on co-operation, agriculture, health etc. should be arranged. A lantern will be supplied to the Centre by and by. But even without waiting for it you could begin with the help of the various authorities—agricultural, public health, educational etc.
- (e) A gramophone is supplied to you with a dozen record plates. Make good use of it. It is intended to attract people to you. Use it for all classes of people. Have special performances for women and the panchamas. Take the gramophone to the latter once or twice in each village. The gramophone need not necessarily be made a preliminary to a meeting. The plates may be put on the machine just to give enjoyment, especially to children, women and the poorer classes.



DEDICATED
TO
THE MEMORY OF
MY REVERED FRIEND AND MUNICIPAL GURU
THE LATE KHAN BAHADUR
PIRZADA MUHAMMAD HUSSAIN C. I. E.

**MUNICIPAL PROBLEMS
IN DELHI.**



LALA SHRI RAM





SHRI RAM

The aim of this brochure is to give a brief account of the administration of the Delhi Municipality during the last ten years, to point out to the Committee the necessity of casting off the torpor and ennui that would appear to have taken hold of it at a time when enormous responsibilities have to be shouldered, to indicate the directions in which its efforts might usefully be employed in the immediate future and to draw the attention of the Government, Central and Local, to the needs of the Municipality occasioned by the large increase in the city population. It falls into three broad divisions:—

1. A survey of the improvements that have been effected in the ten years ending March 1931;
2. A programme of constructive work for the next few years and suggestions for ways and means of achieving the further reforms; and
3. A scheme for the extension of the city.

It is not my purpose in this review to deal with the constitution of the Municipality, its progressive democratisation, the public interest displayed in its elections or the extent and value of the political education acquired by its citizens.

Politically, Delhi has always held a high place among Indian cities. It has been and is the scene of great and significant events. It does not perhaps occupy as prominent a position as regards provision of civic amenities, but the explanation is not far to seek. It lies in the fact that it is far easier to build a new city than to modernise an ancient one. Grafting of present-day institutions on an archaic structure has never been an easy task and twentieth century civic improvements and seventeenth century town-planning go ill together. Ours is a strange heritage: impregnable fort walls which effectively circumscribe the city's limits and which render impossible the expansion necessary for coping with the increasing population; dried-up moats and canals which serve the public as a dumping ground for refuse and which abundantly breed disease germs; streets and *gullies* whose width is so small that in places two people cannot pass abreast and where the sun never shines; streets and *gullies* which are, moreover, reminiscent of the days when, for the sake of protection of lives and property, people built houses very near one another's—in fact far too near to permit

of sanitary conditions prevailing--to be united in battle against invaders and, not unoften, to be united in death in a general massacre; and innumerable graves and sepulchres located haphazardly in all conceivable places. It is well to constantly bear these facts in mind when reading the pages that follow.

The city of Delhi, including intramural and extramural portions, covers an area of 6.02 sq. miles and its population was 2,25,471 in 1911, 2,48,302 in 1921 and 3,47,592 in 1931. In point of size, it is perhaps the smallest of the cities accommodating a population of this number.

The primary functions of a Municipality are:

- "1. The construction, up-keep and lighting of streets and roads and the provision and maintenance of public and municipal buildings;
- "2. Public Health, including medical relief, sanitation, drainage and water-supply; and
- "3. Education."

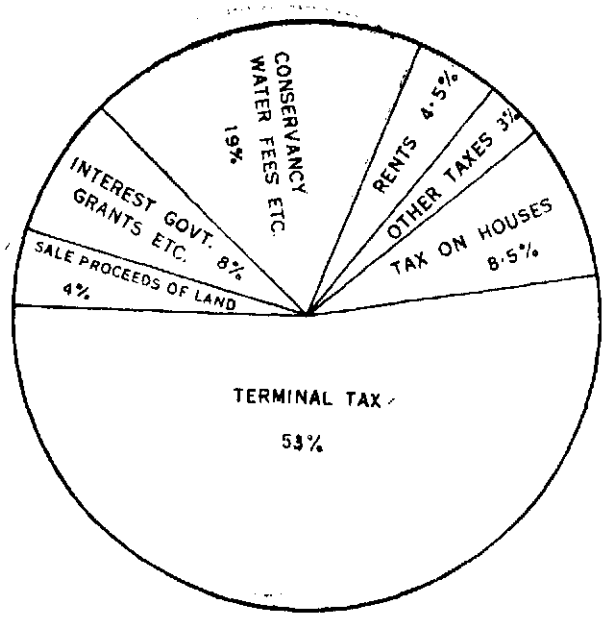
Funds for performing these functions are obtained by the levy of tolls, a tax on buildings, a tax on animals and vehicles, terminal tax and taxes imposed in return for services rendered such as water-rate, etc.

The revenue and expenditure of the Municipality in the year 1911 and from 1921 to 1931 are as given below:—

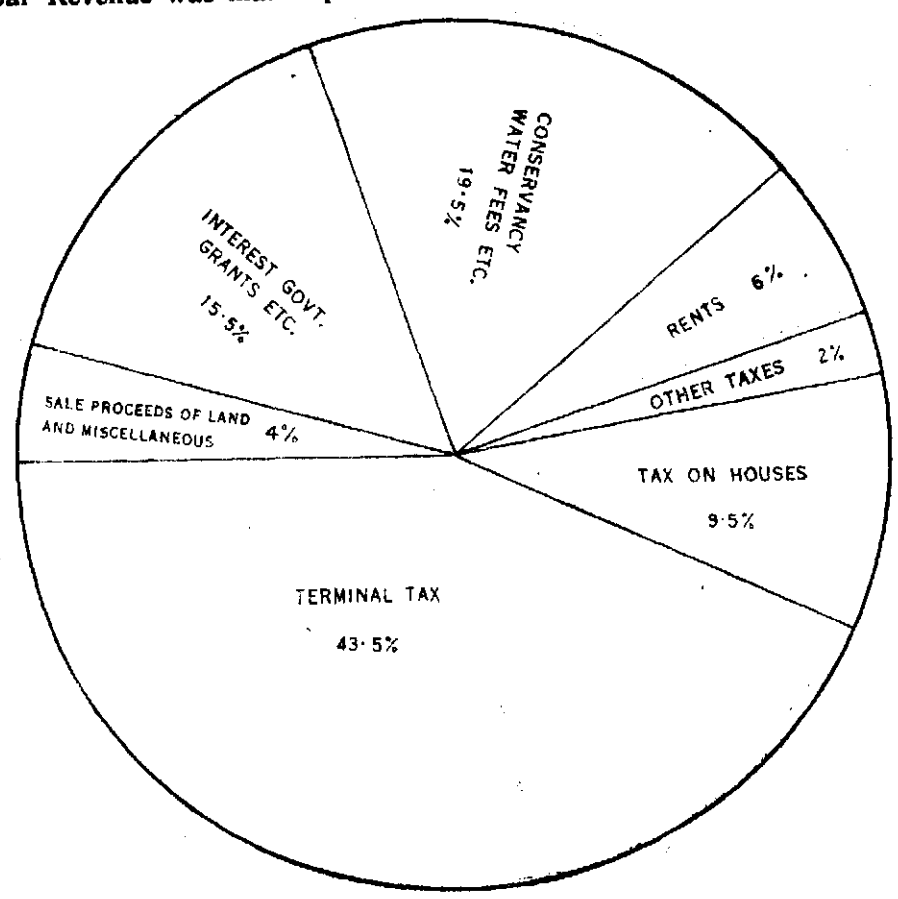
| Year. | Revenue. | Expenditure. |
|---------|-----------|--------------|
| | Rs. | Rs. |
| 1911 | 9,73,759 | 8,53,441 |
| 1920-21 | 16,54,968 | 19,22,252 |
| 1921-22 | 19,61,790 | 17,36,159 |
| 1922-23 | 18,20,424 | 15,24,640 |
| 1923-24 | 18,57,945 | 22,28,196 |
| 1924-25 | 19,08,108 | 16,33,346 |
| 1925-26 | 23,49,427 | 27,69,063 |
| 1926-27 | 25,48,415 | 25,37,178 |
| 1927-28 | 25,77,874 | 25,74,492 |
| 1928-29 | 24,01,346 | 23,41,874 |
| 1929-30 | 24,54,100 | 24,17,343 |
| 1930-31 | 25,83,400 | 26,05,809 |

The constituents of municipal revenue and the heads of expenditure in the years 1921 and 1931 are shown below in the form of a diagram:—

How each Rupee of Municipal Revenue was made up in 1921 and 1931.

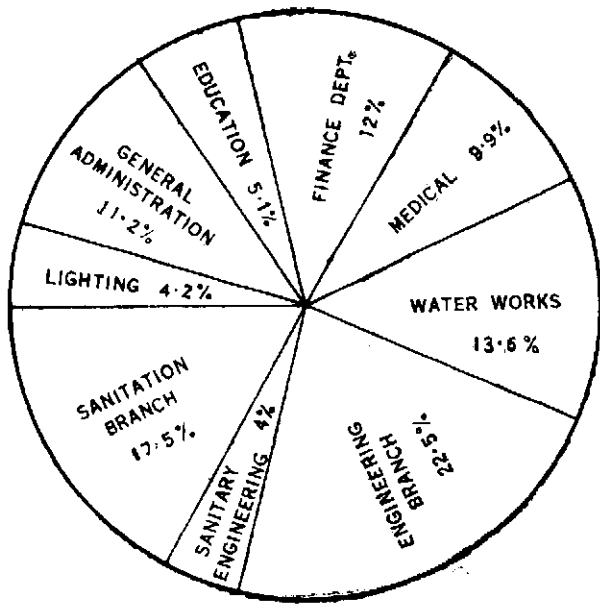


1921.

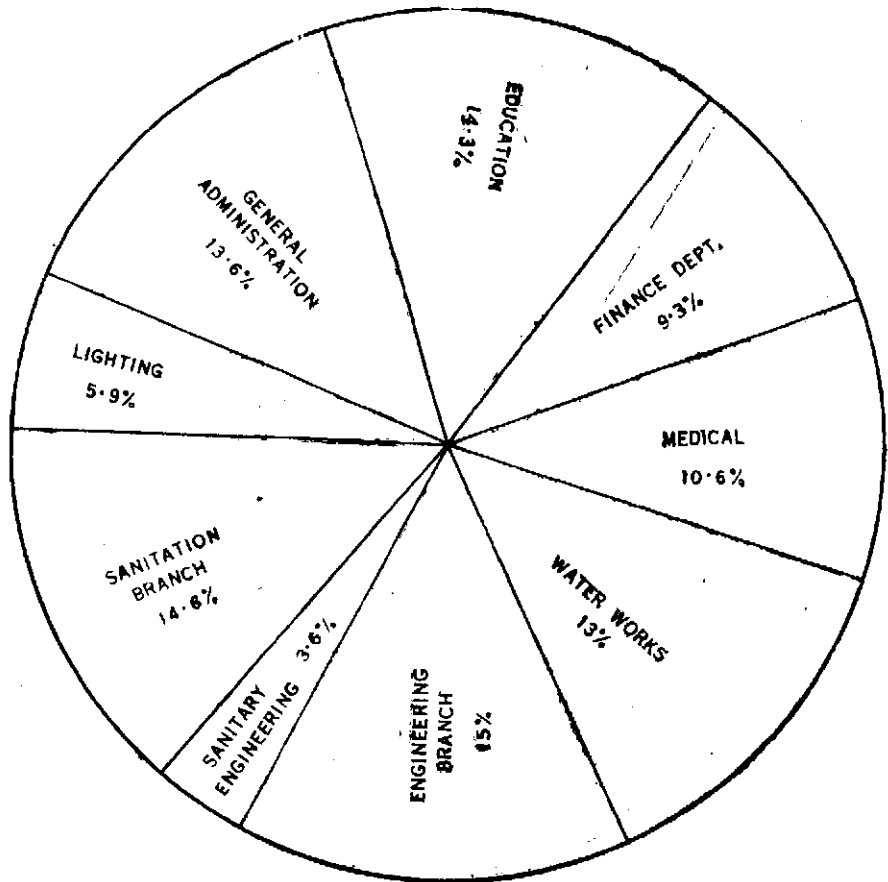


1931.

How each Rupee of Municipal Expenditure was made up in 1921 and 1931.



1921.



1931.

Terminal Tax has always contributed the largest share of municipal revenues, bearing in 1920-21 the proportion of 53 per cent to the total revenues and in 1930-31, 43.5 per cent. The financial strength of the Municipality, therefore, lies in the active commercial spirit of its citizens and the fostering of this spirit should be its special care. On the academical question of its soundness or otherwise it is not the purpose of this review to enter, though it must be admitted that too much reliance is placed upon it and that whenever additional revenue has to be found it is invariably the first to be exploited. A consumption tax is perhaps the most convenient as well as the least unpopular form of exaction but it is necessary to guard against overstraining it.

The house tax in Delhi was fixed in 1901 at the rate of Rs. 3/2 per cent on the annual rentals of all buildings within municipal limits. Mosques, temples, churches, schools, hospitals dispensaries and orphanages are exempt from the tax. The tax on houses yielded 8.5 per cent of the total revenue in 1921 and 9.5 per cent in 1931 and has, in the ten years of review, kept pace with the growth in general revenues.

Other taxes such as tolls for the maintenance of roads, taxes on animals, vehicles and hackney carriages brought in about 3 per cent of the revenue in 1921, and 2 per cent in 1931.

Rents which include *Nazul* rents, rents from *sarais*, *takhats*, *chabutras*, colonnades etc. account for 4.6 per cent of the revenue in 1921, and for 6 per cent in 1931.

Other sources of income which are in the nature of payments for services rendered by the Municipality are conservancy receipts, fees and revenue from medical and educational institutions, and from slaughter houses, license fees from dangerous and offensive trades, and fees from the sale of water, all of which yielded 19 per cent of the income in 1921 and 19.5 per cent in 1931.

There are also a few other receipts such as interest on investments, receipts for water connections, Government grants, and extraordinary receipts such as refunds and recoveries, costs recovered in law-suits etc. which formed in 1921, 8 per cent of

the revenue as against 15 per cent in 1931.

The percentage of expenditure on the collection of these taxes in relation to the revenue under each head is as follows :—

| | 1921-22 | 1930-31. |
|--------------------------|---------|----------|
| Terminal Tax | 8.2 | 7.1 |
| House Tax | 8.8 | 9.8 |
| Animal & Wheel Tax | 21.9 | 12.8 |
| Hackney Carriage & Thela | | |
| License fees | 4.7 | 6.01 |
| Rents | 5.7 | 2.6 |
| Slaughter-house Receipts | 19.0 | 14.2 |
| Sale of water. | 3.0 | 3.4 |

Side by side with a rising revenue during the ten years under review, there has also been a growing expenditure. An increase in the expenditure of a local board or municipality, provided of course that the equilibrium between the expenditure and the revenue is maintained and there is no wastage or mismanagement, should be regarded as representing the value in terms of money of the additional comforts and conveniences provided to the citizens. The departments in which greater activity has been shown—and hence increased expenditure incurred—are those of public health, sanitation, water-supply, education, roads and drainage, in fact, all the vital and expanding departments of every civic administration. Cities do not grow, they must be built; and in the building of them effort and money must be expended. The table given below shows the cost to the Municipality of the several departments in the years 1921 and 1931 :—

| | 1920-21 | 1930-31 |
|------------------------|----------|----------|
| | Rs. | Rs. |
| Sanitation | 3,34,926 | 3,81,880 |
| Sanitary Engineering | 75,729 | 95,261 |
| Engineering Branch | 4,33,263 | 3,91,114 |
| Water Works | 2,62,324 | 3,36,576 |
| Medical Relief | 1,90,774 | 2,75,829 |
| Finance Department | 2,32,407 | 2,44,160 |
| Lighting | 80,858 | 1,54,090 |
| Education | 98,931 | 3,72,926 |
| General Administration | 2,18,088 | 2,74,963 |

Sanitation and Sanitary Engineering

Of all the services which a municipality provides the one that takes precedence is sanitation. Citizens will readily admit that the city has, comparatively speaking, been made cleaner. A number of permanent improvements have been effected in the drainage system of the city. When the Emperor Shah Jehan founded the city, he built a number of underground drains and the main drainage of the city still passes through them. But the drawback with these *Shah Jehani* sewers is that they have flat stone sides and unplastered beds, and some of them had on that account fallen into desuetude or had silted up. These have been remodelled to a length of 8000 feet and brought into use. Deep and wide side drains have been replaced by shallow and narrow drains, thus improving the sanitation and the width of the lanes. As untrapped drain inlets and insufficient ventilation of old sewers are a serious menace to health, several *gullies* leading to the sewers have now been trapped and shafts for the proper ventilation of sewers have been provided. Further, since 1921, systematic remodelling of several minor intercepting drains has been carried out. A system of providing reinforced concrete storage tanks for latrines has been introduced. In a general survey of this kind it is impossible, without adding greatly to its size, to mention any but the more outstanding improvements. Consequent on the improvements effected in the city roads and in the city's water-supply, the city drainage is also in a better condition today. In the period under review a length of 20,000 feet of pipe sewers has been laid. Important works done in recent years include the drainage of the Paharganj—Main Bazar, the laying of pipe sewers and construction of surface drains in the developed portions of the Paharganj extension. The flushing of drains, the construction of a number of water-borne latrines, of properly screened water-flushed urinals and of *dalaos*, have added to the cleanliness of the city. Surface drains which in former years used to be laid without *pucca* beds are now constructed with lime concrete beds and cement rendering.

Engineering.

Under this head are included the construction and

maintenance of roads and streets and of public and municipal buildings. Good means of communications greatly assist business and social activities of a town while bad roads impede them. Every year the Municipality has provided the city with a number of roads with a firm smooth surface, with the result that the road mileage today is about 125, about twenty of which, or expressed differently, 16,00,000 sq. yards of road surface have been laid or constructed in the last ten years. All the main thoroughfares have been treated with asphalt, some with the very expensive method of asphaltic concrete, asphalt macadam and semi-grouting, while several of the important lanes have been surface-treated with asphalt. The areas thus treated are :—

| | |
|---|------------------|
| Surface treatment of roads with asphalt | 40,000 sq. yards |
| Asphalt concrete | 7,000 „ |
| Asphalt macadam | 11,000 „ |
| Asphalt semi-penetrative | 4,500 „ |

Many important roads have been constructed in the western extensions, which have now been linked up with the city by means of the Ajmere Gate Overbridge. Lanes to a length of 12,000 ft. have been paved with red stone slabs, to a length of 3,000 ft. with cement concrete and of 6,000 ft. with stone setts. A scheme for metalling all the *kachcha* lanes within a period of three years was framed and the first instalment of work was taken in hand in 1930. Many sharp corners in congested parts of the city like Barh Shah Bula, Hauz Qazi, Mori Gate and Qutab-Sadar crossing have been improved. Narrow roads like Dariba Khurd, Maliwara, Kinari Bazar, Lal Kuan Bazar and Charkhewalan have been widened by the filling up of the deep and dangerous side drains.

The work of the Engineering Department also includes the provision and maintenance of municipal buildings such as hospitals, dispensaries and schools. Prior to 1920, all the city dispensaries, with the exception of the Sadar Bazar Dispensary, were housed in rented buildings. During the last ten years, however, the Municipality has constructed Lal Kuan, Bara Hindu Rao, Paharganj and Lahori Gate Dispensaries with the necessary residential accommodation for the staff. Mention must here be made of Paudit Sri Ram and Lala Madan Mohan

Lall whose munificence has greatly assisted the Municipality in the construction of two of these dispensaries. The dispensary at Sadar Bazar has been considerably altered and improved, as has been the Infectious Diseases Hospital, whose accommodation in addition has been much extended.

Out of the 51 schools under the control of the Municipality, four are located in municipal buildings. The Subzimandi and Mori Gate schools were built and the Karol Bagh and Kabuli Gate schools were extensively improved by the Municipality. The municipality is trying to house more of its schools in its own buildings and progress in this direction must be accelerated.

Several terminal tax posts such as those at Lahori Gate, Queen's Road, Gur ki mandi, Paharganj and Hamilton Road have been built so as to provide better accommodation for the office and staff. For the largest item of municipal revenue to be safeguarded, in addition to a vigilant staff, there should be a proper place for them to work in.

In the none too prosperous years for the Municipality and with allotments not over-generous, it should be a matter of surprise that so much good work has in fact been accomplished. This is probably the only head in which expenditure actually shows a decrease in 1931 as compared with that in 1921.

Public Health.

Medical relief and measures against epidemics are, with sanitation, parts of the scheme of public health and are an important branch of the Municipality's activities. A comparative statement is given below of the number of hospitals and dispensaries, the number of patients treated and the expenditure incurred for the years 1921 and 1931 :—

| | 1921 | 1931 |
|--------------------------------------|--------------|-----------|
| Number of Hospitals and Dispensaries | 9 | 14 |
| Number of patients treated | 2,11,822 | 14,91,288 |
| Expenditure | Rs. 1,90,774 | 2,75,829 |

It may be interesting to note that in the year 1930-31, with an expenditure of only Rs. 28,772, patients to the number of 4,57,143 were treated in indigenous dispensaries.

Not only has the Municipality maintained these fourteen hospitals and dispensaries but it has given liberal grants to Dr. Shroff's Eye Hospital, the A. U. T. Medical College, St. Stephen's Hospital and the Victoria Zenana Hospital.

The city has, during the last few years, been comparatively free from devastating epidemics but any permanent eradication of them will depend in part on the opening of our slums. Within the city and surrounding it, there are not a few of these slums whose squalor and filth are indescribably loathsome, and from which arises, to use Falstaff's words "the rankest compound of villainous smell that ever offended nostril". Slums are the hotbeds of disease and any scheme of public health improvement which does not reckon on their clearance will be futile. A grant towards expenditure under this head has kindly been sanctioned by the Government of India in 1929 and schemes are in hand to acquire these slums and to lay out model quarters for the housing of the poor.

Nine Maternity and Child Welfare Centres have been established in the city. *Daies* and women attending these centres are taught hygiene, proper methods of bringing up children, needle-work, etc. A Baby Week designed to stimulate popular education in child care has been held annually for the last few years.

In one branch of public health improvement the Municipality has failed, not because effort was wanting on its part but because the law was against it. I refer to the attempts made to rid the city of prostitutes. All efforts to eject them from the heart of the city, to declare certain areas prohibited for their residence and to segregate them have proved futile. Unless the law is altered as to the definition of a prostitute, efforts in this direction must be unavailing.

Though in certain parts of the city, dangerous and offensive trades still exist, some of them such as leather-drying, boiling blood and offal and others from which noxious smells or smoke arise, have been removed to the outskirts of the city, thus rendering the atmosphere of the city less impure.

Water-Supply.

The water-supply of Delhi has long been one of the difficulties of the city. It was a problem half a century ago and is one today. The scarcity of water-supply and the inadequacy of the existing mains were felt for many years but it is only recently that serious attempts have been made to improve distribution. From 1923, hours of supply of water have been increased from ten to fifteen. Mains have been extended to new areas and more than 200 drinking water hydrants have been erected. Supplies to parts of Sadar and Paharganj have been separately provided to conserve the water-supply within the walled city, with the result that although the number of water connections has more than doubled—in 1931 the number of private water connections was 11,500 as against 5,000 in 1921—water troubles of the Municipality have in fact been appreciably reduced. A comprehensive scheme for the re-organisation of water-supply to the city and suburbs at a cost of Rs. 20 lakhs of which half is borne by the Government of India, has been sanctioned. The scheme is under execution, large mains have been put in and it is expected that when water is turned on through these sometime this year, complaints of scarcity of water will be eliminated. Not all the inconveniences caused by the scarcity of water are due to the Municipality. Enormous waste occurs in public standposts and in private connections; and it is up to the public to prevent this wastage.

There is already a network of small pipes in the city, some of which will now be enlarged. New pipes will, in addition, be laid to serve localities which have no supply at present. Water mains and pipes passing through drains and sewers have been shifted in order to avoid the possibility of water being contaminated through pipes getting leaky.

Lighting.

As early as 1909 Delhi was the first city in the Punjab to secure a complete electrical installation. The improvement that has taken place in the lighting of the city is illustrated by the following table :—

| | <u>1921.</u> | <u>1931.</u> |
|---------------------------|--------------|--------------|
| Number of Kerosene Lamps | 2155 | 3689 |
| Number of Electric Lamps | 813 | 2548 |
| Cost of maintenance alone | Rs. 80,858 | Rs. 1,54,090 |

It is unnecessary to comment on these figures.

Fire Brigade.

Measures to deal with outbreaks of fire have long received the attention of the Municipality. Up to 1922 the Fire Brigade was manned by the police authorities. But the Fire Engine was antiquated, there were difficulties of water supply and the men of the brigade were far from being qualified in fire-fighting methods. The Brigade was taken over by the Municipality in 1922 and today the city has a Fire Brigade with an equipment which may be considered up to the standard. The staff has been considerably improved, up-to-date fire-fighting appliances have been purchased, policemen and firemen are carried to scenes of fire in buses, a water distribution gang is attached to the brigade and permanent quarters have been built for the staff. The figures that follow illustrate the progress :—

| STRENGTH. | 1921. | | 1931. |
|------------------------------|---|----------------|---|
| Head Constables | 2 | Superintendent | 1 |
| Foot Constables | 12 | Jamadars | 3 |
| Driver | 1 | Drivers | 7 |
| Fireman | 1 | Firemen | 34 |
| | | Stokers | 2 |
| | <hr style="width: 100%; border: 0.5px solid black;"/> | | <hr style="width: 100%; border: 0.5px solid black;"/> |
| | 16 | | 47 |
| EQUIPMENT. | | | |
| Steam Fire Engine | 1 | | 1 |
| Hand-drawn Valiant Engine | 1 | | Nil |
| Motor driven Fire Engines | Nil | | 2 |
| Trailer Motor Fire Engine | Nil | | 1 |
| Motor Water Wagons with Pump | Nil | | 2 (1000 gal. capacity). |
| Chemical Fire Engines | Nil | | 2 (34 gal. capacity). |
| COST. | Rs. 4,266 | | Rs. 77,189 |

An additional precaution that is now taken to fight fires immediately they break out, is the supply of portable chemical fire extinguishers in the different police stations. Safeguards have also been taken against fires by requiring that buildings

within the city walls and suburbs shall not be roofed with straw or other easily inflammable material.

Gardens.

The more important gardens under municipal management are the Queen's Gardens, the Roshanara Garden and the Daryaganj Purdah Garden. The Municipality is also responsible for arboriculture within the city limits, Subzimandi and Karol Bagh. A grant of Rs 18,000 is made by Government for the up-keep of these gardens. Their condition today is the best evidence of the care and attention which the Municipality has bestowed on them.

Education.

Of all the activities of a Municipality education is perhaps the most important and valuable, and the progress made by the city in this department is remarkable. Schools under the control of the Municipality are mostly primary schools, but there are also a few middle schools, lower middle schools, adult schools and an Industrial School in which carpentry, drawing, and smithy are taught. The last-named school, however, has now been taken over by Government. In 1913-14 the Municipality had under its management one Industrial School, one Anglo-Vernacular School, five lower primary schools and one primary school for Mahomedan girls, all of which involved an expenditure by the Municipality, by way of maintenance and grants-in-aid, of Rs. 33,857. In 1914-15 the expenditure rose to Rs. 38,580, that is, amounting to nearly three per cent of the income of the Municipality. The number of schools and pupils in the two years of comparison, 1921, and 1931, as well as the amount of money spent on them are :—

| BOYS | No. of Schools | 1921 | No. of Pupils | 1931 |
|----------------------------------|----------------|----------------|------------------------------|---------------|
| | | No. of Schools | | No. of Pupils |
| Industrial School | 1 | 160 | (Taken over by Government) | |
| M. B. Middle Schools | 2 | 327 | 2 | 551 |
| M. B. L. Middle „ | 2 | 368 | 2 | 712 |
| M. B. Primary „ | 16 | 935 | 47 | 8645 |
| | 21 | 1790 | 51 | 9908 |
| GIRLS | | | | |
| M. B. Middle and Primary Schools | 7 | 489 | 24 | 3224 |
| TOTAL EXPENDITURE | | Rs. 1,02,413 | | Rs. 3,91,795 |

It will be seen that as far as the increase in the number of schools and pupils and the figures of expenditure are concerned, there has been a steady advance. The efforts of the Committee in persuading the people and even compelling them to be educated explain this gratifying progress.

In recent years, Acts have been passed in most provinces authorising the introduction of compulsory primary education by local option. In Delhi compulsory free primary education was introduced in 1926. The city was divided into nine areas, in five of which it is in operation today. Of the boys who read in primary schools more than 50 per cent would have remained outside but for the operation of free compulsory primary education. Ninety per cent of the boys to whom compulsion would be applicable have come in and the average attendance is 80 per cent. When the scheme is applied to the whole of the city it is expected that provision will have to be made for about 18,000 boys. So far the Municipality has been able to provide for roughly two-thirds of the total number of pupils who ought to be in schools.

An appeal for the introduction of free compulsory primary education for girls was made by the Woman's Education League and while the Committee fully realise that "an illiterate female population cripples a nation by the comparative immobilisation of half of its intellectual resources" they have regretfully found that under present conditions it is not possible to give effect to the suggestion, for compulsory primary education even in the case of boys is still in the experimental stage and in the case of girls they feel that it cannot be justified till all efforts of persuasion have failed. Advance is not a little hindered by the difficulty of obtaining trained teachers, especially trained women teachers. There is a further difficulty in the case of Mahomedan girls of having to provide *dolis* to convey them between their homes and schools, which besides being an unsatisfactory arrangement adds considerably to the cost of educating them.

Due attention has been paid to the health of the pupils reading in municipal schools. It is recognised in western countries that medical inspection of children is really a part of public health work. In one of their circulars the Board of Education in the United Kingdom stated "Efficiency and

economy require an organic relationship between the daily work of the school authority and of the authority responsible for the administration of the wider branches of public healthConversely this organic relationship will provide increased opportunities and facilities for the medical officer of health to study all conditions affecting the health of the community at all age periods and will bring him into closer touch with the personal hygiene of the population." Medical inspection of school children is compulsory in England. How children are cared for by teachers can be judged from the fact that in some schools children who have a tendency to bronchitis are given one or two spoonfuls of cod liver oil malt every morning for six months. The annual report issued in 1926 by the Chief Medical Officer of the Board of Education in England, Sir George Newman, contains some interesting facts. It reveals that medical inspection of pupils had enabled defects and ailments, which otherwise might have involved a lifelong disability, to be eradicated, that mortality amongst school children from tuberculosis had fallen about 40 per cent and that, thanks to the medical inspection and timely treatment, much suffering in after life had been prevented. Sir George Newman made some recommendations among which were the following: that by suitable means a sufficient mid-day meal shall be secured for the child who cannot return home for it, that insanitary schools should at least be made sanitary and that the services of voluntary workers be enlisted to organise education in mother-craft, domestic economy and child nurture and management.

In Delhi a scheme of medical inspection of school children was sanctioned by the local administration in 1927 and is being worked. Two Sub-Assistant Surgeons have been deputed to do duty in the city schools and they are required to thoroughly examine each boy twice a year. For pupils found to be in need of medical treatment a slip giving the name of the disease from which the pupil is suffering is sent to his parent or guardian for information and action. The pupil is then entitled to treatment free of charge at any of the hospitals or dispensaries. Medical inspection of girls' schools is conducted by a wholetime lady doctor employed by the Municipality. Each school is visited three or four times a month and girls suffering from minor ailments are treated on the spot and in serious cases they are taken to hospitals.

Evening schools were started in 1924 for the instruction of adults. The number of adult scholars in 1927-28 was 841; in 1928-29 it rose to 1229; and the number has continued to rise each year.

The quality of the education imparted in municipal schools has also improved. More trained teachers have been employed and the inefficient one-teacher schools have been done away with by concentrating two or more of such schools in proximity to one another.

All Municipal schools with the exception of four are located in hired buildings and though complaints are not rare of overcrowding, ill-ventilation and ill-lighting, efforts have not been spared to reduce them to a minimum.

Under Education should also be mentioned the grants-in-aid which the Municipality gives to public libraries and reading rooms.

This account is intended to be an independent and impartial one, and for that reason I have been careful throughout this review not to over-draw the picture. I do not claim that the city is yet an ideal city. I know that the plague spots on its map have not disappeared. But those who have had the control of the Municipality have striven to make the city, within the limited means that were available to them, a better place to live in. Their task has been far from easy. They have had to contend against a number of reverses which have deprived the Municipality of part of the income which it formerly enjoyed, such as loss on account of the municipality not supplying water to the Notified Area Committee owing to the formation of the Joint Water Board, and the increase in the cost of distribution of water for the same reason, the disappearance of income from lands outside Ajmeri Gate and from the sale of manure, from the remission of the house tax in cases where the rent does not exceed Rs. 5, the responsibility to maintain the Fire Brigade and the loss of rent sustained by the occupation of firemen's quarters by the police etc. In the face of such handicaps, it will be realised how difficult must have been the task of accomplishing these improvements. Apparently no doubt there has been an increase of 50 per cent on the 1921 revenue; but it should be remembered that there has also been a

40 per cent increase in the population of the city. In 1921 the Municipality had a *per capita* revenue of Rs. 6.6; and in 1931 it was Rs. 7.4. During the ten years the Municipality has spent Rs. 22.7 lakhs on capital expenditure in addition to paying off Rs. 3,16,500 of debt. While most of the big cities in India are heavily indebted, Delhi to-day is unencumbered with debt. If the progress made by the Municipality is not perceptible from year to year, it will be evident at least from decade to decade. A comparison between it and the new city cannot, and in fairness, ought not to be made; nor can the old city be judged by the standards of the more fortunately circumstanced new city, for the one is a local city with limited resources while the other is an Imperial city with all the resources the Government of India can find for it. The real standard of judging the improvements that have been made is to compare the condition of the city in 1921 with that in 1931; and judged in this way, the last ten years administration of the city will, without doubt, be found to reflect credit on the Committee.

So much for the Delhi of to-day.

PART II.

"One of the largest difficulties in manufacturing—or in anything else—is to avoid self-satisfaction. If one does a job well, it is only human to sit back and look it over with satisfaction. In this sense success is the enemy. It is hard to regard a job that has been done as only a temporary stage from which to give one's attention at once to doing it better."

"There is a tendency to let well enough alone, and well enough never can be left alone. Nothing can remain static. Things are either moving forward or moving backward. If a management lets well enough alone for six months or a year, the business will inevitably get out of its control, little items of waste will creep in, bigger items will follow them, and in the end the costs will be so high that the profits will vanish."—Henry Ford in "Moving Forward."

I should like to preface my remarks in this part with a brief exhortation to my colleagues on the Municipal Committee. In the absence of any constructive policy before it, the Municipality has for sometime past been engaged in futile discussions and, what is perhaps more reprehensible, discussions characterised by a spirit of communalism. I have no wish to reprove the Committee for I cannot dissociate myself from them and I should be prepared to take my share of the blame or otherwise for their actions. We all have the welfare of the city at heart, or at any rate should have, and if I condemn the exhibition of strong communal feeling in the administration of the affairs of the city, I do no more than perform the duty of every well-intentioned councillor. A sense of civic responsibility should transcend communal bias, and, fortunately for Delhi, instances of the exhibition of such bias have been few and far between. It must be realised that the division of the Committee on communal and factious lines is not only fraught with danger to the city but to the members of the communities themselves. Communal wrangling tends to sap the discipline of the municipal staff and to undermine efficiency. If councillors have the welfare of their communities at heart, let their interest take the form of building schools or endowing scholarships, constructing dispensaries or providing beds in hospitals and such other beneficial forms. However undesirable denominational institutions may be, I would prefer that communal feeling takes this constructive form

rather than that it should take the negative one of voting at municipal meetings on communal lines and bringing municipal administration to a deadlock. The responsibilities of the Municipality are heavy and onerous and a Committee divided against itself has very little chance of successfully carrying them out. Our aim should be to set an example which would extend throughout the country, of harmonious co-operation between the different communities.

Perfect harmony and concord within the Committee as well as between them and the staff should be established. We have a duty towards the citizens for having elected us to the Committee and entrusted us with the administration of the affairs of the Municipality. We must therefore so conduct ourselves that when a reckoning is taken at the end of our term of office the public will have no reason to be disappointed with the choice of its councillors or with the work that has been done. Councillors should vie with one another in the interest they take in municipal affairs rather than try to rival others in breaking building byelaws and taking up the cause without justification of their undeserving co-religionists amongst the staff.

I now come to the second part of this survey which seeks to give an account of the further reforms that are necessary to make the city approach our ideal as near as possible. The primary object of a municipality should be to make the conditions of life under which its citizens live not only tolerable but pleasant. While the Municipality's endeavours in the last ten years to improve the city have been successful up to a limit they are not however complete. In the following pages I give a somewhat formidable, though by no means an exhaustive, list of the requirements of the citizens.

Public Health

Conservancy, Sanitation and Drainage.

To lavish money on costly schemes of water-supply, urgent as the necessity for purer water may be, on fine roads, gas lamps, commemoration halls and institutes, or on zoological gardens and parks, is but a mockery while the drainage of the sub-soil and surface water is neglected, the soil and foundations of the dwellings saturated

with filth, accumulations of excretal matter and organic filth abound and the air is laden with foul emanations. No human being can have health or enjoyment, no child can flourish or grow up to active youth and vigorous manhood in a tainted atmosphere."

"Good privies are far higher signs of civilisation than grand palaces or museums of art". R. C. Sterndale.

Certain schemes for the improvement of the city are already before the Municipality in the form of a five-years programme which consists of :—

1. Construction of drains in western extension.
2. Construction of drains in other outlying localities.
3. Improvement of drains in Delhi city and proper sanitary arrangements for disposal of refuse and nightsoil.
4. Water-supply in Karol Bagh.
5. Improvement in Delhi City water mains.
6. Acquisition and development of slum areas in the neighbourhood of Sadar Bazar.
7. Acquisition and development of Gali Shahtara slum areas.
8. Acquisition of land to the north of Shidipura and construction of model dwellings thereon.
9. Opening of branch dispensaries.

But as is pointed out by the Royal Commission on Labour in India, the proper treatment of problems of public health demands a considered and full programme as the attempt to deal with them piecemeal too often involves the frittering away of financial resources. The five-year programme merely touches the fringe of the problem of city improvement and there are other needs as urgent and vital which have to be provided for.

Sanitation in Delhi is still in its infancy and the improvements mentioned in the foregoing pages have not appreciably decreased the toll which epidemics levy from the city. A comparison with other cities as regards ratio of death per mille is given below :—

Deaths—Ratio per Mille.

| | Population (1921 Census) | 1919 | 1928 |
|------------------|------------------------------------|-------------|-------------|
| Bombay | 1,175,914 | 70.53 | 23.59 |
| Calcutta | 1,077,264 | 42.20 | 31.70 |
| Rangoon | 335,491 | 53.03 | 33.83 |
| Delhi | 248,302 | 46.40 | 34.56 |
| Lahore | 257,295 | 34.03 | 29.15 |
| Lucknow | 217,167 | 41.66 | 45.65 |
| Benares | 195,373 | 60.45 | 55.98 |
| Cawnpore | 195,085 | 63.60 | 45.48 |
| Allahabad | 145,605 | 40.48 | 31.31 |
| Agra | 163,750 | 45.93 | 41.34 |

While mortality in the cities is so heavy, it is remarkably low in comparison in every Notified Area or Civil Lines adjoining them.

Coming back to Delhi, removal of all refuse in as inoffensive and expeditious a manner as possible should be one of the first concerns of the municipality. Where the dry system cannot be dispensed with, the provision of pail shoots through which nightsoil from houses could be quickly disposed of instead of being stacked at *dalaos*, is a problem requiring immediate attention. In view of the improvement in public health which would result, the change over to the flush system of cleansing private privies will be a welcome step. There will be, as a consequence of the adoption of this system, an economy in the use of water for flushing drains; but a bigger supply of water will be required for the flushing of privies. At a time when the cry of scarcity of water in the city still persists, it would not do to employ much of the city's water-supply for this purpose, but the source from which to meet the additional requirements of water may be found in the hundreds of wells which still exist in all parts of the city. Electric-driven motor pumps may be installed in these wells and a few mistries engaged to go round and see to their working in small localised areas. Enough water could by these means be raised to meet the requirements. There will also be the further advantage of conserving the filtered water-supply of the city for more urgent needs. The cost of laying pipe lines is not expected to be heavy, for long pipe lines would not be required since the auxiliary supply would only be local and small lengths

would serve the purpose.

Some of the drains in the city have been found to have leaky joints and to have no proper beds with the result that they have sagged at places and the drain water has been contaminating the sub-soil. The sooner they are done away with, the better it would be. The cost necessary to maintain the present drains in good condition is an additional reason for abandoning them and adopting the flush system. The system of underground drains is already in use, to go no farther, in the areas under the Notified Area Committee and the New Delhi Municipal Committee; and in the interests of public health, if not in imitation of our neighbours, we should not lag behind.

Construction of more water-borne latrines, especially in the poorer quarters and of water-flushed urinals, should also be part of the scheme of improvement.

The Municipal officers estimate that the introduction of the water carriage system throughout the city will cost Rs 25 to 30 lakhs. As a result of the adoption of this system there will be the following net saving:

| Extra expense | Due to | Saving under various heads | Items of Saving | Net saving |
|---|---|----------------------------|---|-------------|
| Conservancy cart system Rs. 36,996 | Sewer gangs, Trap sewers, Absence of income from sale of manure, Special Drain Implements. | Rs 90716 | Dispensing with Drain scavengers, Bhisties, carts, and lorries, a few Jamadars etc. | Rs. 53,720 |
| Mechanical Transport system Rs. 36,996 | | Rs, 1,37,820 | | Rs 1,00,824 |

A half grant should be obtained from government if possible, or if not, the whole of the capital cost of the improvement will have to be borrowed. With a saving under the new system of about Re. 1 lakh, it should not be difficult to pay off the debt in the course of thirty years. Even if we take the capital cost to be 30 lakhs, an additional provision of 1,17,947 per annum will pay off both capital and interest charges thereon in 30 years. It should be remembered that all the money will not be required at once as the completion may take as long as five years

Prevention and Control of Epidemics.

"The economic loss involved in the birth and rearing up of great numbers of children who do not live to make any return to the community, in the sickness and disease which debilitate a large portion of the workers and in early death and the consequent reduction of earning years, is incalculable. Even a small step in the prevention of these ills would have an appreciable effect in increasing the wealth of India".—Royal Commission on Labour in India.

To rid the city of certain endemic diseases such as typhoid, malaria and tuberculosis, preventive measures have got to be found by the Municipality. In spite of the shifting at 450 places of water mains and pipes passing through sewers or through polluted sub-soil where contamination was visible and easily detected, high mortality from epidemics still continues.

Until recently, Delhi was comparatively free from devastating epidemics of all sorts. But in spite of the improvement in the quality of water, and in spite of the re-chlorination that is carried on in certain seasons in some parts, typhoid still prevails and cases have even occurred in the Notified Area. So chronic has the epidemic become—the registered numbers of deaths from this disease in the years 1928, 1929 and 1930 being 366, 529, and 266 respectively,—that an immediate and thorough investigation and suitable remedial measures are imperative.

As regards Malaria, the position of the city and the nature of its environs are no doubt favourable factors for its presence in an epidemic form. Anti-malarial work should take the form of levelling up of the ditches and unused canals in the city, the reclamation of the Bela swamp and the filling up of the existing quarry-holes and other pits in and around the city.

Prophylactic measures against tuberculosis consist of, to quote that eminent tuberculosis specialist, Dr. Muthu, "giving attention to town sanitation, the organisation of conservancy, the provision of pure water and clean milk supply, the replanning of old cities, the opening up of congested areas, the provision of open-air spaces, parks and public gardens, and open air schools for children, teaching of hygiene in schools and the control of the building of new houses to provide free access of light and fresh air".

The causes for the wide prevalence of tuberculosis in Indian cities have been attributed to sanitary, social and economic conditions. Of the sanitary factors that conduce to the spread of this disease, the more important are the congestion of the population, a low standard of conservancy and the impure water and food supply. With the predisposing social factor such as purdah, and economic factor such as the low vitality of the people caused by defective nutrition, the Municipality is not concerned, unless it be, in the one case, by breaking the age-long custom by means of compulsory education, and in the other, by the provision of pure food and water and healthy conditions of life in the city.

In recent years every progressive country has attempted to check the spread of tuberculosis. In England two Acts have been passed for the treatment and eradication of this disease, the National Insurance Act, 1911, which includes the provision of a sanatorium benefit for insured persons, and the Tuberculosis Act of 1921 which enables the local authorities to provide approved schemes for the treatment of all persons suffering from any form of tuberculosis and, in case of their failure, empowers the Ministry of Health to deal with the matter, debiting the cost to the local authorities concerned.

The urgency of the problem in Delhi will be apparent on a study of the figures of mortality from this disease during the last four years :—

| Year | 1927 | 1928 | 1929 | 1930 |
|---------------|------|------|------|------|
| No. of deaths | 624 | 759 | 889 | 1241 |

Sanitary improvements in general, more open spaces and a larger provision of medical relief will to some extent reduce the mortality from this disease.

Removal of Offensive Trades.

Under powers conferred by the Municipal Act, the Municipality can control and regulate dangerous and offensive trades by the grant or withholding of licenses. Licensing of these trades at present is largely a farce. Stricter control by a branch, adequately manned, of the Health Department, should be provided for.

The nominal fee charged at present does not enable the Municipality to employ an adequate staff as well as one which is above temptation from corruption. All licensing fees should be increased in order that the revenue obtained from them may contribute to some extent towards the maintenance of a special controlling staff.

Regulation and Control over Food Products.

"The output of work by the human machine is closely related to the quality of the food with which it is provided....Adulteration of Foods Act must be in force in every municipal area.....Without legislation for fixing of standards it is almost impossible to obtain a conviction for adulteration and severe penalties should be laid down for offences of this nature". Labour Commission.

Prevention of adulteration of food and food products is an important branch of the Health Department's activities. Bye-laws have been framed by the Municipality for preventing the sale of food unfit for human consumption and the adulteration of food products. Articles in respect of which such laws have been enacted are meat, bakeries, eating-houses, butter and *ghi* and milk. The purpose of these bye-laws is to control not only the quality of the articles sold but also of the conditions under which they are prepared. That people will buy cheap articles without regard to quality is a fact; but that is all the more reason why the Municipality should, for the sake of the health of the citizens, prevent people from poisoning themselves with impure and adulterated food. The advantage that will ensue from a strict enforcement of these bye-laws cannot be exaggerated. But the question arises whether these rules are being enforced. I have seen instances, by no means isolated, of food prepared and sold under conditions which are insanitary to a degree and which are an insult to the civic conscience, if there is one such, of the citizens. As recommended by the Royal Commission on Labour, the enactment of an Adulteration of Foods Act and the provision of effective means to enforce its observance will be necessary if practical good is the object aimed at instead of only the keeping of well-intentioned but unenforced laws on the Municipal Statute Book. The extension of the Punjab Pure Foods Act, 1929, to Delhi has already been recommended by the Committee and it is hoped that it will come into operation at an early date.

For licensing the preparation and sale of food products, a suitable fee should be charged.

Milk Supply.

A part at least of the infantile mortality in the city can with reason be attributed to the impure milk supply. In these days of quick and cheap means of mechanical transport it should be practicable for the Municipality to have a few dairy farms at places beyond the city where sanitary conditions prevail and wherefrom milk could be brought to the city in lorries and distributed to the citizens. Alternatively, the municipality should encourage private enterprise in starting dairy farms by guaranteeing purchases.

The Nestle's Milk organisation, which is the largest manufacturer of condensed milk in Europe, gets its supply of milk from dairies situated all over Switzerland by means of motor lorries and the railway. Utmost care is taken to maintain the highest standard of quality in milk. Periodical examination of cows by veterinary doctors, transport of milk in specially designed wagons and lorries, and distribution in sterilised cans are a few of the means it employs to ensure a high standard of quality in its products.

The town of Sheffield has, since 1928, municipalised its milk supply as a service connected with the health of the city.

The average rate of infant mortality in the city during the last ten years works out at nearly 222 per mille, a rate which perhaps is not recorded by many other cities ; and a better milk supply would in some degree mitigate this appalling death-rate. The efforts that Bombay has made in reducing her infant mortality from 666.7 per mille in 1921 to 296.3 in 1930 or a reduction by 56 per cent. must be an object lesson to Delhi Municipality, whose improvement in the rate of death during the same period is only to the extent of 14 per cent.

Slaughter-Houses.

As, owing to the increase in population, the inhabited areas have extended too near the slaughter-house and since

it blocks to some extent the city extension towards the west it should be removed from its present site in order to permit of the site being utilised for purposes of city extension as well as for the segregation of offensive trades in the outskirts of the city. Three slaughter-houses should be erected, one each at Karol Bagh, Bela and Subzimandi to enable better and quicker distribution and to save the enormous rush and consequent loss of municipal revenue at the present slaughter-house.

The Municipality is now deprived of its legitimate dues on account of the great rush that occurs in the slaughter-house and of the difficulty of proper checking. The provision of three slaughter-houses as suggested will not only ensure quicker and better distribution of meat in the city but will also enable the Municipality to obtain its full revenue from this source, which will soon repay the initial cost of building them.

Removal of Trades causing Congestion of Traffic.

The wholesale trades in heavy building materials and in wood and fuel now located in and around the Ajmeri Gate, Chaori Bazar, and Lalkuan should be removed from their present site. For the wood trade Subzimandi Railway Station where wood is received would appear to be the most suitable place. Its removal is also rendered necessary on account of its being an unsightly feature on the link road between the city and New Delhi. The iron and stone trades in Lal Kuan and Chaori Bazar could be located outside Ajmeri Gate in order to relieve congestion and eliminate traffic blocks which are a very frequent feature of this locality. It will be apposite to quote in this connection, Mr. J. N. G. Johnson who rightly said; "Lal Kuan, Chaori Bazar and Chitli Qabar suffer dreadfully from this wholesale trade in heavy building materials which block the streets both when being carted and unloaded. We must drive these wholesale dealers outside the city and locate them in proximity to a railway siding e. g. away off somewhere outside the Ajmeri Gate".

Hospitals and Dispensaries.

Provision for the care of the sick is at present not quite adequate. The projected Irwin Hospital was due to a realisation of this fact by Government. The number of patients treated

in the hospitals has increased out of proportion to the growth in population, indicating the greater prevalence of sickness at present than was the case ten years ago, and emphasising the need for the opening of more dispensaries. While Delhi with a population of 3,47,592 has only 333 beds, Bombay with a population of 11,57,851 has 2,158 beds or in the former case 9 beds per 10,000 of population and in the latter 19 beds for the same number of persons.

Economy in medical expenditure may be secured by the employment of honorary surgeons and by the encouragement of indigenous systems of medicine on a larger scale. In the west and even in some cities in India, there is a system of honorary doctors who do duty in the hospitals on certain specified days of the week. The employment of a number of them will result in reducing the cost of maintenance of these hospitals as well as inducing greater confidence in the minds of patients. It is only fair that doctors who have thrived in the profession and have made their fortunes in the city should be public spirited enough to do something in return by way of offering their services in an honorary capacity. The following news item from the "Times of India" of a recent date may be of interest: "It is understood that the Surgeon-General with the Government of Madras has formulated a proposal to have the Royapetta Hospital in Madras City manned entirely by honorary medical men with the exception of the Superintendent and one or two Assistant Surgeons. This proposal is in connection with the extension of the scheme of employing honorary surgeons and physicians in government hospitals in the city".

Indigenous systems of treatment, besides being popular, are cheaper in cost, and therefore much greater use should be made of them in preference to allopathic system with a view to bringing the cost down. The following figures will confirm this conclusion :—

| 1930-31. | | | |
|--------------------------|------------------------|----------------------|----------------|
| | No. of Patients. | Cost. | Cost per head. |
| Allopathic. | 1,035,140. (Rent free) | Rs. 1,85,574 | |
| | | less cost of dieting | Rs. 0 2 7 |
| Ayurvedic and Unani. | 456,148. | Rs. 28,772. | „ 0 1 0 |
| The cost in Unani is | | | 125 pies |
| The cost in Ayurvedic is | | | 104 „ |

Fees for medical treatment. Though municipal hospitals and dispensaries have at present a schedule of charges according to which they are supposed to require payment from patients for treatment, it may be doubted if strict adherence to the rules is enforced by the hospital authorities. If the municipality expects a fair return for the expenditure it incurs on the hospitals, it should lay down definite rules in this behalf. Most of the patients treated, even now pay their dues but they go into the pockets of the doctors. It is only proper that the Municipality should get the fees as it manages the hospitals and as any income from this source will enable it to do greater public good.

As the Civil Hospital in Delhi meets the needs of the sick in New Delhi, the Notified Area and the country lying within a certain distance around, contributions towards its maintenance should be obtained from these local authorities and from the neighbouring provincial governments. Though the Government could not find Rs. 50 lakhs to build the Irwin Hospital, there is no reason why they should not give us liberal grants for running our hospitals.

More accommodation should be provided by the Municipality for paying patients. A patients' ward may be built on the southern side of the Civil Hospital which may assist in avoiding congestion. It may also be found profitable to construct a block of rooms 30 ft. deep, with colonnades on the road side to the west of the Civil Hospital. The rooms on the ground floor may be let to shops which in view of the importance of the locality would be willing to pay fancy rents. The top floors would serve for wards for paying patients. The provision of a lift in this block of buildings would eliminate any inconvenience to the hospital staff or to the patients.

At present receipts from the X-ray department do not form part of municipal income. There is no reason why after paying a moderate remuneration to the doctor in charge, the balance should not go to municipal funds.

Infectious Diseases Hospital.

The present Infectious Diseases Hospital is a very poor apology for what such a hospital should be like. It is time that

the Municipality constructed an up-to-date one, on a scale to meet present-day requirements. The Municipality no doubt realises the necessity for a bigger and better hospital as will be apparent from the following extract from the address it presented to the Chief Commissioner in 1928: "You are doubtless aware, Sir, that our city with a population of 3,00,000 souls has no suitable hospital for the treatment of Infectious Diseases, incurables and consumptives." But after having taken notice of the fact and drawn the attention of the local Government, the Municipality has been sitting complacently, as if all that was required of it had been done.

Two estimates have been prepared for an Infectious Diseases Hospital of 158 beds, one by the Chief Engineer according to whom the cost of the building will be Rs. 6,05,828 and the other by the Municipal Engineer, who estimates it at Rs. 3,78,250. The Municipality has managed so far to give its contracts for buildings at 25 per cent below estimated rates. Even taking the higher figure of the Chief Engineer's estimate, in view of the great decline in prices and in view of the Municipality being in a position to place its contracts at rates lower than those estimated by the P. W. D., the capital expenditure on account of this hospital should not exceed Rs. 4 lakhs. I suggest that funds be raised by means of conducting sweepstakes. Many public institutions have been financed in this manner and the recent Dublin Hospitals sweepstakes are an instance. A few days ago a news item in the papers mentioned that the New South Wales State lottery for the benefit of hospitals had met with an unprecedented response. The Egyptian Government contemplates running a gigantic lottery to finance its hospital schemes. The Government finds it impossible to provide the money for the completion of the buildings within a short time and has hit on the scheme of raising the money by means of a lottery run under state control and the proposal is now receiving the serious consideration of government. I expect we in Delhi will be able to raise not less than Rs. 10 lakhs from this source. The balance left over after financing the capital expenditure may be invested in government securities for meeting running expenses. Though the New Delhi Municipal Committee has signified its willingness to consider sympathetically the question of a grant towards the

construction of the hospital, I hold the view that the Municipality should, in order to have a free hand in the administration and management of this hospital, not ask for or accept any contribution towards capital expenditure. Grants towards running expenses should however be required from neighbouring administrations which have occasion to make use of the hospital for the treatment of their citizens. A suitable site a little removed from the site selected between the Idgah and Jandhewalan will have to be found for the new and enlarged hospital as the site near Idgah will at no distant date be surrounded by houses.

Nursing Home.

The institution of a Nursing Home for the city is now overdue. Every city, even the smallest in the West, and not a few in India have Nursing Homes. Patients, some of whom cannot afford to pay a large fee to have nurses attend on them in their houses, would find it within their means to meet the charges of a Nursing Home. There will also be others whose treatment in their houses is not advisable owing to insanitary accommodation or surroundings and lack of proper attention regarding diet etc., who would be better cared for in a Nursing Home. The provision of a Nursing Home will set free a few additional beds in our hospitals for the treatment of the poor. A Nursing Home also provides a training ground for nurses, the demand for whom has only been very inadequately met so far.

This may at first be started on a moderate scale in a hired building somewhere in the Civil Lines. It should not be difficult to so manage it as to pay its own way after a year or two of its inception. The initial and recurring expenditure of a Nursing Home containing 20 beds for males is estimated by Dr. Sethna to cost only Rs. 4,540 and Rs. 1,736 per month respectively, after providing for a building rent of Rs. 300 a month (*Vide* Appendix).

Maternity and Child Welfare Centres.

"The figures we have been able to obtain for infant mortality" says the Labour Commission "indicate only too clearly the necessity for a wide expansion of maternity relief and child welfare

organisations". To bring about this expansion the Municipality should appoint well-qualified women medical officers to organise and run the centres and do propaganda work in teaching principles of hygiene and developing popular education in child care. In England the Midwives Act of 1902 and the Maternity and Child Welfare Act of 1918 take steps to secure the supervision of pregnancy, the supervision of midwifery, the establishment of maternity homes, health visiting and nursing and of infant welfare centres. Other European countries have a number of institutions for the welfare of mothers and babies, which provide for means of getting into touch with all expectant mothers, to keep them under observation and treatment, and to instruct mothers in the methods of bringing up infants. The establishment of a few maternity or lying-in hospitals or at least the provision of enough beds for maternity cases in existing hospitals, popularising child welfare centres and making available for the public the services of well-trained midwives are the requirements of the city. A comparative statement showing the number of maternity beds in relation to the population in Bombay and Delhi is appended below :—

| Name of city | No. of Maternity beds | Population. |
|--------------|---|-------------|
| Bombay. | 855 | 11,57,851. |
| Delhi. | 12 But in some cases private wards are requisitioned. | 8,47,592. |

The figures are self-explanatory and need no comment.

The advance from the extension of maternity centres to the provision of maternity beds in them is an easy step. These Maternity and Child Welfare centres could also be utilised for the propagation of birth control methods. The Ministry of Health in England permits advice on birth control being given at Child Welfare Centres. In the Native State of Mysore it is reported that four leading hospitals have been permitted to open birth-control clinics in which married women, whose health or economic condition requires it, may receive birth control advice. In Bombay advice on birth control is given in certain centres. In view of the fact that the growth in the population has outrun the city's capacity to accommodate it, it may be advisable to devise measures for the dissemination of birth control knowledge.

The average number of births in the city is 14,000 per year. Owing to the peculiar social conditions of the people, it is not expected that provision for maternity beds will have to be made for more than 50 per cent of this number. The number of beds at present available in the only women's hospital in Delhi is 12 as against 855 in Bombay. Last year 565 labour cases were conducted. Present requirements will be met by three maternity homes of 50 beds each. Allowing for ten days in the home for every patient, these homes will be able to deal with 450 maternity cases monthly or 5400 a year. The initial cost of a 50-bed unit is estimated at :—

Cost of land—Not estimated for, as we may safely expect to get it free from Government.

Cost of Building—Rs. 75,500
 Cost of equipment—Rs. 11,215
 Monthly recurring cost—Rs. 2,327.

Provided Government gives the sites for these maternity homes free and the Municipality agrees to run them, the whole of the initial cost or at any rate a substantial portion of it could be met from contributions of generous citizens. Part of the recurring expenditure will no doubt be covered by fees from paying patients. The Municipality and the Government should encourage donations being given, even when certain donors desire that out of their contributions a certain number of beds should be reserved for members of their own communities.

Every confinement case that is treated at these centres offers the best occasion for imparting instruction not only in the care of infants but in all other ways.

Education.

"Why should we use the word "education" to describe a course of study that fills a boy full of a lot of things that are useless while never teaching him to use his eyes or to think for himself?.....In the Edison School of Technology we are trying to stimulate boys to think for themselves by working out practical problems and doing practical work and their principal books will be the basic things—the materials and forces of nature and human society, the machines, appliances and tools that they see about them".—Henry Ford in "Moving Forward".

"The total expenditure on education of the London County Council for a population of 4½ millions is £12½ millions, of which 47 per cent is paid by the Board of Education, in the shape of grants out of taxes, about half from rates out of the general income of the London County Council, one per cent from fees and about 2 per cent from miscellaneous sources.....Out of this total expenditure 6.7 is spent on administration, 64.4 per cent on primary education and 10.9 per cent on secondary education. It is interesting to observe that out of a total population of 4½ millions, about one million people are under instruction".
Dr. Zia-ud-din Ahmed—Systems of Education.

"The only justification for education is that it fits a man for work—directly for the special work which he plans to do or indirectly by tempering and edging the tools of his intellectual equipment".
Henry Ford.

Compulsory free primary education for boys needs to be extended to the whole of the city. The provision of free and compulsory education for girls should not merely be regarded as the "distant peak to be one day attained" but should be introduced as soon as practicable. In the address presented to the Chief Commissioner in 1928, the Municipality stated:—"We have succeeded in extending free compulsory primary education for boys practically throughout the city.....During the short space of 2½ years we have been able to increase the number of girls' schools from 7 to 17 with a rise in the number of pupils from 581 to 1961." If increase in the number of schools and pupils were the only criteria, there is indisputable evidence of education having made a great advance. Unfortunately, however, it is not so simple a problem and there are factors more important than mere increase in numbers which influence the progress of education. Steps should be taken by means of efficient inspection and control to avoid what the Education Committee of the Indian Statutory Commission calls stagnation and wastage, stagnation, in so far as children for one reason or another do not advance from one class to a higher one and consequently stagnate, and wastage, in so far as children after a year or two of instruction give up school altogether. So far as Delhi is concerned this warning is of particular force. The following figures will illustrate clearly the wastage and stagnation that take place in municipal schools :—

| Year. | Class I | II | III | IV | V | VI | VII | VIII |
|------------|---------|------|------|-----|-----|-----|-----|------|
| March 1927 | 2426 | 789 | 474 | 406 | 113 | 78 | 36 | 33 |
| " 1928 | 4546 | 1412 | 863 | 524 | 98 | 99 | 43 | 33 |
| " 1929 | 4938 | 1579 | 883 | 663 | 193 | 119 | 40 | 35 |
| " 1930 | 5112 | 1880 | 1219 | 746 | 189 | 155 | 74 | 44 |
| " 1931 | 4467 | 1841 | 1459 | 932 | 155 | 159 | 76 | 49 |

So far the Municipality has aimed only at imparting literacy through its primary schools. According to the Education Committee, a standard course of instruction for a minimum period of four years is essential to secure a standard of literacy that will last. But a good citizen is one who is not only literate and can exercise his franchise intelligently but one who in addition has the training and ability to earn his own living instead of being a burden on city funds or dependent on the charity of citizens of means. Every man ought to have a trade of some kind, and this the Municipality should teach through vocational schools. Education should be given a technical bias. The imparting of vocational training to immature boys, to whom a suitable measure of general education has not been given, will be of little use. The aim of the Municipality should therefore be to supplement primary education by secondary and vocational instruction suitable to present-day needs. Polytechnics in Britain were established for the purpose of preparing the lower middle and the working classes for various industries and trades which require skilled labour. In our Municipality, compulsory free education would require to be continued up to middle school standard with vocational training in subjects like handicrafts, carpentry, smithy, leather-work, cabinet-making, pottery, hand-loom weaving, metal-work, cooking, lace-work, printing, book-binding, motor-driving and mechanism, painting, dyeing and tailoring. A few polytechnics should be established for giving instruction in these and other vocational subjects.

Reading Rooms to enable the citizens to read newspapers and periodicals should be opened in all municipal schools. By utilising school buildings as reading rooms after school hours, no additional expenditure for buildings or furniture will be incurred to achieve this object. The services of the school staff may be requisitioned on payment of a small extra remuneration to keep the buildings open for an hour or two in the evenings.

The Municipality might with advantage also undertake the publication of a catalogue of all books which are contained in the various libraries in the city.

A scheme of compulsory primary education that has no application to girls is bound to retard greatly the process of creating an intelligent and educated population. As in the case of boys, education for girls should extend over an equal period but with alterations in the courses of instruction. In their case the subjects taught should include cookery, dress-making, physiology, hygiene and sanitation, in fact such subjects as will fit them later in life to undertake the duties and responsibilities of wives and mothers.

An educationist trained in the methods of western education should be appointed by the Municipality. There are a number of ways in which improvement could be made such as in the organisation, equipment, curriculum, procedure and methods of teaching. So far there has been little control, and primary education has not made the progress it should have, in proportion to the expenditure the Municipality has incurred on that account, nor are municipal schools at present models to private institutions as they should be.

Most of the municipal schools are located in hired buildings which, from the fact that they were intended to be residential houses, are not quite suitable for the purpose of housing schools. In order that pupils attending schools may preserve their health and not be subject to diseases caused by ill-ventilation and ill-lighting, the Municipality should provide its own buildings designed specially for the schools.

Physical training should be an important item of education to both boys and girls. More playing-grounds should be provided for pupils, who should be encouraged, under the supervision of teachers to take an active interest in organised games. While attention is often directed to the establishment of more hospitals and dispensaries, very little care is taken to emphasise the educational and social importance of physical culture.

As has been said by one medical authority with the Board of Education in Britain, "No increased facilities for higher

education or technical instruction can in any way take the place of attention to the physical side of our children. The future of our nation will depend not on the ability of the few but on the fitness of the many and this fitness must be secured at all costs. It is for us as a nation a matter of life and death."

It may not be necessary to provide a separate building for each school but sessions may be so arranged as to teach two sets of pupils in one school building with one set of staff to whom a bonus may be paid. I presume school sessions extend only to 3 hours a day and if that is the case it would not be difficult to provide for one set having its classes from 7 to 10, and another from 10 to 1 or other suitable time. If this is done, not only would the 47 schools be accommodated in about 24 school buildings but a saving may also be made in the rents now paid for these hired buildings. The Municipality pays a rent of Rs. 53,650 every year for housing its schools. A building capable of seating 400 boys will cost, exclusive of land, Rs. 35,000. It will be possible in most cases to get land free from Government but where government lands are not available and sites for schools have to be purchased, this may be done out of the sale proceeds of municipal lands lying scattered in different parts of the city as for instance the superfluous land near the Subzimandi School. For a long time to come, on the assumption that our schools are thoroughly re-organised, 20 additional buildings may be found to satisfy our requirements, the total cost of which will amount to Rs. 7 lakhs. I suggest that the Municipality should take a loan of this Rs. 7 lakhs. A provision of Rs. 50,854 will liquidate the loan in the course of thirty years as well as meet the interest charges during its currency. Considering the enormous amount of rent that the Municipality pays for its boy's schools annually, namely, Rs. 38,000 for the year 1930-31, it would ultimately be of great advantage to it if it has its own school buildings.

In the address presented by the Municipality in 1928 to the Chief Commissioner, it said; "The help given to us from provincial funds is not adequate and we look to you for revising the grant-in-aid rules on a liberal scale." Education is not entirely a local responsibility; it is a semi-national one and

government should give more liberal grants for capital as well as recurring expenditure. It must be remembered that on account of the five-years programme of expenditure on education the government cannot reduce its grants to us.

The Education Department is one of the three which consume the highest percentage of municipal income. There can be no doubt that it is not managed as well as it should be, and that considerable economies as well as greater efficiency could be secured by stricter control and supervision. Though no uniform standard of expenditure per boy per month can be laid down, the cost of education varies greatly in the different schools and there are some variations which are hard to explain. For instance in Kucha Tarachand School the cost per boy is Rs. 2 whereas in Chaori Bazar which is a more important locality and where therefore rents are higher, the cost per boy is considerably less, in fact only Rs 0-15-0. The same is the case with girls' primary schools where the expenditure *per capita* varies from Rs 3-9-0 to Rs 1-12-0. Nor are middle schools free from this anomalous feature. The cost less rent per boy in Egerton Road school is Rs 3-6-0; in Subzimandi it is Rs 2-10-0.

The Municipality is not evidently a believer in Napoleon's saying that one bad general is better than two good ones and has got two Superintendents of Education with equal status and identical powers. It is to remedy these and such other defects that I have advocated the appointment of a well-qualified and energetic educationist, one endowed with imagination and missionary spirit, and to whom good work is its own reward. If these defects are remedied it will without doubt be possible for us to educate our children up to middle course at a total cost not exceeding Rs 6 lakhs, after a number of years. There will thus be an extra expenditure of only Rs 2 lakhs, half of which should be obtained from Government by way of grants and the other half or more may, as a last resort, be raised by means of an education cess, as is, I understand, levied by some local boards and municipalities in India. Bombay spent on primary education of her children Rs 30,68,580 in 1930-31. It should be the aim of the Municipality to make its schools models for private institutions to copy. Educational grants given by the Municipality at present amount to Rs 86,000 :

they certainly will not in future exceed Re. 1 lakh nor will they rise in proportion to the increase in our expenditure under the head, education.

It now remains to find a way of financing vocational education. The property of the Government High School is wakf for educational purposes. The educational and other, Government offices, should in fairness pay rent for the use of buildings on this land. A strip of land about 35' deep should be utilised for building shops at a height which will give suitable plinth from Lothian Road. Big rooms on the ground floor could suitably be used for instruction in vocational subjects. The locality is so important that it would not be difficult to find persons willing to construct the building, and let the Municipality have the free use of the ground-floor rooms in addition to paying it a small rent, which, however, should be earmarked for the special purpose of fostering vocational education.

Roads.

Much has yet to be done as regards means of communication in the city. The widening, for instance, of the Sadar Bridge between the Lahori Gate and the Qutab Road is necessary in view of the volume of traffic that passes through it. Roads in which there occurs great congestion of traffic at present should be widened, such as, the narrow necks between Khari Baoli and Chandni Chowk, Nicholson Road towards to Lothian Road, Egerton Road, the crossing near Maliwara which is almost always blocked, where, if need be, a few houses may be acquired, the Hauz Qazi turning which is congested on all sides, the narrow neck at Nayabaus, and the road from Hauz Qazi to Ajmeri Gate which is a very busy one and very often blocked, and whose footpaths should be reduced in width, particularly the one on the eastern side, preferably after acquiring a few protruding *chabutras*.

Amongst the various causes which are responsible for the heavy death-rate, the dust nuisance is also an important one. Any economy in not painting or paving roads, streets, lanes and bye-lanes is a very short-sighted one. This matter deserves the Committee's very urgent attention.

Widening of roads is a costly operation. Apart from the construction of a part of the roads, it involves the acquisition of a few houses and payment of compensation for them. For instance a few years ago, the operation of widening Chatta Jan Nissar by only a few feet was estimated to cost the Municipality Rs. 3 $\frac{1}{4}$ lakhs. Funds for this purpose will have to be raised by a tax on heavy-wheeled vehicles, motor cars and lorries and by an increase in the tax on cattle, horses, and dogs. These taxes are fully justified in view of the heavy expenditure the Municipality incurs every year by way of maintenance of roads. At present tolls are levied on vehicles, that is carts, entering the city, which are not registered here. On vehicles registered in the city there is a small license fee. The growth of vehicular traffic in recent years has been enormous and it is but fair that traffic which causes the damage should pay for the reconstruction of such damaged roads.

The income in 1931 from the tax on animals and vehicles shows a fall of 1.1% from the 1921 revenue and the percentage of cost in collection has gone up from 21.9 to 52.8 % in 1931. The staff employed for this purpose should be entrusted with the collection of the additional taxes suggested.

Provision of a Poor House.

In the address presented to the Chief Commissioner in 1928 the Municipality said: "The streets and roads of our city are at present infested with an army of beggars and mendicants, some of whom are suffering from disfiguring and incurable diseases. We believe that the time has now come when legislation should be undertaken to deal with these unfortunate people". Since then three years have passed without any advance having been made. "As a first step" the Municipality then solicited "help for the provision of suitable Poor Houses." The Chief Commissioner replied: "I find that the establishment of a Poor House was suggested by Col. Beadon some ten years ago and I understand that an experiment was made which did not altogether meet with success. You will perhaps reconsider the reasons which led to that result and acquaint me with the conclusions at which you arrive." There the matter rests, but it seems to me that there is also a legal difficulty to be faced. Neither the Government nor the

Municipality have powers to forcibly remove these importunate and loathsome beggars from the streets and confine them in a Poor House. The position will have to be examined at an early date and suitable action taken.

Funds for the construction and maintenance of a Poor House can best be found by a surcharge on income-tax. Considering the extent of the business that is conducted in the city, a substantial revenue may be obtained if the Municipality is allowed to levy this surcharge. In the memorandum of the Local Self-Government Department of the Government of Madras to the Taxation Enquiry Committee, to which I refer later in another connection, Government stated "The Governor in Council considers that the most satisfactory method.....would be for local bodies to levy a surcharge on income-tax." Under the Madras District Municipalities Act, 1920, municipal councils are authorised to levy a surcharge on income-tax with the sanction of the local government and of the Governor General in Council. We ask that a similar provision may be made for Delhi.

Lest I should not be understood correctly I must state that the Poor House which I have in mind is an infirmary for the aged and the infirm who have no means of support. Their maintenance is properly a charge on the younger generation and on persons of means. I have in my mind the making of a provision on the lines of the late Lord Oxford's Old Age Pensions Act of 1908 which made the receipt of an old age pension a citizen's right claimable by every person fulfilling certain statutory conditions, namely, that he must have attained the age of 70, that he is a British subject and that his yearly income does not exceed £ 31-10, and that he is not a person inclined to habitual idleness, to lunacy or one convicted for crime.

Decision of Municipal Cases.

Government should be requested to make provision for the expeditious decision of municipal cases, regarding the infringements of its different bye-laws, and cases of encroachment. The delays that occur in the hearing and disposal of these cases at present encourage evasion and involve a considerable loss to the Municipal Committee both in land and money, not to speak of

the nuisance on the footpaths of beggars and hawkers. At one time offences against the Municipality were disposed of summarily with deterrent punishment. Even a barber who threw litter on the road was fined heavily. But now serious offences take a long time to be decided and only nominal punishments are awarded. The attention of the District Magistrate has on several occasions been drawn to this feature.

Housing.

"The latter (Municipalities) are primarily responsible for the health of their citizens and that responsibility cannot be discharged in the industrial cities unless a vigorous attempt is made to improve housing. . . . Whilst this primary responsibility rests with municipal councils they are entitled to look for expert advice and stimulus from Government". Labour Commission.

Leaving aside for a moment the question of housing of industrial labourers, the Municipal Authorities should set an example by constructing model houses for their own staff. "Chawls" or tenement houses for the poor and the industrial labourers should be provided in order to relieve the congestion of population. The number of women per thousand males in Delhi in 1921 and 1931 is 672 and 674 respectively and this inequality in the proportion of the sexes, a contributory cause for which is the scarcity of houses, gives rise to prostitution and consequently to venereal diseases. Building of "chawls" is also a solution of the problem of opening up the slums.

Let me give an idea of how other countries are solving a similar problem. The Ministry of Health in the United Kingdom said in 1919; "It is the intention of the Government to keep the housing problem closely under review. They fully recognise the importance of that problem from the point of view of the health and social conditions of the people. . . . The Government recognise the urgent necessity of making what improvements are possible under the present financial circumstances. To this purpose, they are prepared to provide an annual contribution not exceeding £ 200,000 towards the deficiency on local authorities' account for the improvement of the slum areas. This annual contribution will continue for the whole term of such loan as may have to be

raised by local authorities". Two Acts were passed in that year, the House and Town-Planning Act and the Acquisition of Land Act Housing, (Additional Powers) Act, making it obligatory on every local authority to provide for the housing of the working classes within its area, providing a subsidy amounting to £15,000,000 in the aggregate to private persons building small houses, and compelling local authorities to issue 5½ % local bonds free of income-tax to holders of less than £500. In continental countries attempts have been made to meet housing shortage by means of clubs and co-operative building societies. In Germany Home Colonisation Associations were formed for the purpose of diverting urban population to rural settlement areas. In Delhi, there is great scope for private enterprise in the direction of providing housing accommodation. The *Bastis* in the old Kishan mills, Baghichi Sadanand and Baghichi Punjabi are standing examples of what has been and can be achieved in this direction by private enterprise under favourable conditions. In this connection Mr. J. N. G. Johnson once remarked rightly: "There is something to be said regarding a co-operative society"

Under the five-year scheme of sanitary improvements in the city, it has been planned to construct a few model dwellings to house those evicted from the slum areas. This project can only cover a small portion of the requirements and it would therefore be necessary for the Municipality to adopt a more comprehensive housing policy.

The housing schemes can only be financed out of borrowing. But my general impression based upon my experience as a Municipal Councillor is that the Municipality fights shy of raising capital by means of loans. Compared to other progressive cities, Delhi is free from debt. While Calcutta is indebted to the extent of Rs. 769 lakhs, Bombay of Rs. 1011 lakhs, Madras of Rs. 88 lakhs and Rangoon of Rs. 252 lakhs, the total indebtedness of Delhi was only Rs. 19.65 lakhs, the whole of which has now been discharged. This hesitancy to borrow is the reason why so many urgent schemes involving considerable capital expenditure have not been undertaken by the Municipality.

Certain assets have been left to us as a result of the prudence and careful management of previous Committees. The present

mittee will in turn leave to its successors a valuable heritage, for it has spent, in the last ten years, a sum of nearly Rs. 23 lakhs on capital expenditure in addition to paying off Rs. 3,16,500 on loans.

Other Public Amenities.

The provision of parks, playgrounds, theatres, museums, art-galleries, libraries, swimming baths, zoological gardens, clubs and other means of recreation and instruction, is one of the duties of every municipality. In a crowded city like Delhi, open spaces are a special necessity to enable the citizens to have a breath of fresh air. One means of inducing the public to spend an hour or two in the gardens is to provide broadcast music.

Wherever possible playgrounds, parks, libraries, swimming baths etc. should be provided out of the income from fairs and from places of amusement and out of contributions from citizens. There is no form in which philanthropically disposed citizens can turn their munificence to better account than by financing schemes which promote the happiness of their fellow-beings or which alleviate human sickness and misery. Every year the Municipality has to deal with a number of requests for permission to erect cattle-troughs *pias* from people who wish by these means to perpetuate their memory or that of some departed relative. If to such donors the promotion of human welfare seems more worthy objects of philanthropy, we should indeed have had a sufficiency of parks, playgrounds and libraries.

For swimming tanks, the municipality should find funds from revenue. One tank will cost about Rs. 10,000 and the maintenance charges are estimated at about Rs. 80 a month. By means of a system of admission by tickets, the running charges and possibly a fraction of the capital expenditure may easily be recouped.

In view of the heavy cost of providing parks, I suggest a further source of raising money for this purpose, namely, to ask Government to give us a strip of land about 75' wide in the Queen's gardens running along the whole northern boundary adjacent to Queen's Road and facing the Railway Station. The area would serve ideally for shops and hotels with residential accommodation etc. The Municipality will be able by selling

plots of this land to obtain a substantial income which should be ear-marked for expenditure in connection with providing parks wherever possible.

Creation of a Civic Conscience.

"The object of municipal institutions is not merely to get local work done efficiently but also to develop the civic spirit and raise the level of general intelligence amongst the people"—J. S. Mill.

"If the personal habits of a people are bad, municipal expenditure on sanitation is to a great extent wasted. If people are scrupulously clean and tidy in their habits, their homes and the surroundings of their homes will be clean and from that it is an easy step to a clean city".

The responsibilities of a citizen do not end with the payment of his rates and taxes but they extend to uniting and co-operating with the municipal authorities in the discharge of their functions. The apathy of the Indian citizen in civic matters is proverbial. He rarely likes his municipality; he feels he has to tolerate it. As Sir John Thompson once said: "The minds of the people must be educated in the practice of education and hygiene". A civic consciousness can be created by closer relationship between the councillors and the citizens, by forming Rate-payers' Associations, by the creation of a civic pride in the minds of the citizens to beautify the city instead of fouling it, by establishing free cinemas and theatres for public enlightenment on social hygiene and for amusement, by the publication of a Municipal Gazette as is done in Calcutta, by subsidising newspapers to publish articles on municipal administration and by the inclusion of civics in the curriculum of studies in municipal schools. A civic consciousness can also be created through the medium of advisory committees to co-operate with the various departments of the Municipality. For instance, Ward Health Committees or an Advisory Committee for Hospitals would be helpful in stimulating the interest of the public in the working and welfare of hospitals. The appointment of a few rate-payers as visitors would also assist in popularising the institutions.

Along with the further improvements which I state to be necessary, it behoves me also to suggest ways and means of financing them by pointing out new sources of revenue or

the possibility of augmentation in existing items of income, for the first necessity of municipal improvement, as that of all undertakings, is money. Delhi, or any Indian municipality for that matter, is not placed in the fortunate position which a few local administrations in Europe enjoy, that of being able to meet a substantial part of municipal charges out of municipal trading, such as gas works, tramways, electric supply, etc. One German town in particular is not only exempt from any local taxation but pays its citizens an annual dividend in cash after meeting all requirements and adding to a reserve fund. It may be years, if ever, before we can envisage such a state of things in Delhi. Unfortunately, the only city in the Punjab, namely, Amritsar, which ran its own power-station found it an unsatisfactory affair. Until such time then it would be necessary to meet municipal requirements by additional taxation.

The incidence of taxation per head of population in some of the chief cities in India is shown by the following table :

| City | Population | Rates & Taxes | Total income excluding extraordinary and debt. |
|---------------------|------------|---------------|--|
| Bombay | 1,175,914 | Rs 23 2 8 | Rs 26 13 8 |
| Calcutta | 1,077,264 | 17 7 9 | 21 7 3 |
| Madras | 528,791 | 7 8 2 | 10 5 5 |
| Rangoon | 395,491 | 26 6 1 | 29 9 10 |
| Lahore | 251,295 | 5 9 10 | 8 8 8 |
| Amritsar | 157,081 | 5 13 3 | 12 15 11 |
| Delhi | 248,302 | 5 12 7 | 9 10 5 |
| Delhi Notified Area | 17,308 | 4 7 8 | 28 0 0 |

(of which Rs 1 13 9 is contributed by the Delhi City Committee.)

With a taxation per head which is about one-fourth of what Bombay citizens pay and one-third of what Calcutta levies from her inhabitants, we in Delhi cannot reasonably expect the Municipality to provide all our requirements on its present slender resources. If, for instance, a department is required to undertake the stupendous responsibility of maintaining the health of the city with funds which work out at about a rupee per head per year, is it surprising that the department has not done all that is required of it? The performance of larger responsibilities by the departments involves the placing of adequate resources at

their disposal. It may be relevant in this connection to point out the sources of income of municipalities in other countries. According to a writer on public finance, in the United States, the percentage distribution of net revenue receipts of 146 municipalities was as follows :—

| | 1919 |
|--------------------------------|------|
| General Property Tax | 66.0 |
| License Taxes | 4.3 |
| Other Taxes | 3.4 |
| Earnings of Public Enterprises | 10.2 |
| Special Assessments | 5.6 |
| Subventions | 4.1 |
| Other sources | 6.4 |

In England the percentage of local revenue worked out as given below :—

| | |
|--------------------------------------|------|
| Rates | 43.0 |
| Water, Gas and Electric undertakings | 17.0 |
| Tramways and Electric Railways | 9.0 |
| Government contributions | 14.0 |
| Loans | 2.0 |
| Miscellaneous | 15.0 |

It will be seen that in these countries, unlike in Indian Municipalities, at any rate those in Northern India, a large part of the revenue was realised from direct taxes, and that municipal trading has been, again unlike in Indian municipalities, responsible for a considerable share of the income of the cities.

Municipal trading in western countries covers not only gas works, electric supply, tramways etc., but also includes municipal banking and insurance which, while encouraging habits of thrift among the population, enlarge the resources of local bodies. In England the Municipal Savings Bank (War Loan Investment) Act, 1916, authorises the establishment, under certain conditions, of municipal Savings Bank in municipal boroughs with a population exceeding 250,000. The municipality of Birmingham has, under this Act, established a Savings Bank which has proved to be a great success.

Revolutions in municipal finance cannot be effected in a day and we must therefore look to traditional sources of income

for any increase in revenue that we may require. I wish to suggest first certain sources from which increased income may be obtained for general purposes and then to indicate specific ways of raising funds for particular purposes.

Terminal Tax.—Too often it happens that the raising of additional revenues resembles what Mr. (now Sir) P. P. Ginwala described in the course of the Budget discussion in the Assembly in 1923. He said: "What takes place in the office of the Hon'ble the Finance Member every year when he prepares the budget I can well imagine. He sits in his chair. He has got three men generally with him. On his right is perhaps Mr. Cook; on his left Mr. Ayyar and in front of him Mr. Sim. Then he asks "How much do these people require?" They say, "Oh, this year they want 80 crores of rupees only from taxation". "Is that so?" "What did they have last year?" "64 crores". "Very well. give me a copy of the Tariff Act, a copy of the Income-tax Act, and a copy of the Opium and Salt Acts and a blue pencil". He takes the blue pencil in his hand and says, "Here 11% on this. No. I will put 15%. That will give us 2 crores. Is that not so? Mr. Cook." "Yes, approximately that". Mr. Sim then says, "Income-tax has been rather sterile these last few years. We will try a little super tax on something". And he adds on something to the super tax. Then he goes through the Opium and Salt Acts and the same process goes on until he thinks he has secured the additional sixteen crores." Methods of raising municipal income may not be very dissimilar to the above and the Terminal Tax Schedule offers as great a scope for indiscriminate increase in rates as for instance the schedules under the Tariff Act.

In levying terminal taxes according to a schedule great care has to be taken in its preparation to so adjust the burden of taxation as to exempt the poor or at any rate to tax them only lightly and those able to pay, according to their means. What is required is a schedule framed on a scientific basis, not a haphazard list adopted from other municipalities with but slight or no modifications. When such a schedule takes the place of the present one, while there will no doubt be found a number of articles which it may be possible to tax at a higher rate, there may also be some on which a reduction may

be desirable. Some years ago, the writer and Khan Sahib Abdulla went into the question of the revision of the Terminal Tax Schedule and they then arrived after a very careful examination at conclusions, most of which are set out below :—

Among articles of Food and Drink an increase in the rate for Cocogem, butter and cream and tallow and a tax on vegetables, fresh fruits and wines may yield an additional income of between Rs. 2 or 2½ lakhs.

Under the head Articles for Fuel, Lighting and Washing, an increase in the rate on grease, and the imposition of a small levy on kerosene oil will bring in an additional revenue estimated at between Rs. 35,000 and Rs. 40,000. A small tax on petrol alone is estimated to yield not less than Rs. 50,000.

In the classification 'Articles used in the construction of buildings' an increase in the rate for wood and on tiles etc. of all kinds will enrich municipal resources by the addition of Rs. 40,000 to Rs. 50,000

Of articles comprised in the group Drugs, Spices and Perfumes, all essentially luxury articles, and which may therefore well bear an increased tax, a raising of the rate on foreign medicines and syrups, on hair oil and spices may result in an increase in revenue of about Rs. 15,000.

Under the head "tobacco," an increase in the rate for all foreign tobacco, cigars and cheroots and on Indian tobacco, may yield an additional Rs. 18,000.

Under the head Metals and articles made of metals an increased rate on iron and steel, (unwrought and wrought bars, sheets, girders etc. used in construction), on hardware and cutlery, and on push cycles, motor cycles etc. will fetch about Rs. 20,000 to Rs. 25,000.

In the group Miscellaneous, a tax on bricks is estimated to yield about Rs. 35,000. A tax on building materials is justified on the ground of high rentals, which houses in cities, owing to the amenities provided by the Municipalities, earn. This tax is levied by other municipalities. Other articles which would bear

additional taxation are rubber goods, motor tyres and tubes, articles made of horn, celluloid or bone, paper and pasteboard, manufactured wood, earthenware, and stoneware. A light tax on all of them, or an increase in such as are already taxed, would bring in an additional income of between Rs. 40,000 and Rs. 50,000.

I must emphasise that in the increases suggested above care has been taken either to exclude altogether or only tax very lightly articles of consumption by the poor, to levy but a small extra tax on most other articles and to impose a comparatively heavier rate for luxury articles. A schedule framed in accordance with these suggestions will result in an increased income of between Rs. 4 and Rs. 5 lakhs.

Water Rate.—There are about 52,000 houses in the city paying house tax while the number of water connections is only about 11,000. There is no reason why the 11,000 connections should be made to pay for water supplied not only to all these houses as well as to those which are exempt from the house tax by reason of their rental valuation not exceeding Rs. 5 a year, but also for municipal needs such as road-watering. I suggest at least the doubling of the house tax on houses which have no connections and which take their water from public stand-posts within a certain distance. Exception should of course be made in the case of houses which do not now have to pay any house tax. The additional income must come upto Rs. 1,00,000 or more.

Tax on Advertisements.—Posters and placards on electric lamp-posts, tramway and telegraph posts, trees and walls may be made to yield an income. For the determination of the exact yield of this tax no data exists and though it is bound to be only very small at first it is possible that it may become a potential source of appreciable income.

Tax on Entertainments.—As in Bombay and Calcutta, a tax should be levied on tickets of admission to places of entertainment such as cinemas and theatres. This is a luxury tax and its collection offers no difficulty. A tax of one anna on the lower class tickets and of two annas on the higher class ones may be expected to yield about Rs. 36,500.

Income from Fairs.—A means of raising a considerable income is by the annual celebration of a Municipal Fair. It is well known that the people of Delhi are very fond of fairs. For certain reasons the holding of a very important Fair to which people from long distances used to come, the "Sair-i-Gulfaroshan," has been discontinued. The taste of the citizens for fairs could be exploited for the purpose of adding to municipal income by the holding of a municipal Fair every year in the Queen's Garden. The Fair may last for a week and if it is well organised and if numerous attractions such as exhibitions, scout displays, wrestling matches, cinemas, magic, shoots, merry-go-rounds, carnivals, restaurants, stage-plays by students of different educational institutions, laughing gallery etc. are provided, the gate money, stall fees etc. will bring in a sum of at least Rs. 50,000 a year in course of time. Of course a lot will depend on how it is advertised.

Nazul Lands. Nazul Lands are lands declared forfeit to Government after the Mutiny of 1857. They were entrusted to the Municipal Committee by the Punjab Government to be administered in accordance with the provisions made in that behalf; namely, that in the case of sales of Nazul lands the proceeds must be credited to provincial revenues and that income derived from leases are to be credited to the funds of the trustee committee. I remember to have seen a letter which Col. Beadon addressed in another connection to (the then) Hon'ble Mr. W. M. Hailey, Chief Commissioner, Delhi, in which he stated that if improvements are made at the expense of the Municipality, the local body should be permitted to recoup itself by the profits from sale or leases of the building sites, for, unless this were allowed, it would be impossible for the Municipality to undertake the management of these lands. He pointed out in that letter that when Government entrusted the Municipal Committee with the management of Nazul lands it did so for the specific purpose of advancing the prosperity of the city and that it was the intention that the lands should be so administered as to develop them on sound lines. He therefore urged that the sale proceeds of the plots sold may go into municipal coffers.

From 1874 up to 1925 these lands remained under the control of the Municipality which has managed and developed

them during all that time. For many years, in fact, until the Government of India moved to Delhi and an appreciation took place in the value of all properties, the annual income from these lands did not even suffice for expenses of management and development. When they had just begun to yield a return, Government resumed them. One argument for the resumption of these lands under Government control was that they were not well managed. The refutation of this charge would be found in the fact that though the lands were under municipal management, this management up to 1921 meant the virtual management by Government officials, since the President of the Municipality was the Deputy Commissioner, the Secretary an I. C. S. officer and the Committee largely official and not so democratic as it is now. Soon after 1921 the Municipal Committee formed a special Nazul Sub-Committee whose work cannot be too highly commended. The steady annual increase in the income from these Nazul lands from 1922 to 1926 is illustrated by the following figures:

| | | |
|---------|-------------|-------|
| 1922-23 | Rs. 35,764- | 0- 7 |
| 1923-24 | „ 56,395- | 11-10 |
| 1924-25 | „ 56,993- | 0- 1 |
| 1925-26 | „ 88,509- | 8- 7 |

The lands were resumed in 1925 and in the six years that have elapsed, they have not been much improved under Government control, for the income from these lands remains the same, nor is any progress visible in other directions. The last letter of the Secretary setting forth the arguments for these lands being transferred permanently to municipal management is a masterly exposition of the facts and I need make no apologies for quoting it here in full.

**“Copy of letter No. 3408-R., dated the 20th December 1929
from the Secretary, Municipal Committee, Delhi, to the
Deputy Commissioner, Delhi.**

“With reference to your Endorsement No. 1076/N., dated the 15th of November, 1929, I have the honour to forward for your information a copy of Resolution No. 3, dated the 4th of December 1929, and to request that the Chief Commissioner may kindly be asked to have the management of all Nazul lands retransferred

to the control of the Municipal Committee. In support of this request I am directed to urge the following reasons for your consideration.

1. The lands falling under the head "Nazul" are mostly lands declared forfeit to Government after the Mutiny of 1857. These lands rightfully belong to the inhabitants of Delhi as the customary heirs and lawful successors of the original owners of these lands and properties and as such should vest in the Municipal Committee—the statutory representative of the inhabitants of Delhi.
2. The furthest limit of Government's title to the custody and management of these properties could not go beyond "Trustee-ship" on behalf of the rightful successors, on whom all properties liable to escheat on failure of lawful and customary heirs should ordinarily devolve.
3. Such trustee-ship terminated when in recognition of the fact that the "Local District Staff" palpably mis-managed the said properties (*vide* para. 2 of Mr. Whitehead's report and the Chief Commissioner's letter No. 262, dated the 10th January 1925 to the Government of India) and all Nazul properties were made over to the Municipal Committee of Delhi in 1874.
4. The Municipal Committee took over the properties, developed and managed them in as good a manner as it was possible to do under the circumstances and the Hon'ble the Chief Commissioner recognised this fact in para. 17 of his note, dated the 9th of September 1924, on "Delhi Nazul Land."
5. From para. 36 of Mr. Whitehead's report it appears that in about 1910 the Municipal Committee's total income from these lands was about Rs. 1,100, while for over 30 years it continued to pay large sums from its ordinary revenues for the up-keep of Government Gardens. It was only after the transfer of the seat of the Imperial Government to Delhi that these lands

began to appreciate in value and give us a fair return for the past expense and labour. My Committee feels it a grievance that these lands should be taken away from it at a time when they had begun to give satisfactory results and held out great hopes for the future.

6. The management of these lands by the Government Nazul Department, during the last 4 years, has not fulfilled those high expectations which were once confidently entertained. The Committee's income from these lands, immediately prior to the taking over by Government, was about Rs. 60,000 a year with an expenditure of about Rs. 2,500. While the cost of collection has increased considerably since then, there has not been any appreciable increase in income. With the formation of a Nazul Sub-Committee, consisting of members in close touch with the civic life of the city, my Committee feels that it would be able to develop these lands more rapidly and profitably.
7. The Committee is primarily responsible for the sanitation, health, and welfare of the city and with the increasing congestion brought about by making Delhi the capital of India it holds that it should be allowed to manage the future expansion of the city.
8. The present-day policy of Government is to entrust Local Bodies with larger and larger powers and make them self-governing in the true sense of the word in all matters which lie within their sphere of work and the taking away of these lands from the management of my Committee is hardly in accordance with this declared policy. The Committee is thankful to Government for preparing a true record of such properties but having done this the Committee feels that these lands should be handed back to it for further developments. My Committee is prepared to give an undertaking that the income derived from these lands will be spent on their improvements.
9. The dual control at present exercised over Nazul lands and other Government estates is bound in the long run

to have disastrous results on the health of the residents. Building sites are being allotted without any proper arrangements being made for the necessary conveniences of life. The Government of India finds it difficult to allot funds on account of financial stringency and the Municipal Committee is reluctant to spend any large sums on Government estates.

If unfortunately the Government is not prepared to accede to the request of Committee, I am to ask that the proposal contained in my letter No. 3069, dated 14th of November may be favourably considered."

Share of land revenue collected by Government from vegetable and fruit farms in the vicinity of Delhi. The claim of the Municipality for a part of the land revenue rests on the ground that the city provides a ready and easily accessible market for the produce of these farms.

Tehbezari from outlying areas. This would be a small tax on vendors in outlying parts of the city who occupy pavements for the sale of their wares.

Sale of Manure and City Sweepings. The Municipality was till recently getting a fair amount of income from this source. The area lying outside Ajmer Gate where were located the municipal dumping grounds have been taken out of the possession of the municipality under a power of the local government either to invest the municipality with the control of outlying areas or to dispossess it of them. The exercise of this power of the local government especially when it affects a source of considerable municipal income would require to be modified.

The possibility of obtaining an income by the generation of power out of burning the city sweepings should be examined by the Municipality. I quote an extract which may be of interest in this connection. It is from a recent book by Henry Ford—"Moving Forward". "The power plant at the beginning

will have a capacity of 30,000 k. w. and will be unusual in that its principal fuel will be the refuse of London which for hundreds of years has been burning on the dumps near by. When on my visit to London I saw these burning dumps it occurred to me that they might as well burn to some purpose and that purpose could be the generating of steam. Hence we have devised plans to burn all of this refuse and our tests show that from 666 tons of refuse burned a day we get 210,000 pounds steam per hour."

The addition to the general revenues under the several heads, if the suggestions outlined in the previous pages are adopted, will amount to:-

| | Rs. | Between Rs. |
|---|----------------|----------------|
| Terminal Tax | 4,00,000 | 5,00,000 |
| Water-Rate | 1,00,000 | |
| Tax on Advertisements (Not determinable) | | |
| Tax on Entertainments | 36,500 | |
| Income from Nazul lands | 58,000 | |
| Loss recouped by full reimbursement of expenditure in connection with providing amenities in western extensions | 40,000 | |
| Share of land revenue from farms (not ascertainable) | | |
| Ground rent from Burn Bastion Road and western extension | 90,000 | |
| Municipal Fair Proceeds | 50,000 | |
| | <u>774,500</u> | <u>874,500</u> |

or say between 7¹/₂ and 9 lakhs.

There are certain other sources from which funds may be made available for general expenditure. The first and foremost is by means of stopping the leakage in the collection of taxes. I have no doubt that our terminal tax income would show an increase of at least Rs. 25,000 if the evasion of the slaughter-house fees

were prevented and of over Re. 1 lakh if the smuggling of sugar were rendered impossible.

Another way is to effect economy by means of stricter control over spending departments. A severe economy and a rigorous retrenchment of expenditure consistently with the maintenance of a proper standard of efficiency should be made. An instance of where economies are possible is in the purchase of stores for hospitals. In times of low prices such as at present it should be possible to effect a considerable saving. It may be significant to mention that while the public get their small supplies of milk milked in their presence at seven seers a rupee, the hospitals in Delhi until recently were getting theirs at Rs. 9-8-0 a maund.

Duplication of work in whatever degree it may exist at present will have to be put an end to. An instance of two sets of staff doing an almost identical work is that of the building jamadars and sanitary jamadars who are required to inspect and report on the erection of unauthorised buildings. Overlapping probably exists in other departments as well and wherever it does, efforts should be made to effect a saving by concentration.

Saving could also be made in electric current charges by the provision of half-watt lamps for street lighting.

I am confident that by these several economies, at least Rs. 50,000 could be saved, so that an additional revenue from all these sources amounting to Rs. 9 to 10 lakhs would be available. Even excluding contributions and payments which we expect from government, there would still be an excess of Rs. 7 to 8 lakhs over present income.

The several suggestions that I have made may perhaps have been a little diffuse and I therefore summarise them below: -

| Schemes | Capital expenditure. | How financed. |
|--|---|--|
| Water carriage system of conservancy. | Rs. 25 to 30 lakhs | <p>Borrowing</p> <p>The system results in a net saving of Rs. 1,00,824 in present expenditure. This saving to be ear-marked towards interest charges and additional provision for a sinking fund contribution to be made out of revenue to liquidate the debt in 30 years. The additional provision to be made will amount to Rs. 1,17,947 or thereabout.</p> |
| Licensing of offensive trades. | No capital expenditure involved but expenditure of supervising and controlling staff. | All-round increase in licensing fees. |
| Slaughter-houses. | Expenses of erecting three houses. | <p>Realization of full fees from slaughter-houses expected eventually to repay initial cost of erecting them.</p> <p>Saving in present expenditure by employing Honorary Surgeons and Physicians and by encouragement of indigenous systems of medicine.</p> <p>Increase in income from hospitals by rigorous application of rules regarding payment by patients of means.</p> <p>Contributions from neighbouring local administrations and provincial governments. Increased income by providing more accommodation for paying patients especially the construction of a ward on the southern side of the Civil Hospital as well as one on the western side.</p> <p>Making arrangements for a part of X-ray fees to go to the Municipality.</p> |
| Provision of Hospitals and Dispensaries. | | |
| Infectious Diseases Hospital. | <p>Cost of Building and non-recurring expenditure amounting to about Rs. 4 lakhs.</p> <p>Cost of maintenance.</p> | <p>By conducting sweep-stakes.</p> <p>The proceeds from sweepstakes expected not only to cover capital cost but leave a substantial balance which would be enough to pay for recurring expenses.</p> |

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| Nursing Home | Initial Expenditure Rs 4540 Monthly recurring expenditure Rs. 1736 | From Municipal funds Management so as to make the Home self-supporting |
| Maternity and Child Welfare Centres | Cost of land-Cost of Building Rs. 2,25,000 Running expenses | Building sites to be obtained free from Government. Donations and endowments from citizens. Municipal contributions and income from paying patients. |
| Education. School buildings. Schools | Cost of Building sites Cost of Buildings Rs. 7 lakhs. Extra expenditure involved by middle school and vocational instruction. About Rs. 2 lakhs. | Building sites to be obtained free from Government; if this be not possible, from proceeds of sale of municipal lands. By borrowing.—Repayment by setting apart an amount more or less equal to what is now paid as rent for hired school buildings. Securing economy in management. Half grant from Government Balance to be met out of general revenues and by the levy of an Education Cess. |
| Widening and paving of Roads and streets. | | Extra tax on heavy-wheeled vehicles, cars and lorries, on animals, and increase in licensing fees. |
| Poor House | | Surcharge on income-tax for construction and maintenance. |
| Housing schemes. | | Borrowing. Repayment over a long term of years by means of income obtained from charging an economic rent and if possible by a part contribution from municipal funds. |
| Public amenities. | | Endowments and donations from citizens. |
| Swimming baths. | Capital Cost Re. 10000 Maintenance Rs. 80 p. m. | Capital cost of swimming baths to be provided by Municipality. Recoupment from income obtained by a system of tickets. Other public amenities. Income derived under the scheme of converting a strip of land on the northern side of Queens Gardens to provide hotels and restaurants. |

While the Municipality's income would be increased by at least Rs. 7 lakhs, if my suggestions are accepted, the recurring expenditure to be met out of revenue would amount to only Rs. 4 lakhs and the balance may be utilised in case of deficiency in income under any of the schemes for which separate provision has been made.

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| Interest and capital expenses on drainge * | Rs. 1,17,947 |
| Nursing Home | 4,540 |
| Capital and Interestcharges on school buildings * (only the rent of buildings other than primary schools) | 20,000 |
| Swimming Bath, say, nil | |
| Education * | 2,00,000 |
| Maintenance of Maternity Homes (Making allowance for fees from paying patients) | 50,000 |
| | <u>3,92,487.</u> |

*It should not be forgotten that it will be years before the full amount will be required.

While we have reason to complain of the treatment of the Municipality by Government we fully realise that financial difficulties have not permitted them to give more attention to our needs. In recent years a welcome change was noticeable. We have to acknowledge with gratitude the help always readily extended to the city by Government in the shape of grants of land for purposes of education and medical relief. We could have had no greater well-wisher than the Hon'ble Sir John Thompson nor are we forgetful of the solicitous interest which Lord Irwin took in the welfare of the city. We have also to acknowledge the help rendered by the Rev. J. C. Chatterjee who by his presence in the Assembly has on several occasions drawn the attention of Government to the state of affairs in the city.

Unfortunately for us, it would appear that just at the time when we had more need of Government assistance, the more difficult have government finances become. Our request to Government would now be that in spite of their numerous pre-occupations they may take an abiding interest in the city and render it the help which it urgently needs in several ways.

PART III.

The Extension of the City.

The Problem Stated.—There is no municipal problem, be it of sanitation, medical relief or education so grave as the extension of the city. The recent census brings prominently to notice the serious congestion that exists. The city population has increased by 40 per cent on the previous census while the city area has not by any means been extended. Most of the ills from which the city has been ailing during the past decade—regular and chronic epidemics of malaria, tuberculosis and typhoid, isolated and sporadic outbreaks of plague and cholera, the growing infantile mortality and deaths amongst women before and after accouchement—can with reason be attributed to over-population. When population increases so enormously as in Delhi, existing municipal services prove woefully inadequate and epidemics break out as a consequence. Epidemics are Nature's warning of the existence of abnormal conditions of public health and its way of eliminating the surplus population. Palliatives, not remedies, sought earnestly to counteract the spread of epidemics are in the nature of endeavouring to lop the branches off while leaving the roots strong and firm as ever. And as long as measures are not taken to eradicate the deep-seated and material factors which render the breaking out of epidemics possible, so long will epidemics continue to ravage the city. If we have not suffered more than we actually have, it is due to the Health Officer and the Municipal Engineer, but for whose untiring efforts the ravages of epidemics would have been much more severe.

While the Notified Area Committee with a population of 17,000 is 7 sq. miles in extent, Delhi city accommodates a population of 3,47,592 in an area of 6.02 sq. miles. The congestion in the city today is such that it will sooner or later, sooner perhaps than later, lead to a state of things that can but bode ill to the health of the city. I am not an alarmist nor have I any desire to indulge in scare-mongering but I must emphasise that if no action is taken to relieve the congestion immediately, the consequences to the citizens may prove disastrous. If in a city which can people only about a hundred thousand, and that with difficulty,

a population of more than thrice that number is permitted to live, it cannot do so under normal, not to say, healthy conditions.

There is no need to labour on this point for it is a fact not disputed by any one. As early as 1914 the then Chief Commissioner the Hon'ble Mr. W. M. Hailey realised that the city was congested. He said, "Apart from the necessity for opening up building areas outside the present congested localities within the city walls, there are two special reasons which render the early development of this area (Burn Bastion Road) necessary." He further said, "Apart from Khari Baoli there is altogether no adequate space for sifting and clearing grain..... It is moreover impossible to utilise the pavements for foot passenger traffic." To realise how much more congested the city has become now, one has only to look at the latest census figures.

Let us consider how this situation has been brought about and on whom the responsibility for it lies. I regret to have to say that for the existence of this state of affairs, the Government of India is an accessory before and after. When it transferred its headquarters it should have known the demands that would be made upon the city by reason of the transfer, but it took no serious steps to enlarge the city in order to enable it to accommodate the increased population. After settling down at the new capital it should have known, indeed it had plenty of opportunities to know, that the state of congestion in the city was such as to require immediate handling; yet it has taken practically no action to relieve over-crowding.

The Municipality's Efforts.— It should be clearly understood that with the exception probably of taxing out cattle from within municipal limits and thereby setting a little more space free, the problem of providing an outlet for the congested population is not one in the hands of the Municipality. I cannot think of any other city which is in such an unenviable and helpless condition as the city of Delhi. It is hemmed in on all sides; in the North, by the Notified Area Committee; in the East, by the river; in the South, by New Delhi; and in the West, which is the only direction in which expansion is possible, the progress of the Western Extension is altogether disheartening. Neither have

the Government improved the extension so as to render it habitable, nor have they made it possible for the Municipality to go on with the scheme. The walls have been a distinct handicap to the city; they have not only effectively confined the city within definite limits but they have been taken as the natural boundaries of the city up to which neighbouring local administrations could extend their territory, which they have in fact done very promptly.

The question arises whether the Municipality has done anything to remove the congestion. Has it been merely quiescent, resigning itself to the situation as an inevitable evil, an 'act of God', or has it endeavoured to tackle the problem as best as it could? The only direction, as we have seen, in which extension is possible being beyond the city walls and the land there belonging to Government, no other course was open to the Municipality but to supplicate and entreat Government to make over the land to it, and this it has repeatedly done as the account in the following pages will show.

The Municipality first asked for the establishment of an Improvement Trust. It knew well enough that the proposal would necessitate the sacrifice of 2 per cent of its revenues year after year, but on a balancing of the interests affected and on a realisation of the extreme necessity of extending the city without delay it was led to make the proposal to Government in spite of the expense involved. The request however did not meet with the approval of Government.

Let me now give a brief history of the western extension scheme. The Municipality has spent a sum of Rs. 3,22,970 on the maintenance of the developed areas in western extension during the 4½ years ending March 1931. It has received from the Government development grants totalling in the period Rs. 1,12,500; thus while the Municipality has sustained a loss of Rs 2,10,470 in the development and maintenance of these areas Government have made an average profit amounting to Rs. 54,977 per annum.

The Government of India in a despatch to the Secretary of State in 1919 stated that the total area of the western exten-

sion was 1169 acres of which 126 acres belonged to Government, 647 acres were acquired at a cost of Rs 2,33,935 and 394 acres were acquired under the Municipal Act to be built according to lay-out. It said further that the administration of the area was proposed to be entrusted to the Municipality but that its finances would be kept entirely separate from ordinary municipal accounts. A later despatch in the same year, clearly stated that grants would be made to the Municipality which would carry out the scheme and that the receipts would be credited to the Municipality under a head separate from other municipal revenues. In letter No. 7578-Education dated the 31st August 1917 from the Personal Assistant to Chief Commissioner to the Deputy Commissioner, the Chief Commissioner recommended to the Government of India that all credits for rent and premia (if the latter were taken) should be made over to the Municipal Committee to the benefit of the separate fund which was proposed to be inaugurated for accounts relating to the western extension. This letter further stated that sums recovered by way of rents or premia and similar miscellaneous receipts derived from the land should also be credited to the separate account, though not, of course, ordinary municipal revenues such as house tax, terminal tax etc. The expenditure against the special grants was to be debited to the separate account. In his letter No. 4029 dated the 5th September 1917 to the Municipality, the Deputy Commissioner said: "The Revenue Assistant should take steps to recover the arrears and credit them to the Municipal funds". Another letter No. 16683 dated the 23rd December 1917 from the Chief Commissioner to the Deputy Commissioner stated "The receipts from the beginning of 1917-18 in which year the new arrangement under which the western extension was entrusted to the Municipal Committee came into force should go to the Delhi Municipality to be credited to the special western extension account". "The Municipal Committee", said the Government of India in a letter dated the 19th August 1918 addressed to the Chief Commissioner "should have authority subject to the sanction of the Deputy Commissioner to vary when necessary the rates of rents to be paid by the tenants".

Paragraph 2 of letter No. 3240 dated the 12th June 1924. from the Chief Commissioner to the Deputy Commissioner said "The original orders in regard to the financing of the western

extension were forwarded to you with the Chief Commissioner's Personal Assistant's endorsement No. 6255 dated the 10th July 1917. From this correspondence it is clear that after the date of sanction to the scheme all work in connection therewith was to be carried by the Municipality with funds supplied by Government and that a separate fund was to be opened by the Municipality for the purpose to which was to be credited not only government grants but also all income received by the Municipality on behalf of Government from that area as for example rents of government property and premia. From this fund works in the western extension were to be carried out by the Municipal Committee on behalf of Government". He asked in that letter for a complete statement of the accounts from the beginning up to 31st March 1924. The figures for the period showed that the income amounted to Rs. 1,46,445 while the expenditure was Rs 87,316. But it should be borne in mind that it was only from 1922 that lighting charges and road building were debited to this account and that till then these charges were met from the general funds of the Municipality. The Municipality further spent a sum of Rs 20,000 on account of sewage, which has not, according to a statement of Mr. T. Salkield, the then Municipal Engineer, been repaid.

The extracts are, I know, long and numerous but they seemed to me indispensable to show how Government have resiled from their former position. If the western extension has not developed as quickly as one would have wished, having in view the congestion in the city, the delay cannot be laid to the account of the Municipality for it has done the best it could under the circumstances; rather should it be to that of the government who have made a profit out of the scheme without spending it on the improvement of the area, let alone on further city improvement.

Let us take the Burn Bastion Road Scheme. It is a tale which is not dissimilar to that of the western extension. In letter No. 502/ C. dated the 16th August 1923 the Deputy Commissioner wrote to the Chief Commissioner that Government had spent on the Burn Bastion Road scheme Rs. 1,32,000 and had received from the sale of plots Rs. 5,31,200. He said "The ground rents amounting to Rs 11,674 are in the nature of land revenue and are credited to Government. The

amount is not a large sum but it would be an appreciable addition to the Municipal City Development Fund and it would be a highly appreciated act of grace if government were to assign these ground rents to the Municipality as a "mafi" or assignment of land revenue; the assignment being ear-marked for city improvement.

In 1916 a proposal for the formation of an Improvement Trust was sent up to the Government of India; but it was turned down by them in a letter No. 151 dated the 2nd October 1916 addressed to the Chief Commissioner on the ground that there was no need for the creation of an Improvement Trust, nazul land being mainly involved and Government ruled that local governments could alienate state lands up to the value of Rs. 25,000, disposing of them without reference to the Government of India.

In the written memorandum which the Local Self-Government Department of the Government of Madras submitted to the Taxation Enquiry Committee, they made the following statement: "If land value goes up as a result of the activities of the Municipal authority, they should have the power to tax the unearned increment. The tax on urban lands should go entirely to municipal revenues instead of partly to Government and partly to Councils as at present in this province". Mr. C. B. Cotterell, C. I. E., I. C. S., Secretary to the Government of Madras in the Local Self-Government Department was examined orally in connection with this memorandum and the following are the statements which he then made:—

Sir Percy Thompson: Q. Then it is stated "The tax on urban lands should go entirely to municipal revenues instead of partly to government and partly to Councils as at present in this province". Ground rent is what the Government charge for the use of Government land.

Mr. C. B. Cotterell: A. They pay every municipality a fixed amount which is a sort of stabilised revenue.

Q. It is for property actually belonging to Government?

A. Yes.

Q. They are owners of it?

A. Yes.

Q. Obviously they charge a rent.

A. They only retain what they would get from that land as agricultural land.

Q. But surely it is not a tax? It is a voluntary payment.

A. Yes, It is really the rent for the land. But the idea is that the value of the land is due to the presence of the Municipality—to the existence of the town. If there was no municipality the Government would only get their agricultural revenue and so they say "owing to the presence of the Municipality the value of the land is increased and we pay over the difference to the Municipality".

We can do no better than tell Government in the words of Col. Beadon that it would be a highly appreciated act of grace if Government were to assign the ground rents from the western extensions and Burn Bastion Road scheme to be earmarked for the purpose of city development.

I now pass on to the other municipal schemes of extension. The Committee adopted the following resolution in April 1927:

Resolved that (i) the Government be requested

- (a) to transfer the land from the Ajmeri Gate to Delhi Gate lying between the Circular Road and the city wall to municipal control;
- (b) to give necessary permission to dismantle the city wall between these two gates;
- (c) the Municipal Engineer be instructed to have an estimate with the necessary plans prepared of the lands to be acquired from private individuals according to the above scheme.

At a meeting held in December of the same year the Municipal Committee re-affirmed the resolution in the following terms:

"Resolved that after full and careful consideration the Committee unanimously re-affirms its opinion already expressed and holds that the extension of the city on the lines laid down is of vital importance to the health of the city. The Committee requests that if the Chief Commissioner still feels any doubt about the scheme he will kindly summon the President, the two Vice-Presidents and the Secretary, together with the Chief Medical Officer, to discuss the matter at a meeting with him so that this important subject may be dealt with as expeditiously as may be found possible.

In his covering note forwarding the resolution to the Chief Commissioner, Mr. J. N. G. Johnson, than whom no one knows Delhi better, said :

"I think it must be recognised from the first that if the proposal is accepted it may retard to some extent our development of the western extension area. Yet I am unwilling on that ground alone to oppose this scheme for expansion to the south, which in many respects seems eminently practicable and would get rid of the slums which are the worst blots on the city as it now stands. I cannot help feeling that it is in this direction that improvement could most speedily be wrought, and the policy was advocated by me in a note which I recorded in March last."

The Chief Engineer's objections to this scheme of extension were :

"On general grounds I am opposed to the demolition of the city wall which is a pleasing feature and a relic of the old city, and to the extension of the city without a break beyond its existing limits.

"I quite sympathise with the desire to clear out the slums on the south of the city but consider that it would be better to provide a lung such as is proposed in the city extension lay-out immediately to the south of the city wall and that the extension should take place on the other side of this lung.

"A further consideration which must not be overlooked is, that it has been decided (and I believe accepted by the Government of India) that a large General Hospital should be built on the site between the Circular Road and the Jail to the west of the Muttra Road. I have coloured on the plan an area of 83 acres which was the area required for the Hospital when it was designed for Block 205. In view of the fact that this area between the Circular Road and the Jail is so largely cut up by graveyards and other buildings which cannot be removed, it is probable that even more than 83 acres may be required for the Hospital.

"If the proposal of the Municipality were agreed to, the

city would extend right up to the Hospital from the Turkoman Gate to the Delhi Gate, which I consider most unsuitable. It might be possible to obtain an open space between the Circular Road and the Hospital, if the Jail is removed (a project which, I understand, is under contemplation) but the construction of the Hospital seems to me more likely to be taken up than the removal of the Jail. My own view is that the wall and the open space outside of it should be retained and that it would be better for Government to develop the city extension area with its own funds through the same agency as the new capital area is being developed by. This may be done in co-operation with the Delhi Municipal Committee in their schemes for opening up the slums to the south of Delhi, a subsidy if necessary being given to assist in the acquisition of slums. From the Government point of view this should not be more expensive than the present schemes, for as a matter of fact the present proposal of the Municipal Committee is a request for a subsidy in the shape of a present of the very valuable bit of land which Government has acquired for the purpose of development of the city extension area."

To these objections the Chief Medical Officer replied :--

"This is a scheme which has many points in its favour and the objections to it do not, in my opinion, outweigh the advantages. The various advantages have already been set forth and the question of control, finance etc. gone into, but I take this opportunity of adding a few remarks regarding the portion of the city wall under discussion and the disposal of the area between it and the Circular Road.

"The wall undoubtedly is picturesque as one approaches Delhi by the Delhi Gate but it possesses no historical interest, as pointed out in former notes and letters on the subject, and fulfils no useful purpose except to hide the dreadful slums of air and light. Moreover, to provide a park in the area outside the wall and retain the wall does not fulfil the anatomical requirements of a lung because the large passages by which fresh air

leaves the lung are missing and a partition wall as it exists at present is of no value to the inhabitants on the other side of the wall. Consequently I am of opinion that any scheme which leaves this portion of the wall defeats its own object.

"Now to turn to the question of building or not over this area. In the first place if the Circular Road is made a really broad thoroughfare, which is eminently desirable and so long as the new hospital does not abut directly on the road but stands in its own grounds, rather in the style of the Lady Hardinge Hospital, such as I believe is contemplated, there can be no possible objection to well-planned building on the north side of the Circular Road.

"Secondly the Municipal Committee proposes to lay-out the area with wide streets and every modern amenity. Thirdly this area is, and will be for some years to come, more suitable for buildings than the area to the south of the Circular Road and also as the Chief Engineer points out, it may be necessary later on to extend the hospital area further to the west than is contemplated at present.

"Finally I would venture to point out the fallaciousness of not regarding the question of Delhi as a whole. Delhi and New Delhi are regarded as separate entities because separate bodies control them, but really the question is one, namely, the accommodation and well-being of a large population which includes the Government of India for some five months in the year. I would mention that over a thousand of the clerks working in the New Delhi offices are not accommodated in New Delhi and the majority live in the city, as well as the clerical establishments of large departments like the Postal Audit and the Railway Clearing Office. Consequently the correct view to take is the large one and the question of the health of the city really affects the whole Delhi area. Stone walls will not keep diseases away and so long as the really terrible present insanitary conditions prevail in the city, only a false sense of security can be felt with regard to the health of New Delhi, in spite of the modern sanitary conditions which prevail there."

A note which the Hon'ble Mr. Hailey wrote in a similar connection and which substantially applies to this question also convincingly disposes of the Chief Engineer's objections. He said :—

"The second reason alluded to above is the necessity for the removal of the city wall at this point. The wall forms the boundary of a congested area to which it prevents the access of air and in other ways hampers sanitary operations. It is therefore proposed to demolish it and build over the city ditch.....As regards the policy of demolishing any part of the city wall, I may note that it has been necessary in the past to pull down considerable portions in order to give access to the railway. The wall was built under British superintendence... and is not therefore of any great antiquity....I am however strongly in favour of maintaining intact such portions of it as are important from an historical or aesthetic point of view. For historical reasons I would not disturb any part of the wall in the length running from the Water Bastion part, the Kashmeri and Mori Gates as far as the Kabuli Gate,.....for aesthetic reasons I would preserve the river front facing both the civil and military Belas".

So that the wall between the Ajmeri Gate and the Delhi Gate has, like the wall between the Kabuli and Lahori Gates, neither a historical nor an aesthetic value which need prevent its demolition. After the remarks of the Hon'ble Mr. Hailey and of the Chief Medical Officer, the Chief Engineer's objections can be taken to have no force.

From earliest times it has been usual to demolish fort walls when they have stood in the way of city extension. One notable example is that of ancient Dwarka, one of the important places of Hindu worship, whose walls were pulled down, ditches filled up, surrounding area cleared and the land adjusted for the extension of the new city.

A little careful study of the whole question will show that while every one possessing intimate knowledge of city conditions such as Col. Beadon, the Hon'ble Mr. Hailey, Mr. Johnson, and Col. Franklin, the Chief Medical Officer, realised the difficulties of the city, the Chief Engineer and the Government of India, who could not be expected to have as intimate a knowledge of

city problems, were not however deterred from deciding against the Municipality's requests when occasion arose. I wish that the Chief Engineer was a member of the Municipal Committee: and I hope and trust that the new Chief Engineer at least will approach the subject in a more liberal and generous spirit.

In pursuance of the second resolution a deputation from the Municipality waited on the Chief Commissioner, but the rock on which the whole scheme burst was the stand taken by the Chief Engineer.

In the address presented to the Chief Commissioner in 1928 the Committee reiterated their conviction: "Being an ancient and walled city our most acute problem is that of city extension. It is well known to you that the extensions already taken in hand fall far short of our needs. After long consideration we are convinced that our needs can best be met if the city wall between the Ajmeri Gate and the Delhi Gate is removed and the city allowed to expand southwards on the large plot of land lying vacant outside."

The Solution.—The problem of city extension has become so acute that there is no longer any time for further dalliance. After the statement of the case above I trust that Government will realise the expediency and necessity of allotting forthwith the whole of the land including the city wall which lies to the north of the G. I. P. Railway line up to Paharganj Bridge, as also the Malkaganj area, the golf course up to the Viceregal Lodge and the nursery limits as shown in the accompanying sketch for the extension of the city and hand them over to the Municipality for being developed in its own way. The sketch shows the present boundary of the municipality as also the proposed boundary in colour. While the present area is 6.02 sq. miles it is proposed to take .85 sq. miles in the south and 1.42 sq. miles in the North. The area will then become 8.29 sq. miles for a population of 3,47,592. The Notified Area will still be left with 5.58 sq. miles for a population of 17,000. Unless Government help the Municipality by giving it lands wherever available the problem of city extension must for ever remain unsolved.

Lands other than the western extension which would be suitable for accommodating a part of the over-populated city are :—

1. The land near Motia Khan between the Mutiny Memorial Road and the Punch Kuin Road.
2. The Malkaganj area and the land near by, with the golf course removed from its present site.
3. The land at present occupied by the R. M. Ry. shed and the Sleeper godown, which can be removed beyond Serai Rohilla.
4. The land parallel to the Kutub Road at present occupied by the unused portion of the canal which can be filled up. The Canal between the *Bangash* and the *Mithai ka* bridge to be arched over and the land used for buildings.

I have no desire to be unfair to Government or attribute to them motives which are anything but creditable. I do not say that they have, regardless of the health of the citizens of Delhi, stood in the way of city extension merely because they did not want to forsake the revenues they derived from the lands proposed to be converted into extensions. But I do maintain that they have shown a lamentable lack of appreciation of the gravity of the situation from the point of view of the health of the city. I have already in another place acknowledged gratefully the several grants of small bits of land which Government have made to the Municipality for purposes of schools, dispensaries etc. But in a matter far more vital, the attitude of Government shows a contrariness which is hard to comprehend. That the city is, owing to the congestion, a death-trap where everyone daily runs the risk of catching his death germ, no one who knows the city intimately will deny. Of the fact that the work of extension by a government agency is not feasible, the undeveloped state of Daryaganj and the western extension, is significant evidence. The explanation for the failure of Government in improving the extensions lies no doubt in the fact that Government are pre-occupied with a number of other duties which prevent them from giving due attention to this matter. That seems to me to be all the more reason why the extensions should be handed over to the Municipality for being developed. A local body understands its problems much more thoroughly and appraises their urgency much more accurately than a Government whose only source of information is the reports of its officers. If in other branches of administration Government

so firmly believe in the "man on the spot" theory, they should do so much more implicitly in the case of municipal administration. I think that, to carry the greater conviction, the case for the Municipality should be stated as far as possible out of the mouths of Government's own officers. It was the opinion of Col. Beadon that "If the local improvements are made at the expense of the Delhi Municipal Committee it is quite clear that the local body must be recouped by the profits from sale or leases of the building sites. For unless this is permitted, it is impossible for the Municipal Committee to carry out the work. When Government (who, after all, became owners of the land by escheat) entrusted the Municipal Committee with the management of the nazul lands it did so with the avowed object of furthering the prosperity of the city and it was not the intention of the Government that the land should be administered on principles which would create only indifferent progress but rather that the administration should cause permanent development of a laudable type. In the circumstances I advise that the proviso which I have mentioned above may be enforced and that the sale proceeds of plots sold may be credited to the funds of the Municipal Committee." (The proviso is to the effect that the proceeds derived from the sale of nazul lands must be credited to provincial revenues except in special cases under the orders of Government, but that income derived from leases are to be credited to the Municipality.) Col. Beadon further said "By reason of the exceptional and sudden demand for a higher standard of administration the Municipal Committee is being literally managed from hand to mouth."

The Hon'ble Mr. Hailey said in the course of a letter to Government: "I recommend that the Municipal Committee be (1) granted a loan of Rs. 1,50,000 to enable it to develop the site and (2) be allowed to take credit for the proceeds of the sale of shop sites, the repayment of the loan forming the first charge upon all receipts from such sale.....As I have already pointed out the land is not at present a source of income either to the Government or to the Committee and there will, therefore, be no real sacrifice on the part of the Government and I fear that there is little chance of this improvement being carried out unless the Committee is allowed to alienate the property and take credit of the proceeds." Mr. Johnson said as follows: "Re-

garding our new proposal, Ajmeri Gate-Delhi Gate. If anything is to be done in this line then the next question that arises is the agency whereby it should be done. If it can be said that it is for Government themselves to work the scheme as in other areas and Government estates such as Multani Danda, Burn and Garstin Bastion Roads, Daryaganj and the western extension, then my reply would be that we already have financial commitments in those directions which are as much as we can cope with and that no little difficulty is being experienced in obtaining Government grants for the work which still remains to be done in portions of those areas. With those schemes still in hand, it would probably be found no easy matter to obtain from the Government the considerable sum required to finance the acquisition of the slum areas as contemplated in the present proposal." In another note Mr. Johnson said: "A subject which requires brief mention here is the improvement and lay-out of the Daryaganj area, a partial scheme for which in south Daryaganj is at present awaiting a grant of Rs. 67,000 from Government, the estimate and plan for which were submitted to the Chief Commissioner in August 1925. The cost of the whole Daryaganj area will be considerably greater". The financial position of the Government of India is, if anything, worse now.

It may be argued that no distinction should be made between private and Government ownership of lands and that if the Municipality does not charge anything for its services from private landlords it should also supply its services free in cases where Government is the landlord. My reply to this argument would be that there is a vast difference between private ownership and Government ownership. In the first instance, the Municipality does not undertake any service inside the landlord's property. It can compel him to make proper drains and have them connected to the Municipality's sewers. Nor does the Municipality light the streets, or build or maintain roads for the benefit of private landlords. There is a further important point to be considered, namely, that the private landlord lives in the city and all the money he gets as rent is spent in the city in one form or another, thus contributing to the welfare of the city or of the citizens, and consequently of the Municipality. The cost of numerous charitable institutions maintained by the public such as schools, colleges, reading rooms, libraries, orphanages,

dharamshalas, endowments for hospitals, dispensaries and scholarships must run into a huge sum yearly. Where Government is the landlord the money is taken away from the city, perhaps to be given in the shape of grants to more fortunate sister municipalities.

The Municipality is not the only critic of Government in their capacity of landlord. The "Times of India", whose pen is popularly, though it may be mistakenly, supposed to be dipped in government ink and which, it is not expected would criticise Government in a partisan spirit, said in a leading article a short time back :—

"A new illustration of the muddle which the Government of India have in some respects made of the development of their new capital is provided by the petition which residents in old and new Delhi have presented to the Chief Commissioner of Delhi on the subject of high rents. The difficulties of which the petitioners complain were bound sooner or later to arise.....Government's policy made it inevitable...The real profiteers in New Delhi are the Government of India. Having passed orders that their own residential buildings were to be designed for cold weather occupation only, and knowing therefore that landlords building houses for the annually migratory population would have to get what return they could on their money by letting for only five or six months in the year they sold building plots by tender and auction for the highest bids they could secure and made certain that their new capital should be a most expensive place to live in".

In order that such mistakes may not be repeated in the case of the city extensions and in order that they may be improved speedily I have advocated the transfer of the lands to the Municipality. Provided the extensions are made over, the Municipality can be trusted to render them habitable as expeditiously as it can. As we have seen, Government spent on the Burn Bastion Road scheme Rs. 1,32,000 and got a return of over Rs. 5 lakhs and are besides getting an annual ground rent. The arguments of the Madras Local Self-Government Department for transferring to the Municipality the income from these ground-rents apply with equal or greater force in the case of Delhi extension schemes. But in the present state of the Government finances they cannot be expected to finance these schemes and develop the extensions. One of the reasons which has not facilitated the rapid improvement of the western extension may be the leasehold nature of the building sites offered there. Giving

out land on leasehold adds to the difficulties of financing the scheme as well as restricts the outlay by investors on the buildings to be erected. Whereas purchasers will be prepared to buy sites outright and spend liberally on developing them they hesitate to invest freely in leases for however long periods. If the Government would realise this, they would not suggest, as they have done, that the Municipality should meet the cost of its services in the extension by means of raising the house tax. Even a fourfold enhancement of the house tax would not cover the cost of the essential services and is the surest way of rendering the extension unpopular, when on the other hand every effort should be made to encourage migration to it. Not only should building sites be given on attractive terms to the public but inducements should be offered to them in the shape of provision of quick and cheap means of mechanical transport, of good roads, of lighting, and more important than all these, of water-supply and drainage.

There is another site which is eminently suitable for purposes of extension, if not for the accommodation of buildings, at any rate for the provision of a park or parks for either men or women or both. I refer to the lands on the eastern side of the Mall Road from the junction of Khas Road right up to the Monkey Hill. This bit of land should be levelled and converted into a park. It should be declared out of bounds of the Fort Authorities and transferred to the charge of the Municipality. As we have seen, there is a great dearth of parks in the city, for which therefore there is a crying need. The number of visitors in the Edward Park both in the mornings and in the evenings prove the demand for another such park in that locality and one could suitably be provided on the site I have suggested.

When the capital was transferred to Delhi it was hoped that the city would be immensely benefited under the immediate and fostering care of Government but what has actually happened is that the city has been saddled with a number of responsibilities which its poor resources do not enable it adequately to fulfil.

Government help which the city has had reason to expect has not, commensurately with the burdens imposed on it, been forthcoming. We thankfully acknowledge such grants as the

Government of India have been pleased to give to the Municipality. It should be emphasised however that such grants have not been proportionate to the demands made upon the Municipal Committee by reason of the transfer of the capital of India to Delhi. If in recent years the Municipal Committee has secured grants from Government towards the improvement of its water-supply and the clearance of its slums it is due to the efforts of the Hon'ble Sir John Thompson, the Chief Commissioner, and to the personal interest that Lord Irwin evinced in the welfare of the city. But for them it might have been years before the Lazarus lying at Dive's gate and crying for the healing of his sores attracted any attention.

I give a statement below which shows the extent of the assistance which the Municipality has received from Government as well as the additional charges the Municipality has had to meet.

| Increased expenditure the Municipality has had to bear. | | Government Grants. | |
|---|-----------|--|----------|
| | | 1930-31. | Rs. |
| 1. Audit charges, (average of 5 years) | Rs 10,057 | Grant for maintenance of Government gardens. | 18,000 |
| 2. Fire Brigade. | 31,713 | Compensation for Nazul lands. | 40,000 |
| This figure is steadily increasing and the expenditure last year was as much as Rs 77,159 | | Towards expenditure on Government property | 25,000 |
| 3. Loss of profit from sale of water to the Notified Area. | 1,09,000 | Income from House tax from above property (1929) | 10,047 |
| 4. Loss of income from sale of manure and city sweepings (about) | 20,000 | Education. | 1,31,000 |
| 5. Cost of providing services in the Government properties of Daryaganj, Garstin and Burn Bastion Roads and Western Extension | 75,584 | Infant Welfare scheme. | 17,000 |
| 6. Loss due to purchase of water from the Water Board instead of pumping our own, amounts to Rs. 1,24,595 Less realized on interest. Rs. 30,000 | | Civil Hospital Eye Ward. | 5,000 |
| Nett. | 94,595 | Half pay of S. A. S. for verification of causes of deaths. | 1,708 |
| 7. Loss of income from Nazul lands (This is the income for the year in which the Municipal Committee handed over charge of the lands to Government) | 88,509 | Grant towards Rat Destruction Scheme. | 9,869 |
| | | Grant towards salary of Health Officer | 7,300 |
| | 4,29,458 | | 2,64,424 |

(The figures of Government grants relate to the year in which the grants were the highest, the average of the last 10 years being only Rs. 1,34,991.)

Though Government grants have been inadequate, the Municipality is nevertheless grateful for such as have been given by Government for purposes of education and medical relief.

Over and above this, the Municipal Committee will be faced in the near future with a non-recurring expenditure of Rs. 4,02,500 and about 33 per cent more due to increase in duties and the appreciation in the value of the Dollar, and a recurring expenditure Rs. 2,87,597 for mechanical transport, minus Rs. 66,000/- the present cost, for removal of night soil and refuse farther away from the city. The expenditure is largely due to the transfer of Capital to Delhi and Col. Beadon's remark "that the Municipal Committee is being literally managed from hand to mouth" applies to this with greater force.

Notes on Some of the Above Items.

3. The cost of raising water in 1923-24, when the Municipality managed its own water-supply was 2.44 annas per 1000 gallons which cost was subsequently declining steadily. The cost of raising water under the Board's management rose in 1925-26 to 3.97 annas; in 1930-31 it came down to 2.61; that is, a difference of 1.36 annas or 33 per cent. On this same proportion the cost to the Municipality would, had the works remained its own, have been only 1.63 annas per 1000 gallons. The Municipality used to sell water to the Notified Area at the rate of 6 annas per 1000 gallons and its bill on this transaction in 1923-24 amounted to Rs. 1½ lakhs. On 40,00,00,000 gallons at the reduced cost of 1.63 annas per thousand gallons we should have made a profit of Rs. 1,09,000.

4. It is not possible to find out the correct figures of the loss sustained by the Municipality on account of rents from lands, of sale of manure, of sullage water, of sweepings etc. but it may be taken to amount to a modest figure of Rs. 20,000.

5. This expenditure is for 1928-29, the latest year for which figures are available, and it is notable that the expenditure here is steadily rising and has gone up from Rs. 38,521 in 1925-26 to Rs. 75,584 in 1928-29.

6. Had we run our own Water works instead of buying our requirements amounting to 19,93,528,000 gallons at the rate of 2.61 annas as at present, we would have raised our supply at 1.63 annas and thus saved Rs. 1,24,595, in one year at the rate of an anna less per thousand gallons, less, of course, Rs. 30,000 which we get for interest charges. The net loss therefore has been Rs. 94,595 per year. Some people might regard the figure of 1.63 annas per 1000 gallons as difficult to attain but in fact this was the cost before, and the lowest cost of raising water under the Board's *regime* is higher than the highest cost to the Municipality except in one year.

I will explain this point in another way. Government, in spite of the Municipality's disinclination expressed repeatedly, were so anxious to take it as a partner in this ill-designed and costly scheme that they agreed to accept a loss of Rs. 90,000 interest charges by writing down the cost by Rs. 18 lakhs and to guarantee that the cost of water to the Municipality should not exceed 3 annas per 1000 gallons, the difference, if any, being paid by Government. On account of this guarantee the Government have sustained a further loss of at least Rs. 1 lakh.

The standing charges of the Water Board are Rs. 1,74,860 for interest, Rs. 7,500 for laboratory, Rs. 23,730 for supervision, and Rs. 8,754 for general administration or a total of Rs. 2,14,844. Since the Municipality has subscribed 65 per cent of this sum it means that the partnership in the Board costs the Municipality Rs. 1,39,520 or less Rs. 30,000 realised as interest, Rs. 1,09,520, to the direct benefit of the Government. It should also be remembered that the cost even on the direct expenses also would have gone up if the Municipality had not taken 65 per cent of the water-supply.

The increased cost in the raising of water does not imply any improvement in the quality of water, for, as I have mentioned elsewhere, there is no indication of any decrease in the prevalence of epidemics in which the quality of water is a factor.

Let us take the grant that Government give us for education. The figure of Rs. 1,31,000 may appear at first sight to be a considerable grant. But a close examination will reveal that

Rs. 53,630 are grants to private institutions paid through the Municipality. The Municipality is only an agent for the payment of this sum to private institutions in the city and the extent to which it is benefited by the grant is only by the balance of this sum.

I have often heard it said by many Government officials that the Municipality of Delhi is very liberally treated by Government in the matter of grants; many of my colleagues would seem to entertain that belief. Unfortunately, however, officials who make this statement and my colleagues who are persuaded to believe in it when they hear it repeated so often are both under a misapprehension of the actual state of affairs.

About the recurring grants I have already dealt with; regarding special grants I say a few words below. Taking the average for the best five years the special grants amount to Rs. 2,22,052. This figure has to be examined from two points of view, whether these grants are commensurate with the responsibilities and obligations the Municipality has had to shoulder by reason of the enormous increase of population occasioned by the transfer of the capital to Delhi and whether they have been, if not on a par, at any rate, more or less on a proportionate scale, with those given to sister municipalities. The fact that Government assistance to the Municipality, to enable it to undertake the onerous obligations imposed on it as a result of the transfer of the capital, is pitifully inadequate, must have been clear from the foregoing pages. That it is treated unequally with some other municipalities, not that I grudge their good fortune, I propose to show by making a comparison with the Delhi Notified Area Committee.

The Notified Area covers an extent of about 7 sq. miles to accommodate a population of 17,000; the city is 6.02 sq. miles in extent and holds within its limits 3,47,592 persons. The taxation per head of population in the Notified Area is Rs. 4-7-8; taking the total income, the Notified Area Committee has an income of Rs. 28 per head; while in the city, the taxation per head is Rs. 5-12-7 and the income of the Municipality is Rs. 9-10-5 per head. The disparity will be the more striking when we remember that the population of the Notified Area belongs to the wealthier classes, while that of the city is composed largely of the middle and the poorer classes, on

whom any taxation operates as a burden. The Notified Area gets a government grant of Rs. 14-8 per head ; while the city gets a grant of Rs. 0-9-7 per head. The income from Nazul lands is Rs. 9,000 in the case of the Notified Area while in the case of the City Municipality it is Rs. 40,000 ; in other words Rs. 0-8-6 per head in the case of the former ; and in that of the latter Rs. 0-1-9 only. The Notified Area gets a *per capita* grant of Rs. 1-11-2 for education whereas the city gets Rs. 0-3-6. It should not be supposed that the disparity is due to grants towards European education in the Notified Area, for there is no school there for either Europeans or Anglo-Indians. In the case of hospitals, the Notified Area Committee gets a Government grant of Rs. 79,576 for its four hospitals, or a grant of Rs. 4-11 per head ; in the case of the Delhi Municipality the grant is Rs. 10,266 including Rs. 5,000 given for the Eye Ward, which works out at 0-0-5 per head.

Thus, we have the spectacle on the one hand of a population able to pay more for their civic amenities not only lighter taxed but very liberally subsidised by Government, and on the other, of a population on a majority of whom any taxation, as I have said, is a burden, whose urgent and varied needs are provided only in an inadequate degree owing to the limited resources of its civic administration. On the one hand, of a local administration with its exchequer overflowing with money, and on the other, of a neighbouring administration in a state of chronic poverty, starved for funds even in respect of vital and urgent schemes. On the one hand again, of a local administration so generously fed with Government grants as to be placed in an embarrassing position, embarrassing in the sense that it hardly knows with such a surfeit of funds what to spend the money on and, on the other, of a Municipality whose needs however deserving they may be to be subsidised, fail to receive much encouragement from Government.

I know the present financial position of the Government of India and I will not embarrass them by clamouring for more grants. I do not ask for further grants for any new schemes nor do I ask for any special grants, but the Government should in reason give us such grants towards all schemes to

which we have committed ourselves on their assurances. These grants may however be spread over a longer period. But so far as the question of placing in the hands of the Municipality all Government lands, particularly those up to the G. I. P. railway line on the south, up to the limit of the extensions on the west and up to the nursery on the north, is concerned, it brooks no delay. I have perhaps urged this step repeatedly in the course of my remarks in this part and my submission would be that it may not be taken too late, for the health of 3,50,000 citizens is involved. If this is not done at once, then any help which Government have been giving us towards Child Welfare exhibits, Maternity Centres, health visiting etc. would only be a farce. All the recommendations which the Labour Commission and other Commissions make would have been a cry in the wilderness and the indictment, by welfare workers from America and the West, by Miss Mayo and others, that our housing arrangements are perfectly horrid, that single tenement rooms house large families and that single rooms moreover complete their kitchen, dining room, bed-room, drawing-room and a confinement room, would have only been too true and deserved.

If this review serves even in a small measure to arouse interest in H. E. the Viceroy, Sir George Schuster, Sir Fazl-i-Hussain, the members of the Central Legislature, particularly those on the Standing Finance Committee, in whose hands the disposal of the country's votable expenditure lies, the local Government, the Chief Engineer, and last, though not least, my colleagues on the Municipal Committee, I shall have been amply rewarded for the task I have set myself to do.

In coming to the end of this survey I have to acknowledge the valuable and prompt assistance which I have received from all officers of the Municipality in its preparation. I know how much the Municipal officers are over-worked but their readiness in spite of it, to co-operate in any work which they believe would advance the cause of the city, is commendable.

I also tender my thanks to other friends who have helped in the bringing out of this note, particularly to Mr. T. K. Santanam, but for whom I might not have been able to fulfil my desire for some time.

APPENDICES.

Estimate prepared by Dr. K. S. Sethna for Running a Maternity Home Containing 50 beds.

If a Model Maternity Home is to be built

1. Land. Cost will depend on its location.
2. Building.
 - (a) For waiting patients.
One general ward to contain 6 beds.
 - (b) Labour rooms.
 - (1) One room of size 10' X 10'
 - (2) Second room of size 16' X 10'
which could be turned into an
operation room when required.
 - (c) General Ward.
To be divided into sections.
Each section capable of accommodating 4 to 6 lying-in
women with their babies.
Total accommodation for 38 patients.
 - (d) Cubicle or one-room-ward.
These are for paying patients.
12 such cubicles or one-room-wards to be provided.
 - (e) Appurtenances.
Office or Duty-room.
Dispensary.
Septic cases room.
Lavatories.
Bath rooms.
Clothes drying room.
Kitchen.
Scullery.
Linen and stock room.
Washing room.
Relatives waiting room (better a portion of verandah or
compound)
 - (f) Staff quarters.
Sub-Assistant Surgeon (2 rooms, bath and kitchen)
3 Midwives (Dais) (one room each) }
3 Nurses ... (one room each) } Common bath room
Chowkidar. and kitchen.
3 Sweepresses (if suitable space for the quarters exists).

(g) Electric Light.

(h) Water pipes.

(i) Cost of construction of a model Maternity Home to accommodate 50 patients and the staff exclusive of the cost of the land would be about Rs. 75,000/-

Building on hire.

Hired houses suitable for running Maternity Homes on a large scale are scarcely available in the city. However it would not be difficult to take 2 or 3 contiguous houses on hire and with necessary alterations therein to turn them into a Maternity Home. The total monthly rent should not exceed Rs. 500/-

Initial Cost.

1. Cost of land.

2. Cost of Building Rs. 75,000/-

3. Equipment.

| | | |
|--|-----|------|
| 50 iron beds (for women) | Rs. | 1000 |
| 50 iron cots (for babies) | " | 750 |
| Durries for beds (2 for each) | " | 400 |
| Bed sheets (2 per patient, one bed will have on it 3 patients in one month, Therefore 6 bed sheets per bed. Therefore 300 bed sheets in all. | " | 500 |
| Bed sheets for babies' cots (similarly 300 in all) | " | 300 |
| Pillows (50 for patients) | " | 100 |
| Pillows (50 for babies) | " | 50 |
| Pillow cases (300 for women) | " | 300 |
| Pillow cases (300 for babies) | " | 200 |
| Sujni (150 for women) | " | 250 |
| Sujni (150 for babies) | " | 150 |
| Blankets (100 for women) | " | 500 |
| Blankets (100 for babies) | " | 250 |
| Mackintosh sheets (4' X 3' each) (100 for women) | " | 250 |
| Mackintosh sheets (2' X 1½' each) (300 for babies.) | " | 200 |
| Stools (50) | " | 100 |
| Towels racks (50) | " | 100 |
| 50 Teapoys (with food-safe arrangements) | " | 400 |
| Patient Charts Boards (50) | " | 50 |
| 2 Labour rooms equipment— | | |
| 2 beds, 4 small tables, 2 chairs, 2 almirahs, 2 special electric lamps, wash basin stand, jugs, Lotion jars, towels, mackintosh etc. | " | 500 |
| Midwifery instruments. | " | 500 |

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| | | |
|---|---------------|------------------|
| Steriliser for instruments | " | 100 |
| Steriliser for diapers, cotton, tow, etc. | " | 750 |
| Surgical table and stool. | " | 150 |
| Office or duty room (one table, 3 chairs 2 almirahs etc.) | " | 100 |
| Dispensary (counter, medicines, weighing scales, bottles etc.) | " | 300 |
| Septic Room (bed, table, etc.) | " | 75 |
| Bath basins for babies (10) | " | 40 |
| Clothes drying room apparatus | " | 100 |
| Kitchen (utensils, vessels, cups, etc.) | " | 300 |
| Scullery equipment. | " | 100 |
| Linen & stock room (6 big almirahs) | " | 300 |
| Furniture for staff quarters (1 S. A. S., 3 Dais and 3 nurses) | " | 1500 |
| Stationery, paper racks, etc. | " | 50 |
| Contingencies and unforeseen. | " | 500 |
| | Total. | Rs. 11215 |

| | |
|---|---------------------------|
| <i>Monthly Recurring Cost.</i> | Rs. |
| 1 S. A. S. | " 150 |
| 3 Midwives (Dais) at Rs. 40 each. | " 120 |
| 3 Nurses at Rs. 40 each. | " 120 |
| 3 sweepresses at Rs. 12/- each. | " 36 |
| Peon | " 15 |
| Chowkidar | " 15 |
| Soap, Mackintosh, Coal, cotton, tow etc. | " 120 |
| Linen, Bed niwar replacement etc. (monthly basis.) | " 100 |
| Water rate. | " 30 |
| Electric Current charges. | " 80 |
| Telephone. | " 21 |
| Medicines and disinfections. | " 100 |
| Diet to Patients at Re. -/12/ per day. | " 1125 |
| Cook. | " 25 |
| Utensils cleaner (Masalchi). | " 20 |
| Contingencies unforeseen. | " 250 |
| | Total p.m Rs. 2327 |

Notes.

1. 4 such Maternity Homes of 50 beds each may be opened in 4 suitable localities of the city.

2. The above is a unit of cost for a 50 bed Maternity Home.

3. All the 4 Maternity Homes should be under the charge of a well qualified and experienced lady doctor whose salary should be from Rs 400 to 500 with suitable free quarters at one of the units (the cost of which is not and cannot be shown in the estimate for one unit).

4. In every unit there should be 12 paying-rooms and these should be let out at varying charges from Rs. 1 to Rs. 3/- per day according to accomodation etc. offered.

5. Arrangements should be made to provide separate nurses, if required, on extra payment.

6. A 50 bed unit, considering that every patient remains in the Home on an average of 10 days, will be able to deal with 150 Maternity cases a month i. e. 1800 a year, 4 such units therefore will be able cope with 7200 Maternity cases in a year. The number of births during the year 1930 in Delhi city was 13,996. Thus 4 units of 50 beds each should, if patronized, be able to provide for half the number of Maternity cases in the city.

**Estimate by Dr. K. S. Sethna for a
Nursing Home containing 20 beds for Males.**

| <i>Initial Cost.</i> | Rs. |
|---|-----|
| 20 beds | 400 |
| Bed sheets (100) | 170 |
| Durries (40) | 160 |
| Pillows (40) | 80 |
| Pillow cases (80) | 80 |
| Sujni (40) | 70 |
| Blankets (40) | 200 |
| Mackintosh | 100 |
| Towel racks (20) | 40 |
| Teapots (with food safe arrangement) (20) | 160 |
| Patient-chart boards (20) | 20 |
| Surgical instruments for minor surgery and dressing | 300 |
| Steriliser for instruments. | 60 |
| Steriliser for dressing etc. | 150 |
| Surgical table | 150 |
| Furniture for office or duty room | 100 |
| Dispensary (counter, medicines, weighing scales, bottles etc) | 600 |
| Basins, jug, bowls, stands etc. | 150 |
| Kitchen (utensils, vessels, cups etc) | 200 |
| 4 Almirahs (for linen, stock etc) | 200 |
| Furniture for staff quarters | 500 |

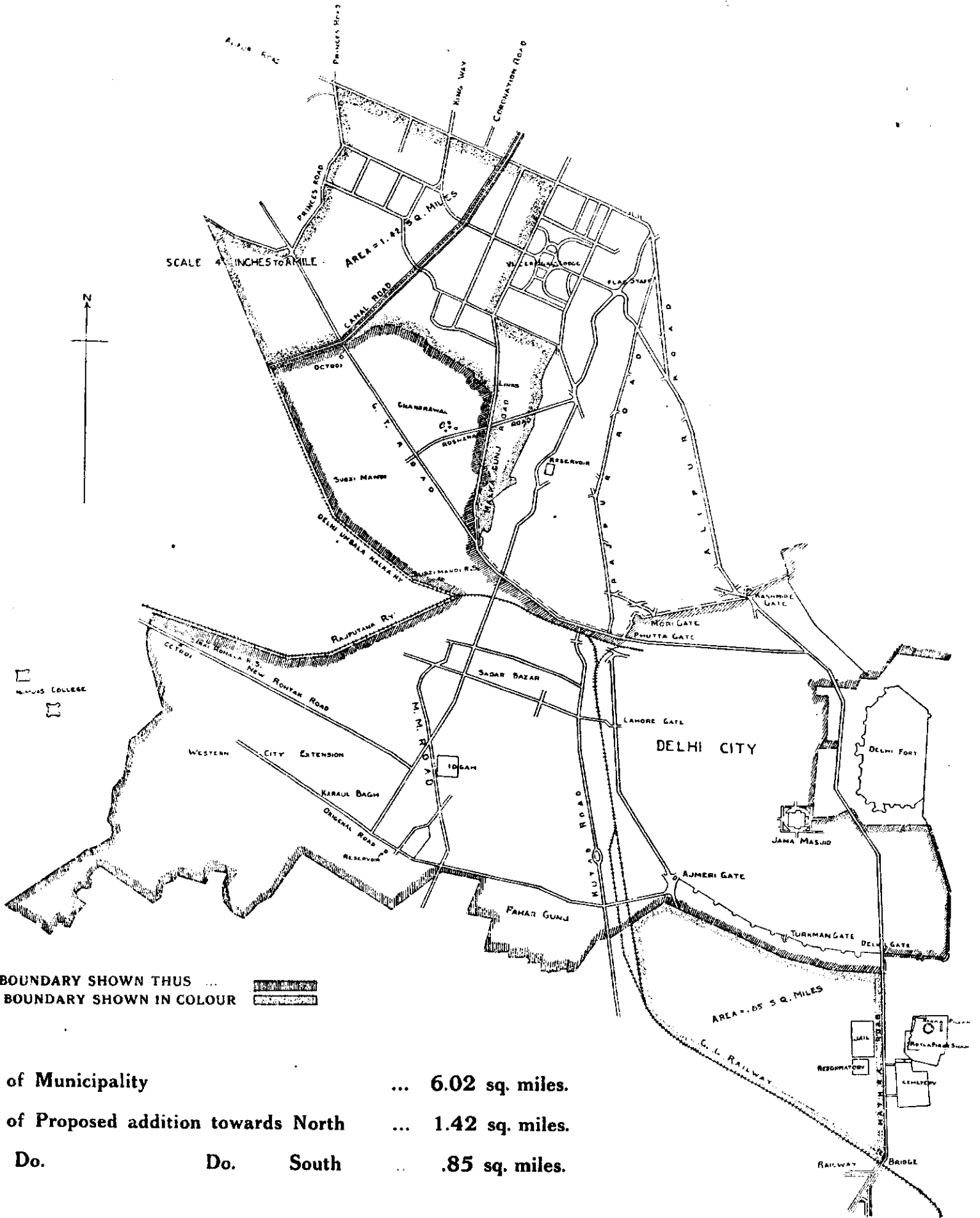
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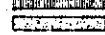
| | | |
|---|-------|----------|
| Sullery equipment | .. | 100 |
| Stationery, paper racks, temperature chart etc. | .. | 50 |
| Contingencies and unforeseen. | .. | 500 |
| | ----- | Rs. 4540 |

| <i>Recurring Cost.</i> | Rs. |
|---------------------------------------|----------|
| Rent of building | .. 300 |
| Sub-assistant Surgeon | .. 150 |
| 2 nurses at Rs. 40 each | .. 80 |
| 2 ward attendants at Rs. 25 each | .. 50 |
| Linen, Bandages, cotton etc. | .. 100 |
| Medicines | .. 300 |
| 2 sweepers at Rs. 13 each | .. 26 |
| Electric current charges | .. 40 |
| Water rate | .. 15 |
| Chowkidar | .. 15 |
| Peon | .. 15 |
| Diet (at Rs. 1/- per patient per day) | .. 600 |
| Cook | .. 25 |
| Masalchi | .. 20 |
| Contingencies and unforeseen charges. | .. 100 |
| | ----- |
| Total p.m. | Rs. 1736 |

Notes.

- 1 The accomodation should be of 2 types.
 - (a) General Ward—
The charges per head to be Rs. 3/- per day.
 - (b) Separate (one bed room) ward.
The charges to be Rs. 5/- per day.
These charges should include cost of accomodation, nursing, ordinary medicines and diet.
For special medicines and separate nurse extra charges to be levied.
- 2) Any patient desiring consultation with any doctor from outside should be allowed to have it at his expenses.
- 3) Any operation performed in the Nursing Home, the operating Surgeon shall pay to the nursing home (a) for the assistance rendered by the Sub-Assistant Surgeon of the Home and (b) 30 per cent of the fee received by him from the patient.



Note: EXISTING BOUNDARY SHOWN THUS ... 
 PROPOSED BOUNDARY SHOWN IN COLOUR 

| | | |
|---|-----------|--------------------|
| Area of Municipality | ... | 6.02 sq. miles. |
| Area of Proposed addition towards North | ... | 1.42 sq. miles. |
| Do. | Do. South |85 sq. miles. |

Bengal Economic Situation Committee.

CHAPTER I.

SCOPE AND OBJECT.

Towards the last week of February this year indications were distinctly available of a likely political settlement preparatory to the participation by the Indian National Congress in discussion with the representatives of the British Government and the spokesmen of other Indian political parties regarding the future constitution of this country. Some of us who were more optimistic about an impending settlement on the current political issues considered that the time had arrived when public opinion should address itself towards an instructed study of the wholly different problems which are likely to be presented in a new form of constitutional discussion. Those among us who conceived the idea of such a study pointed out to the rest of us that despite the valuable work on constitution-making rendered by the All-Parties' Conference of 1928, there remains even to-day a narrow but extremely important field in which no attempt has been made to formulate constitutional proposals from the nationalist point of view. What the advocates of the study had in view was that the Nehru Committee had dealt with only the broader frame-work of a nationalist constitution both at the centre and in the provinces. The relation between the two had not been fully and carefully defined. It is true that the Nehru Committee had drawn up from their point of view two lists of central and provincial subjects. But from the very conditions under which the Committee discharged their duty it is neither unfair to the Committee nor unjustifiable for us to assume that the question could not be examined with the thoroughness it demands. In regard to the division of fiscal resources between the centre and the provinces, the Nehru Committee preferred to leave the matter unsettled for the present. The political situation in India has rapidly changed since the Nehru Committee published their Report. In the first place, the federal idea has received a large and wide measure of support from public opinion. The federal basis, on which we

Genesis and character
of the study undertaken.

presume the new constitution will be built, itself renders a division of powers between the centre and the provinces a constitutional issue of first rate importance. The federal ideal in its strict logical form being not within the ken of the Nehru Committee, naturally the question of division of powers did not as seriously exercise their judgment as it must in any future discussion of a new constitution. Secondly, the Labour Government's offer of embarking India on a new constitution as made in Mr. Ramsay MacDonald's statement on January 19 last, gives a reality and vital character to any constitutional discussion which could not attach to it when the Nehru Committee carried on their labours.

2. Those who put forward these arguments in favour of a fresh study of the constitutional problem emerging out of a new relation between the centre and the provinces impressed the rest of us who did not originally conceive it. We were convinced that a study of a wholly new character other than what the Nehru Committee had undertaken was called for in view of the forthcoming discussion of a future constitution in a resumed Round Table Conference. It is also not unlikely that prior to its deliberation in a conference representing all sections of British and Indian political opinion, the various political parties of the country for themselves would endeavour to arrive from their point of view at certain conclusions regarding the major, if not the entire, field of the new constitution. The present study, therefore, is expected to be helpful both to the sectional and representative discussion of new constitution which, as now arranged would take place in the coming months. It is necessary, however, to emphasise that the kind of study which we have felt called upon to undertake in relation to the constitutional issues mentioned above are more of an economic character. We have no difficulty in recognising that so far at least as the division of powers between the centre and the provinces is concerned, other considerations than mere economic will determine the line of division. But we have deliberately refrained from treading a wider field. Our whole object throughout the study has been to survey as far as possible the financial and the economic situation in the Province of Bengal in so far as it has any bearing on the all-important constitutional issue, namely, the division of powers and resources between the central and provincial governments.

3. Having generally indicated the character and origin of the particular study we have undertaken, we feel we might define its terms with certain amount of precision. The task we have imposed upon ourselves in the following pages is

Value and character of the study.

Terms of study stated.

To study the present financial position of the Government of Bengal with reference to its inherent weak points and special liability for expenditure and to make suggestion as to the new sources of revenue which from Bengal's point of view must be provincialised and

To survey the general economic position of the province with special reference to the present share which the men of the province bear in its trade and commerce and to recommend (1) what subjects of economic interest should fall within the field of provincial government, (2) what reservation, if any, should there be in the proposed convention of trading rights between the Indian and foreigners in the vital economic interest of the province, and (3) what constitutional safeguard there should be against the forward economic policy of other provincial governments or against trading activity of other provinces prejudicial to the interest of Bengal.

These terms open out a very wide field of financial and economic study. The very short time within which we have decided to complete our labours will clearly preclude us from carrying it out with the thoroughness we might have aimed at or with any attempt at an independent collection of facts. Nevertheless, we are of opinion that even a pure compilation of scattered facts brought together under a common perspective will go eminently to serve our purpose. With this preliminary word of caution about the limitation to which our study is subject, we now pass on to embark ourselves on it.

Our conclusions have been formulated in various places of the report but will be found chiefly embodied in paragraph 20, last portion of paragraph 28 and in those numbered 40, 43 and 44.

CHAPTER II.

FINANCIAL SITUATION AND THE NEED FOR NEW REVENUE.

4. The financial plight of the province of Bengal can be read off at a glance from the following statistical table.

TABLE NO. I.

Expenditure per capita in various provinces based on the budget estimates for 1929-30.

| Province. | | | Rupees. |
|-----------|-----|-----|---------|
| Madras | ... | ... | 4,188 |
| Bombay | ... | ... | 8,291 |
| Bengal | ... | ... | 2,554 |
| U. P. | ... | ... | 2,729 |
| Punjab | ... | ... | 5,549 |
| B. & O. | ... | ... | 1,800 |
| C. P. | ... | ... | 3,792 |
| Assam | ... | ... | 3,920 |

It will be observed that the spending power *per capita* of Bengal is the lowest among the provinces without taking Bihar and Orissa into account. It is arguable, however, that the total expenditure of a province is often a misleading criterion for a judgment as to how far the financial policy of its government is being directed towards the real welfare of its people. There are undoubtedly such items as debt charges borne on the accounts of each province. It might be further contended that the cost of collecting revenue might vary from province to province owing to variation in local conditions. In other words, in the language of official accounts, such part of the provincial expenditure as the "direct demand on the revenue" or the debt service charge should not be taken into account in any computation of the provincial expenditure on a common denomination for our purpose. The force of such arguments may be recognised. An attempt may be made to assess the comparative financial position of the various provinces on a different common basis. Probably, the best course would be to ascertain what amount each province spends on the nation-building services. Taking Education, Public Health, Medical, Industries and Agriculture as the five nation-building departments, we have arrived at the following table which, it will be noticed, is illustrative of precisely the same lesson as could be drawn from Table No. I above.

TABLE NO. II.

Expenditure per capita on nation-building services based on accounts of 1928-29.

| Province. | Aggregate amount spent. | Expenditure per capita. |
|-------------|-------------------------|-------------------------|
| Madras ... | 4.25 | 1.00 |
| Bombay ... | 3.07 | 1.59 |
| Bengal ... | 2.73 | .58 |
| U. P. ... | 2.98 | .65 |
| Punjab ... | 2.90 | 1.40 |
| B. & O. ... | 1.47 | .42 |
| C. P. ... | 1.08 | .77 |
| Assam ... | .58 | .76 |

(Figures of Column 2 in crores of rupees and figures of Column 3 in rupees only.)

Roughly speaking, the Punjab and Bombay spend respectively 166 and 133 per cent. more per head than Bengal on nation-building services; Madras spends roughly 66% and C. P. and Assam 25% more per head than Bengal under these items. Here also the only province spending per head lower than Bengal on nation-building services is Bihar and Orissa.

5. It is useless to comment further on the general position of weakness disclosed above in Bengal's financial situation. It would be instructive at this stage to analyse the real sources of weakness in her financial system. There are in our view three weak spots in it. In the first place, owing to Permanent Settlement of land in Bengal, the revenue from land is much lower than in the other provinces of corresponding rank. Secondly, the net irrigation revenue accruing to Bengal is distinctly lower than all the provinces with the exception of C. P. Thirdly, the excise revenue in this province compares very unfavourably with the two other progressive provinces, namely, Madras and Bombay owing, it appears, to a wider prevalence of drinking habit among the population in these two Provinces. It may be emphasised here that of the principal heads of revenues, which are provincial under the present Devolution Rules, land revenue, excise and stamp form the mainstay of provincial finance. It is the coincidence of two out of the three of these revenues as comparatively weak

Special weak points in Bengal's finance.

sources, which account for the real financial worseness of Bengal in comparison with others. The absence of a net irrigation revenue has accentuated the financial poverty of the province. It must have appeared from Table I above that the spending power *per capita* of Bombay is highest amongst the provinces. This has been made possible owing to the combination of circumstances that the province enjoys a fairly large revenue both from land and excise, higher in amount than those of Bengal and at the same time has a population little more than 60% lower than that of this province..

6. The yield from land revenue in various provinces is shown in the following table.

TABLE NO. III.

Land revenue in various provinces based on accounts for the year 1928-29.

| Province. | Figures in crores of rupees. | | |
|----------------|---------------------------------|-----|------|
| Madras | ... | ... | 5.24 |
| Bombay | ... | ... | 4.84 |
| Bengal | ... | ... | 3.26 |
| U. P. | ... | ... | 6.04 |
| Punjab | ... | ... | 2.77 |
| B. & O. | ... | ... | 1.73 |
| C. P. | ... | ... | 2.19 |
| Assam | ... | ... | 1.17 |

These figures exclude the portion of land revenue treated in the official accounts under the head "Irrigation," that revenue being earned as a result of special assessment on land for services rendered in connection with the irrigation. It will probably be criticised that the relatively low revenue of Bengal from land is ascribable to the inelasticity of her earning under this head being due to Permanent Settlement. Should Bengal have chosen to have made over to her land-holding class the benefit of unearned increment on land, it is only fair that she should reap the fruits of her own policy. The critics will probably go a step further and argue that if Bengal would not decide to levy a larger tax on land, she should try to make good her loss in land revenue by new or increased taxation from other sources. What is really sought to be conveyed by arguments of this character is that the low land revenue of Bengal is not an inherent weakness of her financial system but the result of a deliberate policy and as such cannot be emphasised in any comparative survey of the various provinces. We are by no means apologists of the Permanent Settlement of

land in Bengal, but we venture to feel that whatever criticisms can be levelled against Permanent Settlement, they are chiefly of an agrarian and less of a financial character. The system of land tenure that has evolved in this province in connection with the Permanent Settlement is liable to serious criticism, whatever their value may be. But it is mistake to suppose that so far as contribution to the provincial exchequer is concerned, the land in Bengal is, comparatively speaking, making a lower contribution than it does in other provinces. What is still more certain is that even if the Permanent Settlement were to be repealed in future, the provincial revenue would not be appreciably benefited. Turning first to a comparison of the contribution of land to the provincial revenue in various provinces, we set out below an instructive table.

TABLE NO. IV.

Yield from land revenue in various provinces per acre based on the acreage figures of 1927 and the land revenue from the accounts of 1928-29.

| Province. | Land revenue | |
|----------------|----------------------------|-----------------------------------|
| | per acre of total land. | per acre cultivated. |
| | according to survey. | land including current fallow. |
| Madras | .57 | 1.2 |
| Bombay | .61 | 1.14 |
| Bengal | .65 | 1.19 |
| U. P. | .88 | 1.6 |
| Punjab | .43 | .9 |
| B. & O. | .32 | .5 |
| C. P. | .33 | .7 |
| Assam | .31 | 1.5 |

(Figures of column 2 and 3 in rupees).

It will be noticed that judged whether in regard to the acreage under cultivation or the total acreage of cultivated and uncultivated land, Bengal cannot be regarded to be making an exceptionally low contribution towards the provincial revenue than land in other provinces. In popular criticisms against Permanent Settle-

ment the presumption is too glibly made that at every fresh assessment, the state absorbs for itself the unearned increment of land. Such a presumption seems wide of the truth. The Taxation Enquiry Committee in paragraph 92 of their Report adduce figures to show that during the period of twenty-one years from 1903-04 to 1923-24, while the index number of export prices of crop increased from 100 to 217 and the index number of the net areas sown increased from 100 to 107, the index number of land revenue increased only from 100 to 120.4. It is obvious that the assessment does not keep pace with the economic value of land, and as such, the theory of absorption of unearned increment by the state is largely mythical.

One more consideration may be referred to in this connection to bring home our argument that land revenue represents a real source of weakness in Bengal's financial position. Even if the Permanent Settlement were to be repealed, it is impossible not to recognise the vested interest created owing to the Settlement being in force for nearly 140 years. Apart from the estate-holders, there has been an amazing degree of sub-infeudation of land. Unless it is contemplated to expropriate the estate-holders as also the various classes of tenure-holders, the Permanent Settlement can only be repealed on payment of enormous compensation which means an enormous outlay of capital expenditure. What increase, therefore, might result to land revenue in Bengal from a repeal of the Permanent Settlement would be more than eaten up by the heavy deadweight interest charge payable on a big capital expenditure. It must again be made clear that we are considering here the financial aspect of Permanent Settlement and not the economic repercussions of the tenancy system necessarily resulting from it. We would also emphasise here our view that long years of vogue of Permanent Settlement have made it so intimate a part of our socio-economic system that its continuance to-day must not be lightly treated and the hazardous experiment of tampering with this system must be regarded as extremely inadvisable in view of the meagre chance of obtaining any substantial yield from an alteration of the settlement.

7. The second source of weakness in the financial position of Bengal is its lack of earning under the head 'Irrigation'. While valuable revenue has accrued to a number of provinces as a result of a large capital expenditure in connection with the irrigation operations, no such revenue of considerable magnitude accrues to this province. The following table indicates the comparative position of Bengal in regard to irrigation revenue.

TABLE No. V.

Irrigation revenue in various provinces based on the accounts of 1928-29.

| Province. | Net revenue deducting the working expenses of irrigation works of which a capital account is maintained but not including the interest charges on borrowed funds employed in irrigation. | Interest on borrowed capital employed in irrigation. |
|-------------|--|--|
| Madras ... | 1.83 | .53 |
| Bombay ... | .65 | .55 |
| Bengal ... | .01 | .18 |
| U. P. ... | .84 | .88 |
| Punjab ... | 3.74 | 1.20 |
| B. & O. ... | .20 | .20 |

(Figures in crores of rupees).

Here again it should be observed that Bengal fares worst among the major provinces in point of irrigation revenue. It will be further noticed that while the other provinces benefit from the irrigation operations in a varying degree, the Punjab being the most fortunate province in this respect, Bengal is not even able to show a credit entry on the revenue side, far less pay the interest charges. It is useless to offer further comment.

8. Still another source of weakness in Bengal's financial position is disclosed by a study of the excise revenue of the various provinces. It is true that the excise revenue of the province is derived from the restrictive excise duty on the consumption of intoxicants. Nor do we overlook the chances of a stronger prohibitionist policy being adopted by the future governments in India under altered political conditions. For the moment we are concerned with the facts of the financial system as it exists to-day. Even under the present government, on grounds of public policy it was not intended that the excise duty should have yielded any large revenue. But as a matter of practice, drinking habit and addiction to other intoxicants have proved stronger than the restrictive influence which even a high rate of excise duty could have exercised. The result has been that each of the provinces is now deriving a fairly fat revenue from this head. Here again a very poor, if not the worst

showing from the purely financial stand-point is made by Bengal, as the following table will bring out.

TABLE NO. VI.

Aggregate yield of excise revenue in various provinces based on the accounts of 1928-29.

| Province. | | | | Aggregate yield (in crores of Rs.) |
|-----------|-----|-----|-----|--|
| Madras | ... | ... | ... | 5.58 |
| Bombay | ... | ... | ... | 3.92 |
| Bengal | ... | ... | ... | 2.24 |
| B. & O. | ... | ... | ... | 1.89 |
| U. P. | ... | ... | ... | 1.30 |

It is not to be presumed, however, that the lower excise revenue in Bengal is due to the duty being kept at an exceptionally high figure. The rates of duty in the major provinces vary within a certain range but the real variation in aggregate yield is due to the disparity in drinking habit as may be ascertained from the following figures culled from the Report of the Taxation Enquiry Committee.

TABLE NO. VII.

Particulars regarding consumption of country liquor in various provinces in 1923-24.

| Province. | No. of country spirit shop. | Area per shop (in Sq. miles). | Population served per shop. |
|------------|-----------------------------------|-------------------------------------|-----------------------------------|
| Madras ... | 6,042 | 24 | 7,004 |
| Bombay ... | 1,631 | 48 | 9,816 |
| Sind ... | 126 | 275 | 16,024 |
| Bengal ... | 979 | 78 | 47,696 |
| U. P. ... | 2,615 | 41 | 17,343 |
| Punjab ... | 517 | 186 | 40,153 |

The inference to be drawn from these figures is clear; that the higher excise revenue of Madras and Bombay, specially of the former, is due to more widespread addiction to drinking habit among the masses than in this province. It is pertinent to our

present enquiry to note that, circumstanced as provinces are to-day, Bengal is deprived of $3\frac{1}{4}$ crores and about $1\frac{3}{4}$ crores of revenue in comparison with Madras and Bombay respectively under this head, which if available might have been diverted towards the economic development of the province.

9. We now turn to another aspect of the problem. In the previous paragraphs an endeavour has been made to indicate the special character of the financial weakness of the province of Bengal under the existing financial arrangement. But in any estimate of the financial needs of the province, we must as well take into account the undischarged responsibility of the province in respect of expenditure which it should have incurred, and also in respect of special recurring expenditure which it has already been meeting. We recognise, however, that from one point of view, there is no definable limit of potential responsibility for expenditure of a government. Every Indian province, economically speaking, is at a low ebb; the demand for development is clamant with regard to each one of them. But we have taken the view that apart from a general need for development of all the provinces, the financial requirements of which cannot be estimated on a common denominator, there are specific directions in which the administration of this province has suffered comparatively to other provinces for lack of funds.

10. Turning first to the special expenditure liability which the province is carrying at present, reference may be made to administration of the city of Calcutta. With the exception of Bombay which has under its administrative charge the city of Bombay, there is no other province which is saddled with the administration of a city of such an area or population. It will be readily conceded that concentration of a population of well over a million in a city brings into being administrative problems of a specially expensive character. According to the budget estimates of 1929-30 the cost of Police administration of Calcutta was alone put at 33 lakhs of rupees; nor is policing the only item of expenditure of special character in the administration of such a city. The administration of justice and jails are two of the other important charges. We have not found in a readily available form relevant data to ascertain the special financial liability for expenditure under these heads for the administration of Calcutta, but taking into account the cost of policing in an ordinary district town and taking further into account the special expenditure for administration of jails and justice for the city, we are generally of opinion that it is safe

to assume that the administration of Calcutta entails annually a *special charge* of not less than 50 lakhs of rupees. As we have already expressed the view, we do not consider that any province with the exception of Bombay has to bear a financial responsibility of this size for the administration of a single city within its local jurisdiction.

11. It may be generally assumed that larger the number of towns there are in a province, the more expensive will its civil administration be. We do not consider we need argue at length to bring home this proposition. Judging by this criterion again, it appears that Bengal is in an unfortunate position, relieved only by the worst position of Madras in this respect, of having to bear the administrative expenditure of a far larger number of towns than any other province. The Census Report does not distinguish between towns and villages; but for all practical purposes it may be assumed that a locality which has a population of over ten thousand is more often than not, a town. The following table shows the number of towns and villages of large size in each of the major provinces.

TABLE NO. VIII.

Number of towns and villages in each province with a population of 10,000 and over based on the census of 1921.

| | | | | |
|---------|-----|-----|-----|-----|
| Madras | ... | ... | ... | 172 |
| Bombay | ... | ... | ... | 77 |
| Bengal | ... | ... | ... | 115 |
| U. P. | ... | ... | ... | 85 |
| Punjab | ... | ... | ... | 61 |
| B. & O. | ... | ... | ... | 42 |

So far as our information goes, there is only one village in Bengal which has a population of over 10,000. The large number of populous localities in the Province of Madras is presumably due to the presence within its limits of a number of thickly populated rural areas. In any event, the statistics establish our conclusion that the expenditure, which Bengal has to bear for administration of towns, is the highest of all the provinces with the only possible exception of the province of Madras.

12. From an examination of the present special liability of expenditure we now pass on to the field of unfulfilled liability of special expenditure. Here the most outstanding instance of administrative failure is with regard to primary education. The Hartog Committee (Educational Auxiliary Committee of the Simon Commission) points out that based on the figures of 1927 Bengal stands third in point of proportion of pupils in primary schools to the total number of children of school-going age in the province. This proportion percentage which is 59 and 17 with regard to boys and girls respectively in the province of Madras are 45 and 13 in Bengal. The corresponding figure of other provinces are lower, the lowest being of U. P. with the percentage at 30 and 3 regarding boys and girls respectively. But the striking fact is that though Bengal is fairly holding its own point of percentage of pupils in the schools, other provinces are fast making up their leeway or going ahead in comparison with Bengal. The following figures will be read with interest in this connection.

TABLE No. IX.

Percentage of increase of total number of pupils in primary schools between the years 1917 to 1927.

| Province. | Percentage of increase in the period. |
|-----------|---------------------------------------|
| Madras | 58.8 |
| Bombay | 51.0 |
| Bengal | 23.4 |
| U. P. | 59.0 |
| Punjab | 158.0 |
| B. & O. | 33.6 |
| C. P. | 12.2 |
| Assam | 20.3 |

The only two provinces whose progress is slower than that of Bengal are the two minor provinces of C. P. and Assam.

But more regrettable than the pace of advance of primary education in this province is the miserable financial administration of this subject. The cause of primary education is suffering indescribably in a province where higher education is thought to have made a very vast progress. In 1927 there were 17 lakhs of boys and girls in primary schools in Bengal, but the total amount of

expenditure per head of the pupil worked out lowest in this province. The figures of total number of pupils in the primary schools and the aggregate expenditure on them are set out below.

TABLE NO. X.

Particulars of aggregate pupils and aggregate expenditure in various provinces as in 1927.

| Province. | No. of pupils in primary schools (in lakhs). | Aggregate expenditure on primary schools (in lakhs of rupees). |
|--------------------|--|--|
| Madras ... | ... 22 | 170 |
| Bombay ... | ... 9 | 198 |
| Bengal ... | ... 17 | 67 |
| U. P. ... | ... 10 | 84 |
| Punjab ... | ... 4 | 42 |
| Bihar & Orissa ... | ... 9 | 55 |
| C. P. ... | ... 2 | 32 |
| Assam ... | ... 2 | 11 |

It is easy to realise how the inadequate expenditure *per capita* has reached on the quality of primary education in this province. It is true that bulk of the funds for primary education in each province is provided by the local bodies, namely, the District Boards and the Municipalities, but even if allowance be made for the contribution of the local bodies to primary education, the net Government contribution under this head in Bengal does not work out satisfactorily in relation to other provinces. In 1928-29 for instance, the contribution of local bodies to education, mostly to the primary education, was 64 lakhs in Madras, 68 lakhs in Bombay, 24 lakhs in Bengal, 45 lakhs in U. P. and 41 lakhs in the Punjab. Assuming that almost identical figures were contributed in 1927 by the local bodies in these provinces, it will be seen on reference to Table X above that the Government's financial contribution to primary education was lowest in Bengal both in aggregate as also *per capita* among all the major provinces.

In presenting this picture of educational expenditure in Bengal we have deliberately refrained from taking into account the recently passed Bengal Rural Primary Education Bill. In the first place, it is still an open question when the provisions of the Act will be given effect to. Secondly, even if a beginning be made of

introducing compulsory primary education, it may be taken for granted that the scheme will be introduced on purely local basis and as such, any intensive attempt at prompting compulsory primary education will not materially affect the picture here presented of the province as a whole, at least for some years to come.

13. Another field next to education where increased expenditure has been overdue in Bengal is public health. Here again, we have little difficulty in recognising that sanitary conditions in rural areas in all the provinces require to be considerably improved, but the point that we desire to make is that sanitary conditions, as they are to-day in various provinces, are worst in this province. According to the report of the Sanitary Commissioner, the death rate per thousand in 1927 from Malaria in Bengal was 17.0 against 7.0 in Madras and 9.7 in Bombay; but a more correct picture as to the state of public health of each province is probably furnished by the total figures of death for any particular year irrespective of death from any specified disease. Official figures would seem to prove that infantile death, that is to say, death of children of ages between 1 to 5 is low in Bengal. We ascribe this fact to the improved mother craft which has been associated with a larger spread of education among middle class women in this province in comparison with the corresponding position in such provinces as the Punjab, U. P., Bihar or even Bombay. But the statistics of death of persons over 5 years of age reveal a completely different picture. It shows that death rate is highest in the province of Bengal with regard to persons of all age periods between 5 to 50. The following table of death rates establishes this view.

TABLE No. XI.

Death rate per thousand in each province in the year 1927 according to the various age periods.

| Province. | Age period 5 to 10 | | Age period 10 to 15 | | Age period 15 to 20 | |
|------------|-----------------------|---------|------------------------|---------|------------------------|---------|
| | Male. | Female. | Male. | Female. | Male. | Female. |
| I Madras | 8 | 8 | 5 | 5 | 8 | 11 |
| II Bombay | 8 | 9 | 6 | 7 | 8 | 12 |
| III Bengal | 13 | 11 | 9 | 10 | 13 | 17 |
| IV U. P. | 7 | 7 | 6 | 6 | 7 | 9 |
| V Punjab | 10 | 11 | 10 | 13 | 15 | 18 |
| VI B. & O. | 11 | 9 | 8 | 7 | 10 | 10 |

| Province. | Age period 20 to 30 | | Age period 30 to 40 | | Age period 40 to 50 | |
|-----------|------------------------|---------|------------------------|---------|------------------------|---------|
| | Male. | Female. | Male. | Female. | Male. | Female. |
| | I | 10 | 11 | 12 | 12 | 15 | 14 |
| II | 9 | 12 | 12 | 13 | 19 | 15 |
| III | 15 | 19 | 17 | 19 | 22 | 21 |
| IV | 9 | 11 | 12 | 12 | 16 | 13 |
| V | 12 | 13 | 14 | 16 | 21 | 20 |
| VI | 14 | 13 | 16 | 13 | 19 | 15 |

It would be relevant to the present discussion on the sanitary condition of Bengal to point out that in all likelihood a large scheme of irrigation will have to form part of any programme of improvement in this direction. An eminent authority on the subject of irrigation lecturing in Calcutta in 1927 pointed out how an extended scheme of irrigation in this province is very intimately connected with the improvement of public health in this province. We do not intend to go further into this matter, as we believe public opinion is generally convinced as to the need for a new programme of irrigation for West Bengal in the interest of public health of this part of the province. We only set forth below the figures of expenditure incurred by each of the provincial Governments on irrigation in the year 1928-29.

TABLE NO. XII.

Expenditure on Irrigation by various provincial Governments in the year 1928-29.

| Provinces. | • | | | Figures in crores of rupees. |
|------------|-----|-----|-----|---------------------------------|
| Madras | ... | ... | ... | 1.05 |
| Bombay | ... | ... | ... | .89 |
| Bengal | ... | ... | ... | .36 |
| U. P. | ... | ... | ... | 1.04 |
| Punjab | ... | ... | ... | 1.50 |

14. The financial position of Bengal which we have attempted to indicate in the previous paragraphs may be summed up as follows: Bengal under the present arrangement has the lowest of spending power *per capita* with the exception of one province among all the Governor's Provinces; identically low is the relatively spending power *per capita* taking the nation-building services into account. This weakness in Bengal's financial position is mainly attributable to her low land revenue which is not likely

Summary of the present position.

to make a better contribution to the provincial exchequer even if the present system of land settlement be repealed; secondly, it is due to the low earning of the province from Irrigation operations; and thirdly, the financial leeway is attributable to the province's excise revenue which is much higher at least in two of the financially more solvent provinces. This picture is distressing enough but assumes further gravity from the two following facts; Bengal has to bear exceptional administrative charges from the presence within its territorial limits of Calcutta and a larger number of populous towns than there are in any other province, the only exception with regard to the first statement being in the case of Bombay and with regard to the second statement in the case of Madras. In two essential respects Bengal's financial position is rendered almost sordid, namely, her expenditure in the field of primary education and obviously unfulfilled responsibility with regard to improvement of sanitation, as borne out by the figures of comparative death rate.

All these facts provide, in our view, sufficient justification for our holding that Bengal's financial position is exceptional among all the major if not all the Governor's Provinces in India .

15. We are aware that the Simon Commission, pursuant to the Report of their Financial Assessor, have made important recommendations for augmentation of the resources of the provincial government. We will briefly examine here these recommendations and state our own conclusions about them. In the first place, Sir Walter Layton, the Financial Assessor to the Commission has suggested the centralisation of all commercial stamp, the loss from the revenue being proposed to be set off by an excise duty on imported foreign liquor, the import duty with regard to which is to be limited by the Government of India to 30% *ad valorem*. We observe that according to the calculation made by the Government of Bengal this transfer of resources between the provinces and the centre will result in a loss of 17¼ lakhs of rupees in the case of Bengal, the revenue from commercial stamp being estimated to yield 41 lakhs and the proposed additional excise duty 26¾ lakhs. On purely financial grounds the recommendation would affect the province adversely. In the next place, Sir Walter Layton suggests a tax on agricultural income in order to benefit the provinces. The levy of such a tax involves large issues of social policy and we consider it clearly indiscreet to assume its levy for granted. Further, we would point out as the Taxation Enquiry Committee clearly recognised, that so far as the province of Bengal is concerned, it is a mistake to reckon on a

Remedy suggested under
the Layton Scheme—
Agricultural Income-tax.

large revenue from this source owing to existence of Permanent Settlement. A calculation of rent paid by the ryot at a flat rate might reveal a large margin between the aggregate rent paid by the ryot and the aggregate amount paid as land revenue by the estate-holders. According to the Land Revenue Administration Report of 1918-19 this margin was put at 10 crores of rupees. Mr. W. H. Thompson in his Report on the census of Bengal in 1921 roughly estimated it at about the same figure. But it is important to remember that whatever the aggregate amount may be, which represents the income of the rent receivers in this province, it is shared by not less than 20 to 25 thousand persons comprised of estate-holders and the numerous tenure-holders under them. The enormous sub-infeudation of land in Bengal to which we made reference before has the effect of reducing the income per head of the rent receivers. According to Mr. Thompson's figure, the average income of a family of rent receivers without deducting their share of the revenue payable to the superior landlord or Government is Rs. 620/- a year. Clearly the scope of raising a large revenue by taxing agricultural income in this province is far more limited than is generally presumed. The question, however, is one which has to be approached purely from the stand-point of economic policy and we accordingly decline to treat it as a sure prospective source of large revenue for a provincial government in future.

16. Another recommendation of Sir Walter Layton designed to increase the provincial resources is the levy of a new country-wide excise duty on tobacco and matches, the
 National excise. proceeds of which together with the yield of the existing salt and opium duties are proposed to be distributed among the various provinces according to population. Rightly or wrongly, public opinion is acutely hostile to the present salt duty, and it is difficult to say if its future continuance can be reckoned on with any certainty. Assuming even that the salt duty is continued and the new excise duties are levied, it is a doubtful point whether under the federal constitution, which is generally being envisaged for the future, a system of national excise can be made to yield revenue for the provinces. These national excises were no doubt proposed to be levied centrally by Sir Walter Layton but the proposal was for all practical purposes conditioned by the special composition of a federal assembly which the Simon Commission recommended. Should a real federal principle be accepted and the lower House of the Central Government be organised not as delegates of particular provincial council as recommended by the Simon Commission, but as representatives of a national legislature elected on popular franchise, it is doubtful

if the financial needs of the provinces and the fiscal legislation by the central legislature can be maintained in co-ordination. Lastly, irrespective of the composition of the lower House of the Central Government, it is an inherent defect of Sir Walter Layton's proposal, (which is in effect a provincial revenue being levied and raised by the centre) that some provinces might be over-taxed in the interest of others. On constitutional grounds it seems difficult for the provinces to count on a source of revenue which owing to its intrinsic nature they cannot administer and therefore, can neither levy nor collect.

17. Still another new tax suggested as a provincial revenue by Sir Walter Layton is a terminal tax collected as a surcharge to railway freight. Levied on a general scale, as suggested by Sir Walter Layton, the tax was estimated to yield an aggregate revenue of 8 crores of rupees for the whole of India and as the proposal was that each province was to benefit from the entire collections within its local jurisdiction, Bengal might be expected to profit enormously from such a tax. Unfortunately, the tax as a general surcharge has not received the support either of the Government of India or the Government of Bengal. A general surcharge to all freights would have the simple effect of adding to the cost of transport with the further result that railway revenue would be affected and internal trade generally would suffer. The Government of Bengal in fact in their Despatch on the Simon Commission go so far as to remark that they are of opinion that the proposal is hardly within the bounds of practical politics. Such an opinion is in our view wholly exaggerated. A terminal tax is feasible to levy and needs hardly be characterised as outside the bounds of practical politics. But having regard to the economic effects of such a tax we are reluctant to treat it as a revenue yielding proposition of any importance. We are at the same time strongly insistent in our view that such a tax should be recognised as a source of provincial revenue and an unreserved provincial subject. The situation that we envisage is this, that though it would be economically unsound for a province to levy a general surcharge to all freights there are particular commodities which might well bear such a tax; and there is no reason why a needy province should not take advantage of such a tax. The Government of India clearly recognise the identical circumstances under which a terminal tax would be fully justified for a provincial government to levy, but it is their suggestion that "definite powers of control should be reserved to the Government of India in order to safeguard sources of central revenue and to prevent the imposition of discriminatory taxation which may involve breach of international treaties or agreement". We are strongly

opposed to any such reservation of powers in the hands of Central Government; nor can such reservation be possible under a federal system of government. Should a federation be brought into being, the chances of conflict between the centre and the provinces is always incipient in the working of the governments. For adjustments of such conflicts constitutional machinery will have to be provided, but we are strongly of opinion that the control over terminal tax proposed by the Government of India should not rest with the federal authority in future. Our objection is based on this vital consideration. We are keen on a terminal tax being provincial subject and a source of provincial revenue in order to equip the province with an instrument of its economic policy. How precisely the need for exercise of such an instrument may arise will be discussed later in this report. Meanwhile, we would remark that while we welcome the terminal tax as a new addition to the sources of provincial revenue, we do not consider that we can treat it as a prospective source of any large revenue for any of the provinces. We are in entire agreement with the suggestion of Sir Walter Layton that the tax should be on the incoming traffic and not on the outgoing one.

18. There remains for examination the recommendation of Sir Walter Layton that each province should receive 50% of the personal income tax collected in each province. We welcome this recommendation as a very valuable one. But we do not consider it goes the whole way. It is our emphatic view that the entire tax should be provincialised. In other words, we hold that with the exception of super-tax and the tax assessed to the undistributed profits of companies and to the income of absent earners, the entire income tax should be a source of revenue for each province of collection. Having regard to the fact that the national excises are not likely to benefit the provinces for reasons of constitutional difficulty and also the fact that a general terminal tax cannot be reckoned on at all, we do not consider that any case needs be established for completely making over the personal income tax to the provinces. The provinces are desperately in need of new funds; and as these cannot be made to come through other sources indicated by Sir Walter Layton, it is obvious that fullest advantage must be taken of the only channel through which they might flow. On ground of fiscal principle the proposal cannot be open to any objection either, as Sir Walter Layton himself conceded that 50% of the personal income tax should be made over to the province. So far as Bengal is concerned, the provincialisation of personal income tax seems to be one of the best methods by which a large new revenue may be raised. In 1927-28 no less

than 174 lakhs of personal income tax was collected in this province. In the two following years the figure rose to 192 and 195 lakhs respectively. The tax is one of much potentiality. There is every likelihood of its steady expansion; in any event, a revenue of two crores of rupees may be looked for with certainty from this source in future years, unless there is a marked set-back in the position of trades and industries which have been built up within the province.

We cannot sufficiently emphasise the need for provincialisation of personal income tax. We have already subjected the recommendation of Sir Walter Layton to a close examination; we have pointed out by a process of elimination that the personal income tax is the only source from which any thing like a substantial revenue can be made over to the provinces in addition to their existing resources. The distressing comment on the present position of Bengal's finances is this, that there is maximum production of wealth within its boundary, yet the spending power *per capita* of its Government is lowest but one among all the Governor's provinces. To substantiate our observation that the production of wealth is the highest in this province, we set out below the following statistics of income tax demand in 1928-29.

TABLE NO. XIII.

The amounts of income tax demanded in various provinces in 1928-29; (in crores of rupees).

| | | | | |
|-----------|-----|-----|-----|------|
| Province. | | | | |
| Madras | ... | ... | ... | 1.38 |
| Bombay | ... | ... | ... | 3.09 |
| Bengal | ... | ... | ... | 4.11 |
| U. P. | ... | ... | ... | .81 |
| Punjab | ... | ... | ... | .66 |
| B. & O. | ... | ... | ... | .48 |

It will probably be argued that the high assessment in Bengal does not represent entirely the economic enterprise of the province of Bengal. Most of the mining enterprises in Bihar and most of the tea gardens in Assam have their head offices in Calcutta and though the companies pay their income tax in the province of Bengal, they represent in reality the economic wealth of provinces other than Bengal. But even allowing for such necessary

adjustments it will be obvious that the collection of income tax is the highest in this province.

To return to the main thesis of our argument that Bengal's spending power *per capita* is sharply disproportionate to its pre-eminent position among the provinces in point of wealth-producing activity. The present unfortunate position has been entirely due to the fact that the immigrant elements to this province who are very largely engaged in the wealth-producing activity within the province do not make any contribution to the provincial exchequer. The chief among these elements are the Europeans, the merchants hailing from Bombay and the Marwari traders who have penetrated even to the remote villages of the province. With this aspect of the problem we shall deal elsewhere. For our present purpose it is enough to point out that of the three main items of provincial revenue, land revenue, excise and stamp, none of these immigrant elements make any contribution except with regard to the proceeds of commercial stamp in connection with their various trading activity. It is essential in our view that in the interest of improvement of the financial position of this province, these immigrant elements should be made to contribute their share to the provincial treasury. It is the proceeds of income tax to which this immigrant trading community is liable which can substantially augment the resources of the province. We labour this point at length not with a view to establishing the principle of provincialisation of personal income tax; for as we have already remarked, the principle has been admitted by Sir Walter Layton himself. We only urge the complete provincialisation of this tax on the ground of financial poverty of the province. Incidentally, we analyse the real inwardness of this poverty and point out that our proposal will go to attack the cause of the present poverty radically.

The question requires to be carefully examined whether under the proposal we have made above the tax on income shall be levied by the central government or the provinces and how under either event, the tax should be administered. Should the future constitution of India be placed on a federal basis, we foresee constitutional difficulty in the central government levying the tax which is to benefit the provinces. On the other hand, apart from an objection based on a possible lack of uniformity in rates as among the provinces, the revenue of the central government is likely to be affected by the decision of the provincial legislature with regard to rates of taxes. It must be clearly recognised that personal income tax is only a composite resultant tax paid by each individual according to the rates at which the various kinds of income, such as salaries, profits, interests and securities etc., are taxed. The

central government will always remain interested in the rates at which the various classes of income are fixed. For although most incomes are ultimately personal, there are two non-personal incomes, namely undistributed profit of a company and the income earned by investors abroad. The income tax from these two sources will, therefore, ever fall to the share of the centre. The rate of income tax might moreover affect the yield from super-tax which is designed entirely to benefit the central exchequer. The balance of argument with regard to the levying authority would seem to lie in entrusting the power to the centre. A possible alternative is to allow the provinces to levy the rate subject to certain maximum and minimum laid down in statutory rules. With regard to administration, we anticipate that each provincial government must employ its own collecting staff, but a liaison will have to be ensured between the provincial and central collecting agency in each province.

19. The only factor of improvement which we have so far been able to suggest for the depressed finances of this province is the complete provincialisation of personal income tax. This new tax will, as we have seen, bring to the coffers of the province a sum of two crores, only, but it will be observed on a reference to Table I (Vide page 4) that an addition of two crores to the revenue of this province will not bring the resources of the province on a par with any other province except probably U. P. The Government of Bengal, in course of their survey of the Layton proposals pointedly remarked that a new revenue of 219 lakhs "falls far short of that which they consider essential for the proper development of the province." We deliberately quote the view of the Bengal Government in order to prove that the need for new revenue that we have in view is by no means exaggerated. No proposal has hitherto been put forward that the provinces should surrender any of their existing source of revenue except the minor adjustment between the commercial stamp and excise duty referred to above; nor do we believe the possibility of any such proposal needs be seriously considered. This being the position we may take it that the existing spending power which the various provinces enjoy at present will certainly be maintained and there is every chance of its augmentation. Assuming even, however, that Bombay retains its present spending power over Rs. 8/- per head, the Punjab over Rs. 5/- per head and Madras over Rs. 4/- per head and even C. P. and Assam a little less than Rs. 4/- per head, it would be greatest injustice to Bengal if new revenue cannot be added to the financial resources of the province to raise its spending power at least to the level of the province of Madras. The position of Bombay is exceptionally

favourable. With a low population it combines all the benefits of a large acreage of cultivable land and a large measure of industrialisation than what any other province has so far attained. Indeed, should personal income tax be provincialised its position will be still more exceptionally improved in relation to other provinces. But while we do not envy the western presidency, we must have our resources augmented through other channels.

One such field of taxation is provided by raw jute and jute manufacture. The white fibre is a natural monopoly of Bengal. Without going into the economics of jute trade and jute industry, we may safely assume that it is possible to make jute yield a large revenue to this province. As a matter of fact, since 1916 an export duty has been levied on raw jute and jute manufactures. In the year 1928-29, the jute export duty yielded an aggregate amount of 4 crores of rupees which under the existing Devolution Rules is creditable to the central exchequer. Public opinion in Bengal was deeply stirred some years back over the loss of a big revenue which might have belonged to the province of its origin. We have carefully considered if the jute export duty should be provincialised. On constitutional grounds we are fully alive to the anomaly which would emerge from such a proposal. Custom by all admission should be made a central subject. Even if jute export duty is to be recognised as a provincial revenue, it follows that the duty itself must be levied and administered by the central government. On a careful examination, however, it will be found impossible to lend countenance to such an arrangement. No province can look forward to a central legislature to vote a tax from year to year in order to suit the needs of the province. Indeed, no guarantee can be forthcoming from a legislature to vote a tax which, if not voted, will not affect the financial administration of the field of government for which it is responsible. On the other hand, provincial jealousy and provincial animosity may quite conceivably be at work making for the denial to one province an exclusive source of large revenue. The only alternative, therefore, which is left open in the case of Bengal to reap the financial benefit of a jute export duty is to claim for the provincial legislature the right to levy the tax. We do not consider it necessary at this stage to go into the details of alternative methods of taxation which are open to a provincial government to have recourse to. It may be stated here that in the year 1929-30, the Calcutta Improvement Trust earned a sum of Rs. 14,31,000/- from raw jute arriving in rail to Calcutta destinations. All consignments of raw jute arriving at Howrah are also subject to a small cess in connection with the Howrah Improvement Scheme.

20. The conclusions that we have arrived at in our search for new revenue for the financial benefit of Bengal are that the personal income tax and the jute export duty ought to be completely provincialised. It is obvious that all the existing sources of provincial revenue must be left unaffected without any encroachment thereupon except the minor adjustment between the commercial stamp and excise on imported foreign liquor. We have not dealt with the constitutional side of the taxing powers but we have no hesitation in remarking that the Scheduled Taxes Rules must be repealed and that the taxing power of the provincial legislature in the field of taxation, recognised as provincial under the statute should be unhampered.

Summary of conclusions.

CHAPTER III.

BENGAL'S ECONOMIC FLIGHT.

21. We may now turn to determine what should be secured as a legitimate sphere of the policy of a provincial government in the economic interest of the province. But an examination of such field shall best be preceded by a general survey of the economic position of our province. An economic picture will serve to emphasise the value of the conclusions that we might reach in regard to the demarcation of an economic sphere in the field of provincial government.

22. The great bulk of the population in this province, as in any other Indian provinces is rural, being chiefly dependent on agriculture as their occupation. Even the casual student of Indian economic conditions is aware that the Indian agriculturist leads an economically hazardous life in constant grip of debt and with little or no surplus income. Such a broad fact is writ large as much on the rural life of Bengal as of other provinces. But there are agriculturists in every province who have some saving, however modest; it is this small margin of surplus income which is being increasingly drawn into the co-operative credit movement. The agricultural credit societies within the co-operative movement form now a definite feature of rural economy in every province, and we believe the deposit capital which the agricultural credit societies are

Surplus income of rural community in Bengal.

building up from year to year gives some indication of the general economic standing of the rural community in various provinces. Judged in the light of these figures it appears that the position of Bengal is deplorable. We set out below the relevant statistics.

TABLE XIV.

Showing the loans and deposits received by agricultural credit societies in various provinces.

| Province. | Loans and deposits from individual members, (Figures in thousand Rs.) in 1928-29. | No. of agricultural credit societies in 1927 (Figures in Thousand). | Deposits from individual members per society. |
|-------------|---|---|---|
| Madras ... | 2,521 | 1.2 | 200 |
| Bombay ... | 4,251 | 4.4 | 1,062 |
| Bengal ... | 1,026 | 16.4 | 64 |
| U. P. ... | 101 | 5.7 | 20 |
| Punjab ... | 6,230 | 15.2 | 415 |
| B. & O. ... | 293 | 7.9 | 43 |
| C. P. ... | 883 | 3.9 | 294 |
| Assam ... | 137 | 1.1 | 137 |

It will be observed that the deposit of the agricultural credit societies from individuals is only Rs. 64/- in Bengal against Rs. 1,062/- in Bombay and Rs. 415/- in the Punjab. The only two provinces in which the average deposit per society from individuals is lower than Bengal are Bihar and Orissa and U. P. It is significant, however, that in U. P. the number of societies up till 1927 was very low relative to its total population. On the other hand, it is remarkable that in number of societies Bengal occupies the highest position not only in an absolute sense but also relatively to its population compared with such province as Bombay where the average deposit per society is the highest. The conclusion is clear that though the co-operative movement has developed most intensively in the province of Bengal the average deposit of an agricultural credit society from individuals is very near the lowest. Such a fact can only be explained with reference to the position that the rural agricultural class in this province is poorer relatively to the corresponding class of other provinces.

23. The conclusion arrived at from the statistics of deposit of agricultural credit societies is easy to explain when the problem is approached from the pressure on land in this province in comparison with the same economic phenomenon in other provinces. It is an obvious conclusion to draw that the greater is the pressure on land in a province the poorer is its population, provided the same percentage of it is in every province dependent on agriculture for their livelihood. We shall be justified to neglect this reservation in any examination for all practical purposes of the comparative pressure on land in various provinces as indicative of their general economic position. Basing our conclusion on the figures of acreage of land cultivated and uncultivated in various provinces in 1927 and their population according to 1921 census we arrive at the following statistical results.

TABLE NO. XV.

Showing the pressure on land in various provinces, acreage figure being as in 1927.

| Province. | | | | Population supported by each acre of land. |
|-----------|-----|-----|-----|---|
| Madras | ... | ... | ... | .9 |
| Bombay | ... | ... | ... | .4 |
| Bengal | ... | ... | ... | 1.6 |
| U. P. | ... | ... | ... | .9 |
| Punjab | ... | ... | ... | .5 |
| B. & O. | ... | ... | ... | 1.0 |
| C. P. | ... | ... | ... | .3 |
| Assam | ... | ... | ... | .3 |

It will be seen that the pressure on land is highest in Bengal and assuming, as we feel we are justified to do, that the pressure on land and the economic standing of the population varies inversely, it appears to us that the agricultural Bengal is the poorest among the agricultural communities of all the provinces.

24. The statistics that we have adduced above are, if anything, only illustrative of the economic position of the poorer agricultural classes. It is difficult to speak with any confidence as regards the urban classes in this province. But from what statistics can be brought forward with regard to them, the conclusion seems to be equally justified that the urban classes fare no better

than the rural agriculturists of Bengal in a comparison of the general economic standing of the various provinces. In the first place, reference may be made to the total income earned by various provinces from interest on government securities. The following are the relative statistics with regard to the year 1928-29.

TABLE No. XVI.

Showing the income from Government Security on which tax was collected in various provinces in the year 1928-29.

| Province. | | | | In lakhs of Rs. |
|-----------|-----|-----|-----|-----------------|
| Madras | ... | ... | ... | 28 |
| Bombay | ... | ... | ... | 338 |
| Bengal | ... | ... | ... | 8 |
| U. P. | ... | ... | ... | 23 |
| Punjab | ... | ... | ... | 32 |
| B. & O. | ... | ... | ... | 5 |
| C. P. | ... | ... | ... | 4 |

We lay much stress on the significance of these statistics as an economic indicator of the various provinces, for, next to land the guilt-edge government securities is the channel in which the surplus income of the upper middle class finds investment. The position of Bombay is of course exceptional. The presence of an active guilt-edge section in the stock market accounts for an extra-ordinary large size of the holding of government securities. A good part of it is of speculative interest. Even making allowance for the special conditions of Bombay, the low income from government securities in Bengal is only accountable by the lower average surplus income held by the upper middle classes in this province. It is true that in every province a percentage of the total holding is in the hands of financial institutions. But in this respect the percentage will be highest in Bengal or at any rate would not be lower in this province than in any other province.

25. The same indication of the relative poverty of Bengal in economic scale of provinces is afforded by the figures of income tax of undivided Hindu families assessed to income tax in various provinces. The statistics are quoted below.

Total income of undivided Hindu families assessed to income tax.

in economic scale of provinces is afforded by the figures of income tax of undivided Hindu families assessed to income tax in various

TABLE NO. XVII.

Showing the aggregate amount of income of undivided Hindu families on which income tax was collected in various provinces in 1929-30.

| Provinces. | Figures in Lakhs of Rs. | | |
|------------|-------------------------|-----|-----|
| Madras | ... | ... | 647 |
| Bombay | ... | ... | 507 |
| Bengal | ... | ... | 397 |
| U. P. | ... | ... | 603 |
| Punjab | ... | ... | 504 |
| B. & O. | ... | ... | 400 |
| C. P. | ... | ... | 353 |

The only province with an aggregate income of undivided Hindu families assessed to income tax lower than that of Bengal is C. P. While the aggregate income from this source is only 25 p.c. lower in C. P., the population of the latter is more than 75 p.c. lower than that of the former. Further comment is hardly needed.

26. Yet the income tax returns are generally supposed to falsify this picture of economic position of Bengal. According to the figures for the official year 1929-30, the highest amount of income assessed to income tax was collected in the province of Bengal being 55 crores against 53 crores in Bombay, 26 crores in Madras, 15 crores in U. P. and 17 in the Punjab. In point of number of assesseees Bengal occupies a place next only to Bombay, the total number of assesseees in 1929-30 being 73,000 in Bombay, 47,000 in Bengal, 42,000 in Madras and 25,000 each in the provinces of U. P. and the Punjab. It might therefore appear at a superficial glance at these figures that Bengal's economic position is not as low as the statistics given in the previous paragraphs of this chapter would seem to reveal. We have taken some pains to scrutinise the income tax returns. In the first place, we observe that in the total number of assesseees in each province is included a number of those assesseees who are taxed at the source. These assesseees chiefly represent the companies and registered firms. Obviously in any estimate of persons paying income tax in each province the number of such non-personal assesseees should be deducted. Secondly, the European population is distributed over the provinces in widely varying numbers. We think it is justifiable to assume that almost every European worker, in the sense in which the word "worker" has been used in the Census Report and excluding those who are members of the public force, has

an income well above the minimum assessable limit. If the number of persons paying income tax in each province is to be treated as any measure of the economic position of the provinces concerned, clearly it is necessary to make a further deduction of the European workers in each province from the total number of assesses paying income tax in the province of their residence. The following statistical data is arrived at after an adjustment is made on account of these two deductions.

TABLE NO. XVIII.

Showing the number of non-European persons paying income tax in each province, figures based on Income tax return of 1929-30.

| Province. | No. of assesses less the 'unclassified assesses' less the European workers resident in each province. |
|----------------|---|
| Madras | 37,220 |
| Bombay | 63,264 |
| Bengal | 33,196 |
| U. P. | 18,817 |
| Punjab | 21,819 |
| B. & O. | 11,413 |
| C. P. | 12,676 |
| Assam | 3,791 |

It will be noticed that the number of Indians paying income tax in Bengal is largely exceeded by the corresponding number in Bombay and is also exceeded by the corresponding number in Madras. Even the Punjab with a population of less than half of Bengal and C. P. with a population of far less than one-third of Bengal presents a picture far more favourable than that of Bengal, judged in the light of the ratio between the assesses and the population. In other words while the position of Bombay and Madras is better than that of Bengal in an absolute sense, the position of the Punjab and C. P. is better than that of Bengal relatively to the population of each of these provinces. It is only the United Provinces, Bihar and Orissa and the minor province of Assam which falls below the standard of Bengal both in an absolute comparison or in a relative test based on population.

27. But the real picture of the economic position of the province, judged with reference to the figures of income tax, remains to be unfolded until further adjustments are made in the number of assesseees.

Non-Bengalee element
in economic picture of
Bengal.

It is a common knowledge that in the domain of trade and industrial activity carried on in this province, the Indian share in them is largely contributed by Indians who, in the language of Census Report, have only temporarily migrated to this province. The Census Report of 1921 shows that 47,865 persons born in Rajputana Agency and 11,235 persons born in the Bombay Presidency were resident in the province of Bengal. Of the former not less than 12,507 born in Bikaner and 10,316 born in Jaypur were found in the city of Calcutta alone. The author of the Census Report pointedly remarks that there is a "clear indication that upcountry mercantile classes are taking a larger and larger part of the city's trade and it seems that they are doing the same outside the city also." He also attributes the increase in the number of immigrants into the province from Bombay as due to the increasing influx of the mercantile classes hailing from that province. Of the total immigrants of 58,000 from Rajputana and Bombay, we presume that there are at least 11,000 workers (allowing a family unit of near about 5 persons) earning their livelihood in this province. In the absence of any data we venture to assume that not less than 7,000 or 66% of the workers have an assessible income and pay income tax. The percentage would not be considered high in view of the fact that most of the immigrants from Rajputana and Bombay are engaged in the lucrative occupation of trade and business, manufacture or industry. Read with the total figure of assesseees arrived at for the province of Bengal in the previous paragraph, we are left to assume that not more than 26,000 persons born in this province pay income tax within the province.

28. Further examination of the tax collected in this province throws an interesting light on the economic poverty of the province.

Of the 55 crores of rupees which was assessed to income tax in Bengal in the year 1929-30, no less than 26 crores represent the income of limited companies and registered firms, a little over 22 crores being the share of companies and a little less than 4 crores being the share of registered firms. Of the total tax of 2 crores 45 lakhs assessed to this income, no less than 2 crores 20 lakhs is assessed in Calcutta alone. Making even a very liberal allowance for the accumulated amount of tax paid by small companies and registered firms, we assume that of the 2 crores 20 lakhs assessed to the profits of companies and registered firms

Further examination of
the tax collected.

in Calcutta not less than 2 crores is contributed by the concerns financed overwhelmingly and managed exclusively by European capital. Even, therefore, if we are to hold that the entire profits of foreign commercial and industrial exploitation is assessed in Calcutta, it would follow that of the 2 crores 45 lakhs paid as tax by companies and registered firms in Bengal roughly four-fifths according to our estimate is contributed by the concerns representing foreign commercial exploitation. In other words, we may roughly estimate that of the total income of 26 crores which is the share of income of limited companies and registered firms assessed to income tax in this province, no less than 20 crores of rupees represent the profits of foreign capital alone. Again, from what rough conclusions we have been able to make, it appears that another sum of 4 crores assessed to income tax in this province represent the salaries of the European employees of the commercial firms of Calcutta. Such a figure seem to fit in eminently with the figures that we have been able to compile of the European workers (male only) engaged in trade and industries, planting and mining in the various provinces. The results are tabulated as under.

TABLE No. XIX.

Showing the number of European workers (male only) engaged in trade, industries, planting and mining in the various provinces based on the census report of 1921.

| | | | | |
|---------|-----|-----|-----|-------|
| Madras | ... | ... | ... | 807 |
| Bombay | ... | ... | ... | 1,206 |
| Bengal | ... | ... | ... | 4,558 |
| U. P. | ... | ... | ... | 673 |
| Punjab | ... | ... | ... | 537 |
| B. & O. | ... | ... | ... | 684 |
| C. P. | ... | ... | ... | 99 |
| Assam | ... | ... | ... | 1,144 |

The income of 4 crores divided among 4 thousand workers would leave an average income of 10,000/- a year which accords fully with our general knowledge and experience of the average income of the Europeans in this province engaged in the various fields of trade and commerce.

29. The statistics adduced in the last table serve to emphasise the well-known fact that Bengal is the most foreign exploited of Indian provinces. We made some attempt at assessing the share of Europeans, Bengalees and other Indians in the industrial activity of the province. But for want of sufficient time at our disposal and for paucity of information regarding ownership from a mere conventional description of the enterprises,

Foreign share in trade and commerce of the province.

we were compelled to give up such an attempt. The figures compiled on the subject in connection with the census of 1921 furnish some idea, though they do not distinguish between the ownership of Bengalees and other Indians. In the tea industry, the census report puts the garden under European ownership at 214 against 129 under Indian management. It is significant, however, that the Government report on large industrial establishments fixes the total number of tea gardens in Bengal in 1926 at 225. The total number of gardens according to the census report vastly exceeds the total number of gardens returned for Bengal in the report on industrial establishments. Our own conclusion is that a very large number of what was shown as Indian gardens in the census have gone into liquidation since the date of census computation. Whatever their number is, we presume, that not more than a small percentage of the total tea gardens in Bengal is to-day under Indian ownership. So far as our knowledge goes, the interest of Indian capitalists other than the Bengalee in the tea industry is not large. With regard to collieries, the census report shows 79 under European management and 61 under Indian. In the coal mining industry the number is very misleading. Of the 61 companies shown as under Indian ownership in 1921, a large number have ceased to work, and we presume not more than 66% of these collieries are working to-day. In any event, the Indian collieries are generally of a very small size in comparison with the European undertakings. In the Indian share of the coal industry, we estimate that a fairly large percentage of the capital is contributed by capitalists who do not belong to this province. In the jute textile industry there were 62 mills in 1921 according to the census return but their number has now risen to 89, there being 4 mills under Indian ownership. Of the latter again, only 1 is owned by a Bengalee company. In the cotton textile industry there are 14 mills according to the return of 1927 of which the 3 biggest are European owned, 3 represent Bengalee capital and the rest non-Bengalee Indian capital. There were 110 jute presses in 1927 in Bengal, out of which barring half-a-dozen the rest are European concerns or are owned by Indian capitalists other than Bengalees. A comparatively small industry marked by a large number of concerns in the province is the rice husking industry. The average capital invested in each of the rice mills would not exceed Rs. 50,000/-. There is little or no European capital in it but a very large number of the rice mills are owned by capitalists who do not belong to this province. There were, however, 106 chemical companies in 1927 of which we presume, a good proportion is owned by Bengalee capital. We do not think it necessary to lengthen the picture any further particularly as nothing more than approximate percentage figures are available to us.

CHAPTER IV.

THE ECONOMIC FIELD OF THE PROVINCE.

30. The survey of the economic position of Bengal, as roughly outlined in the previous chapter will enable us to formulate our recommendation of a constitutional or quasi-constitutional character with a view to the promotion of the best economic interest of the province. As already anticipated in framing the terms of our study, these recommendations fall into three divisions; firstly, those which define the economic subjects which should be recognised as constitutionally a legitimate field of provincial Government. Secondly, what reservation, if any, is to be made in the proposed Indo-British trade convention; and thirdly, what constitutional powers, if any, which the province may be in need of in order to safeguard its interest against trading or commercial aggression of other provinces.

31. In defining the economic sphere of what in our opinion should be the field of provincial Government, or in other words, what economic subjects from Bengal's point of view should be provincialised we need only refer here to those subjects which under the present devolution rules are central or are very largely so. We may emphasise here once again that so far as Bengal is concerned, its economic position is exceptionally grave. Surplus income of the rural agriculturists is the lowest in the province. Nor are there indications of a better state of economic soundness among the urban classes. What has been shown to be still worse is that despite numerous exploitations of the natural resources of this province such as represented by the jute, tea and coal industries and despite enormous wealth-producing activity in the province represented by the Clive Street, the children of the province themselves reap a small benefit and play an extremely insignificant part in them. These facts have to be carefully borne in view in judging what suggestions we now proceed to make. To sum up, the problem in Bengal is both of intensive development in fields that are unexplored as also of safeguarding of provincial interest in fields which are being too ruthlessly exploited with little benefit to the men of the province.

32. The incorporation of trading, financial and foreign companies is now a central subject under item 18 of the list of central subjects embodied in the Devolution Rules. The Nehru Committee also proposed this to be a subject on the central list. After much careful consideration we venture to think that this should be a subject which, faced as we are with

Economic sphere of provincial Government.

Incorporation of trading, financial & foreign companies.

facts in Bengal, should be borne on the provincial list. We do not consider that the subject should necessarily at the same time cease to be a central one. For, we recognise the obvious necessity that might arise for the central legislature or the central government to take action in this field. As, however, conditions are in Bengal as the most foreign-exploited province and as one in which the children of the province are being deprived of fruits of much of the present trading and commercial activity within its border, it is just possible that Bengal will have to take action in determining its own conditions of incorporation of trading, financial and foreign companies. It is hardly necessary to envisage how the situation may develop in future calling for action with reference to this particular constitutional power of the province. It will probably be sufficient to emphasise that without being discriminative, even a common obligation thrown on all companies for publicity of some of their affairs will be enough to keep public opinion alert as to the potentialities of any incipient danger.

33. With regard to regulation of banking and provident companies which like the subject just mentioned is now borne on the central list, we are equally insistent that under a new constitution it should be recognised as a concurrent field both for the provinces and the centre. Bengal in course of this century has built up an indigenous banking system of its own, as it will appear from the following statistics of incorporation of banking companies in various provinces.

TABLE NO. XX.
Showing the banking companies registered in various provinces in 1927-28.

| | | | | |
|---------|-----|-----|-----|-----|
| Madras | ... | ... | ... | 331 |
| Bombay | ... | ... | ... | 47 |
| Bengal | ... | ... | ... | 682 |
| U. P. | ... | ... | ... | 22 |
| Punjab | ... | ... | ... | 24 |
| B. & O. | ... | ... | ... | 16 |
| C. P. | ... | ... | ... | 5 |
| Assam | ... | ... | ... | 32 |

It will be seen that in Bengal has been registered the largest number of banking companies. This fact by no means indicates that Bengal is commercially more advanced than Bombay with only 47 banks registered within the province. The fact is that Bengal

has during the last three decades evolved a banking system outside the joint-stock commercial banks on the model of which most of the banks in other provinces excepting Madras have been established and are operating. The numerous banking institutions which have sprung up in this province are loan companies not only in almost every urban centres but also in numerous urbanised rural areas. With the exception of Jalpaiguri Bank which is very largely an institution for financing the tea industry and with one or two large-sized banks such as those in Faridpur and Khulna most of these banking institutions are of a non-industrial and non-commercial character. They are not either, as most of the Madras banks are, land mortgage institutions. On the whole, they cater to the credit needs of the lower and upper middle classes in urban areas, and the very growth of these institutions indicates how steadily even the urban classes of Bengal have been deteriorating economically. It will, therefore, be seen that banking problem presented by the establishment of numerous loan companies in this province is a specially provincial one. Lately there has been also a boom for floatation of provident companies. It is clear, therefore, that full freedom must be reserved for the province to take both legislative and administrative action with regard to these institutions.

34. Another subject to which in our opinion full control of the provinces must be secured is the inland waterways. Under the existing Devolution Rules, as also under the recommendation of the Nehru Committee, this subject is borne on the central list. We consider, however, that having regard to the important part which the inland river transport plays in the economic life of this province, the subject is one from which control of the provincial government cannot be divested. According to the figures of internal trade of Bengal for the year 1921, since when the later figures are not available, out of the total quantity of 508 million maunds of goods carried by river and rail into and from this province and as between Calcutta and the other internal parts of the province, no less than 100 million maunds were borne by river transport alone. Of this latter amount in our estimate based on general experience, no less than 75% in the minimum is borne by steamers, the remaining 25% being carried by country boats. These figures of volume of traffic do not, however, take into account the movements of trade as among different internal blocks of Bengal excluding Calcutta. It may be assumed that whatever exactly the size of this trade may be, it is relatively insignificant in comparison with the movements as between Calcutta and other parts of Bengal and inter-provincial movements. Omitting,

therefore, this part of the trade, it may be assumed that roughly 15% of the entire internal trade of Bengal is carried by steamers alone. We venture to think that this is an aspect of internal trade which is peculiar to this province and we suggest, therefore, that the subject be recognised as exclusively provincial. It might doubtless be argued that in point of river transport, the economic sphere of Bengal extends over a much wider area than what is included within its present territorial limits. We are perfectly aware of this fact, and while recommending that the internal waterways should be reserved as a provincial subject, we clearly foresee that the need will arise for the institution of a special machinery for concerted action in this field among the neighbouring provinces. We anticipate, for instance, that an inter-provincial River Transport Board consisting of the representatives of Governments of Bengal and Assam will have to be set up. But the fact that certain questions owing to physical limits of the provincial area cannot be fully dealt with without the aid of the authorities of the neighbouring provinces cannot be admitted as an argument for excluding a subject from the provincial sphere. The determining consideration is the measure of vital economic interest involved in the subject and the extent to which the centre as such is likely to feel interested in it. Proceeding on this principle, we are unhesitatingly of opinion that internal waterways must be treated as an exclusive field of the provincial governments.

35. In Chapter III of our report we have indicated how despite the assumed intense industrialisation of the province, our own people have been reaping only a very limited benefit of it. We may point out here in passing that even in regard to labour employed, the Bengalee element is much more limited than what is generally supposed to be the case. The census report of 1921 gives some significant figures in this connection. Of the industries, of which a survey was made, only 71,150 labourers were returned as men and women born in the province against 1,71,934 men and women born in other provinces. To pursue the line of our argument, industrial development is as urgently needed in this province as in other provinces, the present economic exploitation of the foreign capital in this province notwithstanding. It is our emphatic opinion, therefore, that the development of industries should be recognised as a provincial matter. Under the existing Devolution Rules, the subject is provincial except in so far as it may be reserved to the centre by rules framed by the Government of India. We are not aware of any such rules. But whatever may be the fact in this behalf, we are emphatic in our opinion that the province's scope of action in this field should not be hampered

by any restrictions placed by the central government. The point demands some careful examination as to whether the development of industries should be a concurrent or an exclusive field for the provinces. It is arguable that with regard to such industry, for instance, as the coal industry, the continuous location of which cuts across a provincial barrier, there may be obvious difficulty for a provincial government to take action either legislative or administrative. But we do not consider that such instances are many. On the whole, the balance of argument seems to lie in favour of the exclusive provincialisation of the subject. In the event, however, it be still considered that the door should be left open for the central government to initiate measures in this field we suggest that the subject may be treated as concurrent in point of legislation only, subject to the reservation that it shall not be operative in any province unless the central legislation is ratified by the provincial legislature. Such a provision as we make in the reservation formulated above is by no means a novel one. The Simon Commission made a similar suggestion in some other connection in their report and they cited, as a precedent, the practice of adoption of Parliamentary legislation by the County Councils in Great Britain. It must be clearly understood that the development of industries does not embrace within its scope such development as may be possible to secure by grant of tariff assistance.

36. Lastly, reference may be made to the constitutional problem of control of production, supply and distribution of commodities. Under the existing devolution rule, as under the recommendation of the Nehru Committee, the subject is treated as a central one. With regard to the industrial commodities, this power is closely connected with the subject dealt with in the just preceding paragraph. Should the development of industries be for reasons explained, decided to be treated as a provincial one, it follows that the power of control over production, supply and distribution of the industrial commodities should also rest with the provincial authorities. It may be emphasised here that the most vital problem which confronts the present-day industries is the problem of marketing and one of the important respects in which a forward industrial policy of a provincial government may have to be made felt is by controlling the marketing methods of the products of the industries. Turning now to the non-industrial or agricultural commodities, it will be seen that the need for provincial control is as imperative here as in the case of industrial commodities. Already in Bengal the control of jute crop is a live issue of current economic and financial importance. One of the outstanding economic problems of this province is the organisation

of a proper marketing of the jute crop "from the field to the factory." Clearly definite responsibility must be fixed on the province in this behalf and such responsibility can be best exercised if enjoyed exclusively by the province. Here also it might be pointed out that the production of a commodity outside the territorial limits of a particular province, as for instance outside Bengal in the case of jute, would frustrate the action or policy of a single province without the concerted action and active co-operation of the neighbouring provinces. But as in the case of waterways so in this particular field, we visualise that a contact will be established as among the neighbouring provinces wherever necessary. The necessity for such contact, we may emphasise once again, is no reason for the removal of a subject from the provincial sphere. Constitutional federalism and the avoidance of economic conflict as among neighbouring political authorities is irreconcilable. The fact that federalism has been practised in other countries clearly points to the irresistible lesson that the independent exercise of constitutional power is of greater value than the complete elimination of the risk of conflict with the neighbours. Should, however, it be still considered that the door should be kept open for initiative of central government in this field also, we insist that the important reservation suggested with regard to the development of industries might also be made enforceable here.

II.

37. We now pass on to examine the constitutional implications of an Indo-British trading convention by the terms of which it is proposed to rule out the scope of aggression by any of the future governments of India on the vested foreign commercial and industrial interests in this country. It is necessary, however, to examine the facts of foreign commercial exploitation of this province before a *status quo* is guaranteed to the foreign capital operating in this country. It is easy to imagine that with the present predominant position in trade and commerce guaranteed to the foreign capital, there will be little scope left for the Indian capital in the industrial field of Bengal. It is true that in the mofussil districts smaller industries might be made to grow ; but in what may be regarded as the staple or key industries of the province, the door may be considered to be shut against Indian capital for at least many years to come. It may be asserted without the fear of contradiction that the jute, coal or tea industry presents little scope for further expansion. The Bengalee capitalist may therefore well ask how he is to find scope for his industrial ambition

if the *status quo* is to be guaranteed to the foreign capital once for all. It would be useless for the provincial government to adopt any policy making for an increasing diversion of capital in the industrial field. For, no capital can be employed in a field which does not hold out a prospect of a remunerative employment.

38. The position stated above is not, however, the only implication of a constitutional guarantee of *status quo* to the foreign capital. There is, at least, one field in which the trading activity of the foreign company is operating to the distinct prejudice to the interest of this province. We have in view the case of the inland steamship companies, the two or at best three of which among themselves held the practical monopoly of the entire inland steamship transport of this large navigable province of Bengal and a major part of Assam. In this field the companies which provide these transport facilities are not incorporated in this country. Nor, as far as we are aware, there is any element of Indian capital in them. The interest represents a close preserve of the British shareholders. The exception taken, however, is not to their British character but to their '*modus operandi*' of these companies. In the first place, various allegations have been brought forward against them from time to time. It has been pointed out that these companies are in an unholy combination with other European concerns of Calcutta. The latter companies definitely discourage and sometimes make it impossible for traffic being offered to other steamship companies than the British ones. The authorities of a Bengalee steamship company complained that the jute mills refuse, for instance, to purchase jute for their mills except what is carried by the British steamship companies. Again, the treatment accorded by these companies to Indian passengers has been the subject of periodic scathing criticism both in the press and in the council chambers. We do not consider we need go into a detailed recital of those facts ; nor need we multiply here all the instances in which the Indian trading interest is being prejudiced by the British steamship companies referred to above.

39. Other grievances voiced by the Indian public against the foreign merchants in Calcutta may also be referred to here. In the first place, it is a standing complaint of Indian merchants that the foreign banks are very reluctant to extend accommodation to an Indian trader. It is pointed out that while an European of no financial standing are supported by European banks in

various respects, an Indian trader whatever may be his standing or whatever his worth may be measured in terms of landed property or other assets is treated with scant sympathy by the managers of European banks. Secondly, persistent complaints have been made that the European firms in the Clive Street shut their doors against direct dealings with Indian brokers. It has often been complained that goods are sometimes sold by Indians to European firms but in order to make their offer acceptable to the authorities of the firms, it has to pass through a European who acts as direct broker with the purchasing firm. Thirdly, there is a signal absence of Indians in responsible position in any of the large commercial offices of the Clive Street. We presume that there are not to-day more than half-a-dozen Indians drawing a salary of over Rs. 500/- in all the European offices, who, as we have estimated elsewhere, have an aggregate assessable profit of near about 20 crores a year. The attitude of foreign firms in regard to employment of capable Indians is indeed astonishing. We must admit, however, that the grievances of the Indian public that we refer to in this paragraph are not such as can be remedied by means of any well-defined obligation thrown on the foreign merchants. We recognise that it is impossible to curtail the independence of the firms whether in regard to extension of credit to Indian traders or the admission of direct brokers or the employment of suitable Indians. In the formula, however, that we evolve in the following paragraphs as a kind of palliative measure against these grievances we take this fact fully into account.

40. We consider that a trade convention guaranteeing equality of rights between Indians and foreign traders can only be established subject to the following reservation :—

Reservations against
equality of trading rights.

1. That in promoting a new company which is not a private limited one, at least half the number of shares must be held by natural-born men of the province in which the company is promoted and half the number of directors must also be drawn from among them. The local Government at the recommendation of a special machinery shall have power to exempt the promoters of a new company from such an obligation, when it is ascertained that there is no desire to take up the reserved amount of shares.
2. With regard to every existing company engaged in any industrial activity which has not one-third of its

shares held by natural-born men of the province in which the company is registered, the managing agency firm, a partner thereof or any of its directors shall not sell to the market any of their or his shares of the company without first offering them for sale to the Provincial Investment Trust, in case any such institution be established in any province, with a view to securing larger interest of the natural-born men of the province in the shareholding of the existing companies.

3. In Bengal, the legislature shall have the right to deal with the existing foreign steamship companies in such manner as they may find it necessary.
4. In Bengal a small commercial arbitration board shall be set up with the Minister in charge of the Commerce portfolio as the chairman to investigate and report upon any grievance which may be brought forward with regard to the refusal of accommodation by a foreign bank, or extension of direct dealings by European houses or with regard to candidature for employment in foreign commercial offices. Such enquiry by the Board shall only be entertained if asked for by public bodies specially recognised for this purpose. The results of the enquiry of the arbitration board in each instance shall be laid before the legislature as a Parliamentary Paper. The board will consist of the chairman as mentioned before and two other members, each of the parties concerned nominating one.

III.

41. Having regard to the picture of economic life of Bengal, more specially the share of the children of the province in the trading activity within its border, we anticipate that necessity may arise not only for safeguarding the interest of the province against foreign aggression but also against the trading aggression of other provinces. Every Indian is welcome to migrate from one province to another and carry on what trading or industrial activity he would in that province. But the position becomes entirely different when the trade of a particular province finds or attempts to

Proposal for an inter-provincial convention.

find a market for it in another. It is not intended for a moment to rule out inter-provincial trade relation. On the other hand, owing to the special resources of each province the relation among them is bound to be closer and closer as the process of economic development becomes more and more intense. But the possibility must never be lost sight of that the trading activity of one province might interfere with the growth of identical trade in another. It is not even unlikely that the provinces will seek to bargain with one another in regard to the trades in which each holds a key or a strong position.

42. Analysing the figures of inter-provincial trade as are available for the year 1921, we observed that there is a number of commodities entering Bengal in which a conflict between the provinces is incipient. Firstly, there are the piece-goods in the Bengal market which is the product of the large cotton textile industry located in the Bombay Presidency. According to the figures we have been able to compile, it appears that in the Calcutta port zone, no less than 1,252 million yards are imported from other zones against a production of only 134 million yards within the zone itself. The Calcutta port zone in respect of piece-goods is regarded to serve the whole of Bengal, the whole of Assam, the whole of Bihar and also a part of U. P. It is noteworthy that the indigenous mill piece-goods are used far more in the province of Bengal than in any other parts of the Calcutta port zone, the consumption in those areas, specially in Behar, being very largely met from hand woven goods. After careful reflection we estimate that no less than, 1,000 million yards of Indian piece-goods out of 1,252 millions estimated by Mr. Hardy as having entered the Calcutta zone in 1927-28 were consumed in Bengal alone where, it is to be further remembered, the standard of living is higher than that in the other provinces owing to a larger element of educated persons. This 1,000 million yards consumed in Bengal may be valued at not less than 10 crores of rupees. Such a figure also agrees with the value of Indian piece-goods which entered Bengal in 1921, shown in official report at near about 6 crores of rupees. For, we presume that since 1921 owing to the effect of the gradually progressive Swadeshi movement a larger and larger quantity of foreign piece-goods is being replaced by the output of Indian mills. In all likelihood Bengal will in future try to build up its own cotton textile industry. Should such an effort be made by the Bengalee capitalists, it is obvious that the large share of the Bombay cotton industry in the piece-goods trade of Bengal will be looked upon with disfavour and probably also with hostility. A similar instance of an incipient conflict between Bengal and other provinces may also be traced in the present import of salt in the

Bengal market from other provinces. In 1929-30, 7.6 lakhs maunds were imported into Calcutta from Bombay, 4.7 lakhs from Karachi, 1.8 lakhs from Okha and .8 lakh from Tuticorin and an enormous quantity of 51.3 lakhs maunds from Aden. There is a strong public demand in the province for revival of the salt industry. Should the public demand materialise, it is equally certain that the new Bengal industry would desire protection against the imports of salt from other Indian sources. For the present we cannot lay our finger on other spots of incipient provincial conflict in the sphere of industrial competition. But a reference may be made here of the large import of grain and pulse and ghee into Bengal which was valued on the basis of figures of 1921 at 6.87 crores and 1.87 crores of rupees respectively. It is difficult to say whether there will be any demand from agricultural Bengal to supplant the contribution of other provinces by the increased production of the province itself. The import of grain and pulse includes no doubt, a quantity which is exported out of India from the port of Calcutta. Again the existing resources of the province are presumably too limited to meet the entire consumption and what is still more necessary to remember is that the commodities involved are food products. In any event, we make reference to them for purpose of illustration of fields where a conflict of policies between two provinces is possible.

43. We do not consider we need enter into a more detailed analysis of the inter-provincial trade. The position is sufficiently clear that danger spots are there and nothing will prevent more loss of cordiality as among the provinces if a formula were adopted at the threshold of a new constitution as to the manner in which inter-provincial trade is proposed to be handicapped in the vital economic interest of an aggrieved province. The formula that we suggest for regulation of restriction on inter-provincial trade is this :—

Formula suggested.

Any province shall be at liberty to levy a terminal tax at the destination on the basis of the origin of traffic obtained from a specific provincial source, if it considers that such an imposition will promote the best interests of the corresponding trade built up or proposed to be built up within the province.

44. While referring to the possible inter-provincial hostility in future in the economic field, we feel it necessary to record our emphatic view that the existing provincial boundaries are of an arbitrary character, and as such, demand a satisfactory re-adjustment. Apart from their cultural, linguistic and athenic homogeneity, we

Re-adjustment of provincial boundaries.

are of opinion that each of the component government in the future federation of India should represent a distinct economic unity; particularly we hold that each of the provincial area should as far as possible be completely identified with one or two important localised industries. We are perfectly aware that this latter principle cannot be given effect to in its entirety. It is no longer possible to constitute the provinces on an entirely clean slate but wherever economic homogeneity in the restricted sense in which we have used this expression here, can be permitted by slight adjustment of the boundaries of the existing provincial areas, we are strongly of opinion that the possibility of such re-adjustment must be fully exploited. At all events, speaking for Bengal, we consider that there is a strong case for such re-adjustment of boundaries in furtherance of the economic interest of the province. In our opinion such consideration demands that the districts of Purnea, Singhbhum and Manbhum in Behar and the districts of Cachar, Sylhet and Goalpara in Assam, which are closely adjacent to Bengal and bear strong linguistic and cultural affinity with the Bengalees should be restored to this province at the earliest possible opportunity. It seems to us, for instance, that if the district of Manbhum be added to the province of Bengal, the latter will represent economically a more complete economic unit than before in that almost the entire coal industry will fall within the territorial limits of our province. Similarly, the addition of Surma Valley districts of Assam to the province of Bengal will in a very large measure identify our province with the tea-producing interest. We have been impressed with the difficulty which arises even under the present constitution of a particular industry being situated within the territorial jurisdiction of more than one province. The task of administration in relation to this industry becomes more complicated and the industry itself greatly suffers. If such be the unsatisfactory position under the Government of India Act of 1919, we need hardly say how the position will assume a serious aspect after the provinces shall have been mistress in their own houses and greater responsibility shall attach to them in the economic development of the country. It must be understood, however, that we have approached this question of re-adjustment of provincial boundaries purely from the economic stand-point. On this alone we consider that action is needed, but we should by no means be understood to suggest that other considerations pointing to the same conclusion do not exist.

45. These proposals round off the recommendations that we have to make with regard to the various subjects which we undertook to examine. We cannot, however, bring our report to a close without

Acknowledgments.

mentioning the valuable services of Mr. K. M. Purkayastha, M.A. who throughout the study has acted as our Secretary. His sound knowledge of public finance, his wide study of constitutional literature and his intimate knowledge of the trade and industries of the province have proved a great asset to us. Indeed, this study would not have been completed at the short time at our disposal but for his hard labour prompted by a keen sense of public spirit. Mr. Purkayastha was ably assisted by Mr. K. C. Bose, M.A., B.L., in compilation of facts and figures as also in a number of other ways.

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PRESIDENTIAL ADDRESS

LADIES AND GENTLEMEN,

Let me at the outset thank the members of the Economic Association for the confidence they have shown in me by electing me to preside over their deliberations at this Conference. Indeed to a student of any subject nothing counts as much as the appreciation of fellow-students devoting themselves to the same field of study. This Conference is being held at a most momentous time since it may be stated without any exaggeration that no past year ever witnessed as many epoch-making events in the world of economics as the year that has just passed, 1931. It is indeed a happy circumstance that the venue of this year's Conference is Bombay, the premier industrial City of India. This City has a peculiar hold on the country since it has been throwing up from time to time business men of genius who have given evidence of daring originality of conception and patient determination in execution. Further to students of Indian Economics the names of Ranade, Gokhale and Tata easily occur. Presiding over the last Economic Conference held in this City of Bombay in 1924 our distinguished countryman Sir M. Visveswarayya made the remark that the City was passing through an economic depression. The audience before me do not require to be told that the City has been afflicted with that depression ever since and recently it has become much more pronounced. When one reflects on the fortitude shown by this great City through the accumulation of distress it has been unfortunate enough to pass through during the last 10 years, one is filled with the hope that in the coming era when the sons of the soil will be called upon to shoulder the burden of the determination of policy as well as the execution of it, the City of Bombay will play a dominant and striking part.

The year 1931 that has just passed will become memorable in the history of the world for the extreme depths sounded by the world depression in trade and England having gone off the gold standard. To the student of Indian economics the year that has passed since the Conference met at Lahore has been crowded with

events of outstanding significance. Firstly, the economic depression which it was expected would pass away has become more widespread and deep-seated since then and India has been affected more than most nations. It may well be that on no single problem since the creation of the world has so much of brain power been concentrated as on the causes of the present depression and the measures for remedying it. Secondly, the preliminary figures of the census of India came to be known and the large increase in population disclosed by them has been giving food for thought to Indian economists and publicists. Thirdly, Sir Arthur Salter whom the Government of India invited to report on suitable machinery for the satisfactory handling of economic questions submitted a valuable report on the project for Economic Advisory Councils for India. Fourthly, the Royal Commission on Labour submitted its unanimous report and the conspectus of industrial labour conditions in India which the Report has furnished has revealed in a very striking manner the heavy arrears of progress that industrial labour has yet to make up before labour conditions may be considered satisfactory. Fifthly, the Central Banking Enquiry Committee has submitted a voluminous report covering a wide range of topics with the proper understanding of which is bound up the provision of means for promoting agricultural, industrial and commercial progress in the country. Sixthly, the severe repercussion of the trade depression on the finances of the Central and Provincial Governments made them embark on measures of retrenchment and fresh taxation to a degree not paralleled on any previous occasion in the history of British rule in India. Lastly, closely following the departure of England from the gold standard the Indian currency system ceased to be linked to gold and became linked to sterling. The very enumeration of the above events is likely to bring home to everybody the magnitude and significance of current Indian economic problems and the burden of responsibility thrown upon those who are directly concerned in the teaching of Economics and the study and investigation of economic problems. Though the Economist has to be rooted in economic theory the subject in the study of which he is engaged is, in the main, a fruit-yielding one. This circumstance imposes considerable responsibility on the economist and the public are led to expect from him guidance in the comprehension and treatment of the many economic problems that may assume suddenly rather an unexpected complexion.

It is one of the paradoxes of our civilisation that ten years after the termination of the Great War of 1914-18 an industrial depression of a severe and unprecedented character should have

overtaken humanity. Various interpretations have been placed on this phenomenon. It has been said that the distress through which the world is passing at present is nothing but the travail heralding the birth of a more satisfactory economic organization. Some thinkers conceive of this development as a challenge to the capitalist system. Others conceive of it as the failure of the gold standard. Doubts have been expressed whether capitalism has not outlived its period of usefulness. The economic blizzard that has been blowing so fiercely all over the world and that has shown no signs of abatement in its fury is considered by some to mark the death throes of capitalism. Let us examine the problem dispassionately.

What lends point to the situation is that this depression followed in the wake of various attempts to implement what may be called an international outlook. With a flourish of trumpets the Bank for International Settlements was founded at Basle which, it was hoped, would tend to bring about harmony in the working of the world exchanges. It was pointed out that the Young Settlement of the Reparations Problem lifted the whole question out of the morass of political inanity into the haven of commercial reckoning. The author of the plan Mr. Young delivered a lecture not long ago which laid stress on the health which the settlement brought about in international relations which he hoped would make for the peaceful economic progress of the world. Most parts of the world neutral as well as belligerent in the war of 1914-18 have not yet recovered from the depression into which they were thrown in 1920. In these circumstances when longing eyes were being cast on the horizon for discovering any signs of trade revival what actually happened was a catastrophic fall in prices extending over almost the entire region of productive activity. Economists and business men were almost taken aback by the violence and all encompassing character of the tornado. It appeared to the reflective mind an uncalled for gratuitous infliction. It almost amounted to the bankruptcy of human endeavour that producers who except in the United States of America have been suffering for years on account of a very gradual fall of prices and who were anxiously watching for signs of trade revival should face overwhelming losses on account of a rapid landslide in prices. It is true that economists have for some years been pointing out that the accretion to the gold resources of the world will in future be at a reduced rate. This warning, however, was not pressed home since, with the progress of banking and the economy of gold that was becoming widespread, it was rightly felt that there was no danger of the fabric of world production collaps-

ing ~~ship~~ from the inadequacy of gold. At any rate no first-rate economist realised that the commercial world came in the autumn of 1929 near the brink of a precipice involving a violent shock to the whole economic system. All the phases of the depression have come under very close and searching examination from different points of view. While realising that many powerful minds have thrown light on the problem I should like to elucidate briefly my approach to it.

The opinion is gaining ground that the present depression presents features of a kind that can only be explained by the fact that we are at the end of one epoch of world economic relations and at the beginning of another. Such a conception can swim vividly into our consciousness only in the light of the history of economic evolution since, say, the beginning of the Industrial Revolution. Humanity seems to have reached one of those few milestones in the history of economic progress when the entire fabric of economic thought and practice is being subjected to a very searching examination in an atmosphere of nervous expectancy.

We are often disposed to forget that the economic organization of life in its present form is after all only about 80 years old. It is only from about the middle of the 19th century that most industrially advanced countries of modern Europe came under the influence of what may be termed the Industrial Revolution though England began to undergo that experience a little earlier. The country that was the foremost expression of this capitalist organization of society was, for long, Great Britain. She was the workshop of the world and for years she was not merely the model but also the source of inspiration of ideas in industry for the rest of the world. England was the country where the conspicuous features of modern economic organization were finding their characteristic expression for a number of years—division of labour, application of science to agriculture, industry and transport, large scale production, localisation of industries, urbanisation, joint stock organization of production, the application of large masses of capital in industry and an organized money market. A remarkable transformation of the world on the economic side was then witnessed the moving spirit of this transformation being England. Till about the end of the 19th century the stage was dominated by her. A technique of international economic relations had been gradually built up based on a huge export of capital from England continuously to different parts of the world. One of the features of this technique was the large supply of railway material from Eng-

land to different countries of the world which were being opened up and the building up of a strong mercantile marine employing steam power engaged in the conduct of trade between different countries. Another feature was the development of a world market for capital and a money market in London which stood the world in good stead by the efficiency with which it financed a large portion of the international trade of the world. A third feature was the harmony in interest that was built up between what may be termed the foodstuffs and raw materials producing countries and the manufacturing countries of the world. It was found by experience that new countries like Australia, Canada, the United States of America and India and developing countries like Germany required huge masses of British capital for furnishing themselves with the apparatus of modern economic life—particularly the railways and in return supplied England with foodstuffs and raw materials which, in increasing quantities, were required by busy manufacturing districts whose population increased in numbers not less rapidly than their standard of life. Though in the last decade of the 19th century England was beginning to feel the competition of Germany in the industrial field, it may be said that England occupied a position of unquestioned supremacy in these respects during the second half of the 19th century. Another feature of the technique that was developed during the period was the gold standard. It has become to such a considerable extent part of our economic life that we may not realise that most advanced countries of the world went on the gold standard only since 1870 and the now powerful country of the United States of America went unequivocally on the gold standard only during the last decade of the 19th century. The leadership of the economic world throughout the period remained with England for a number of reasons. She commanded cheap sources of power, her inventors were busy and lucky, her captains of industry showed great resourcefulness and capacity for organization and her banking system was an embodiment of efficiency, elasticity and vigour. Other nations like Germany, the United States of America and Japan, which have in the 20th century become her formidable rivals in manufacturing activity, were then developing their industrial structures very largely with the aid of the capital borrowed from England. In the light of the muddle into which the structure of world economic organization has been thrown recently one is led to think that it was fortunate that, during the formative period 1870 to 1900 when the gold standard was being introduced into different countries and when organised industries were growing in

Germany, the United States of America and Japan, the leadership of world economic forces should have been held by England without a rival leading to unity of direction which helped forward the steady and rapid economic development of the world while England herself profited largely. This reflection receives considerable reinforcement from the circumstance that the period from 1873 to 1896 witnessed steadily falling prices. Up to the outbreak of the war the lineaments of the world economic structure remained more or less the same. The competitors of England were however growing in industrial strength. France was becoming an increasingly important creditor nation, while Germany also was beginning to invest capital abroad. The self-governing Dominions of England were also aspiring for a place in the industrial sun. In spite of these rumblings the world economic order was in equilibrium and England continued to hold, though with increasing strain, the position of primacy. This was in no small measure due to the fact that a great accession of strength accrued to the gold resources of the world particularly on account of the yield of the South African mines which helped to raise the world prices of commodities. Thus at the outbreak of the Great War the capitalist system presented an aspect of formidable strength which, while leading to a large increase in the production of wealth, had succeeded in securing for the bulk of the people a standard of life far higher than what prevailed about the middle of the 19th century. On such a world the Great War of 1914 broke. As the war drew one important country after another into its vortex, the dislocation of the old economic order was increasing in its range and intensity. A new alignment of economic forces was taking shape. The old channels of international trade in many instances got blocked up and new channels necessitated by the needs of the war were cut. The upheavals were so tremendous that the end of the war witnessed an economic world in a state of flux the bearings of which could not be clearly comprehended by the most subtle of men. The uncertain factors in the situation were so many and of such incalculable magnitude. No single question caused so much complication and disturbance as the currency question. Though great changes had come over the magnitude and direction of world trade, though the conception of the gold standard itself underwent much modification and though it was felt that reparations and tariffs complicated the situation, the prevailing impression was that the old formulæ that had been evolved with reference to economic life till 1914 would be restored to their accustomed places and that there would be no fundamental changes in the organization of economic life. This con-

viction lay at the root of the large amount of capital lent on short and long term account to Germany by the United States of America and England between 1925 and 1928 in the hope that German efficiency and toughness will create the necessary surpluses for meeting reparations payment and her commercial obligations. Even the speculative movement on the New York Stock Exchange which gathered strength in 1929 did not shake this self-complacency.

Though economic events do not explode dramatically like political events the developments in the economic situation since the autumn of 1929 have been marked by a sweep and intensity rarely witnessed in history. A series of events followed the Wall Street crash in more or less quick succession which shook the faith of thoughtful men and made them realise that world economic relations had entered on a new phase and that the task of restoring equilibrium assumed an altered complexion on account of a conjunction of forces and tendencies the import of which had previously not been adequately comprehended. Those events were in the main the catastrophic fall in the prices of commodities, the greater relative fall in the prices of foodstuffs and raw materials leading to what has been termed the 'barter crisis,' the financial straits to which countries like Australia, Argentina and Brazil were reduced, the threat of impending German bankruptcy and the crisis in England leading to that great and powerful country going off the gold standard. That a country with about £4,000 millions of capital invested overseas, which is the greatest international capital market and the repository of much of the free balances of the world should be driven off the gold standard in a time of peace even after the formation of a National Government which gave unmistakable evidence of its determination to balance the budget is an event of such outstanding significance that the circumstances which led to it require examination.

Strange, as it may appear, with reference to the practical Englishman, it was his absence of realism in regard to the working of the gold standard that, in the main, brought about the crisis in England. Having worked the gold standard ever since its inception in a manner that promoted economic progress throughout the world during the period of her unquestioned ascendancy in international finance and banking, England did not quite realise all the dangers inherent in the working of the gold standard since the pound came back to gold parity in 1925. A change had come over the proportion of world trade held by different countries. Whereas the position of the United States of America

in that respect became stronger, that of England was weaker. In these circumstances having regard to the large accumulation of gold in the United States of America no portion of which she was anxious to release and the steadily increasing drain of gold into France since the Wall Street crisis, England, which laid great stress on the supreme importance of maintaining the gold standard should have displayed a greater sense of her wonted realism. It was rather unfortunate that influential organs of public opinion in England together with some of her distinguished bankers helped to divert attention from the peril inherent in the gold situation as it was developing by expatiating on the symptoms of overproduction of commodities and the need for the reduction of labour costs. This faulty distribution of emphasis did not give the right lead to English public opinion. One who looks beneath the surface can detect during recent years in England a mild, and, it may be, suppressed, conflict between two schools of thought. One school represented by some of the great bankers was most emphatic about the maintenance of the gold parity of the pound sterling and called for a rapid reduction in wages and salaries. This school was impressed with the supreme necessity for maintaining the importance of London as an international financial centre. They did not sufficiently realise the danger to the gold standard arising from the growing maldistribution of gold and did not therefore press strongly for concerted action on the part of the great central banks of the world. This school gave much publicity to a book by a French author who criticised the want of adaptability and flexibility of British Industry while France was helping to undermine world economy by withdrawing huge quantities of gold from the world stock of that metal. The other school of thought was, in the main, represented by Professor Keynes, Sir Josiah Stamp and some businessmen. They were particular even like the other school that the competitive power of the basic industries of England should be restored. This school was aware of the various conditions that brought about the instability of the economic structure of the world. But they were particularly impressed with the danger to the capitalistic system involved in the massing of increasing quantities of gold in the United States of America and France. They were apprehensive of the heavy fall of prices which may result from this development leading to many countries going off the gold standard. They were keen about exploring the avenues of international agreement in regard to the basis of credit with a view to arresting the fall of prices and reviving confidence. They however did not have the same hold on public

opinion as the other school. It was rather extraordinary that those in England who were very keen on maintaining the gold standard did not adequately realise the implications of the steady massing of gold in the United States of America and France. Under the gold standard it should have served as a danger signal, the import of which it is difficult to mistake. To Great Britain particularly the development was of ominous significance. For she had a large amount of capital in goods abroad like Railways, rubber estates, tea gardens, oil wells, tin and gold mines. Her economy is partly based on the prosperity of countries producing raw materials and foodstuffs like Australia, Argentina, Brazil and India which a huge fall of prices is likely to place in the category of defaulters. Further, England has been increasingly borrowing funds on short-term account. Her internal economy has had to withstand the inelasticity of wage rates thus placing the industries under a great handicap. In these conditions the accumulation of gold in the United States of America and France should have in time shaken England out of her self-complacency and made her withdraw her credits, realise her securities and accumulate gold. She did nothing of the kind but seemed to have believed that she could somehow muddle through to success. There was not, one should think, sufficient recognition of the conditions under which alone the very delicate system of the gold standard can work. In the altered conditions of international trade and finance since the end of the Great War England did not fill the same relative position as she did before. Whereas before the war England was the dominant world market for capital and she was the foremost commercial country with the heaviest foreign trade flourishing under a policy of free trade, since the war conditions had altered. The foreign trade of the United States of America exceeded that of England and tariffs stiffer and more widespread governed a larger proportion of the world trade. Whereas before the war the monetary gold of the world was dispersed in circulation among the people of many countries besides finding a place in the central banks, it came to be concentrated in recent years to the extent of about 70 per cent. in the central banks of two countries only. Having regard to the potentialities for instability inherent in the unsatisfactory political relations subsisting between France and Germany it was the part of wisdom for England to have adopted a cautious policy of limiting her international obligations on short term account, realising her securities and accumulating gold. Any other policy, whatever justification it might find in pre-war precedents, was out of accord with the requirements of the situation particularly while great countries like the United

States of America and France were sitting tight on a huge quantity of gold which was the basis of the currency and credit system of the whole world.

The only development that might have enabled England to remain on the gold standard was a check to a further fall of prices, if not a recovery thereof. The political relations between France and Germany gave the finishing touch to an already complicated situation. With the heavy recall of funds from London in an atmosphere of nervousness England had to go off the gold standard.

One need not however deplore the decision of England in view of the fact that under the circumstances governing the continued maldistribution of gold the maintenance of the gold standard by England would have led to the disequilibrium of the balance of payments becoming much more pronounced than ever. The mere granting of further credits by France and the United States of America just before September 20, 1931, in the absence of a comprehensive policy regarding the gold situation in relation to world price levels would have enabled England to continue the maintenance of the gold standard for some time more but would have accentuated the unfavourable character of her balance of payments. For, the continued rise in the value of gold which would have supervened would have led to the hardships from which England was suffering becoming more pronounced. The breaking away from the gold standard gave some fillip to industrial production in England. The feeling of something like fatalism that was creeping over England for some time past received a much-needed check. The appropriateness of the action of England in the circumstances received confirmation in the attitude displayed by various other countries in respect of the gold standard. To us in India, a long overdue relief came as a result of the rupee being divorced from 1*s.* 6*d.* gold.

The important question, however, is the future of the gold standard. There are many elements of instability in the present situation. The heavy and continued fall in prices has brought about the derangement of the international capital market. For, the debtor countries growing primary products have found themselves unable to stand the strain of the payment of interest on capital already borrowed from the lending countries of the world. There is, besides, the peculiar position of Germany with a cloud of uncertainty hanging over the reparations question and her short-term obligations. A number of proposals are being made with reference to the machinery of currency organisation for the future. Bi-metallism is one such remedy proposed. But in the

absence of harmony between the important countries of the world, an eloquent exhibition of which is seen in recent events, there is no chance for old prejudices breaking down and a new harmony developed with reference to the adoption of the proposals for bi-metallism. Another suggestion that is made is to organize the economic and financial structure of each individual country with reference to an index number of prices. This suggestion again cannot meet the requirements of the situation, for the economic structure of the world thus far has depended to such a considerable extent upon international trade that the adoption of the proposal by individual countries of a scheme of regulation with reference to an index number of prices is incompatible with the maintenance of international trade on a level that could square with world prosperity. We are therefore thrown back upon the solution represented by the rationalisation of the gold standard. There is no doubt that, if only international understanding is secured and a genuine peace mind is brought to bear upon the solution of world economy, a situation is sure to be developed which will permit of all the wheels of international trade running again smoothly without perpetual dislocation of it by impossible tariffs and reparation payments. Given a will to work out a solution, there is enough monetary gold in the world to set the machinery of production and distribution running again so that continued prosperity is achieved. In this connection one feels that a strong permanent committee of economic and financial experts of very high standing well known for their freedom from obsession of militantly nationalistic outlook and regard for general prosperity and drawn from important countries of the world is urgently called for so that proposals of a very authoritative and reasonable character may be made with a view to breaking the present depression. Until, however, an international solution is reached it will be suicidal if proposals are adopted for restoring the gold standard by England. It is much better that the temporary inconveniences resulting from a fluctuating exchange are endured than a premature attempt is made towards the restoration of the gold standard.

THE BANKING *PROBLEM* IN INDIA.

To the student of Indian Banking, considerable material is available at present in the shape of the reports of the Central and various Provincial Banking Enquiry Committees. These reports deal with the entire field of banking organisation in all its different aspects. Indian opinion had been insisting for a long time on a thorough examination of the banking problem in

this country and it is satisfactory to record that the practical statesman has now at his disposal a large number of proposals having for their object the equipment in adequate measure of banking facilities.

The banking structure in India like that of every other country is the expression of its social and economic organisation. It derives its peculiar complexion from the various aspects of its economic life, among which the following are of particular importance, viz., 90 per cent. of the population living in rural areas, 73 per cent. being devoted to the pursuit of agriculture, the production per acre perhaps the lowest in the world, the very low standard of life and the absence of a keen desire for improvement, the very low amount of savings in the villages, and the prevalence of small scale production in agriculture and industry.

Taking the condition of the villages, we are struck with the absence of savings on the one hand and the absence of any effective agency directed to the improving of the conditions of life. This explains why the co-operative movement has not made as much progress as it might have done. The extent of rural indebtedness has been computed to be about 900 crores. The organization of economic life being on the whole mediæval, the structure of banking as applied to rural life reveals characteristics out of accord with modern conditions. It is the fashion to pillory the moneylender who is held responsible for the resourcelessness and helplessness of the ryot. It is true that the moneylender in India has not taken the lead in any scheme of amelioration. But having regard to the nature of the economic organization in the countryside the moneylender admirably fits into it. In the absence of savings and the readiness to carry out obligations punctually and promptly, the services of the moneylender of the type with which we are familiar makes itself felt. The scope for raising the structure of credit on solid foundations in the villages depends on the spirit that informs the economic organization of life undergoing a radical modification. In such event, there will be scope for co-operative credit banks and Land Mortgage Banks functioning effectively and dealing with the problems of short and long term credit respectively. The Central Areas Banking Enquiry Committee Report points out probably in extenuation of the practices of the moneylender that the net rate of interest that he gets on his money comes to a very reasonable rate of about 6 per cent. only. If this is true, it only proves how the whole system of the credit economy associated with the activities of the moneylender is wasteful. It is on a par with the functioning of a tax machinery under such conditions that the net amount of

tax that goes into the treasury is about less than fifty per cent. of the amount paid by the tax-payer. The only escape from the unsatisfactory credit situation of the villages consists in promoting the rapid evolution of conditions that would enable the co-operative movement to work effectively in different spheres like credit, sale, purchase and production.

The Central Banking Enquiry Committee have rightly devoted considerable attention to the part played by the indigenous banker and have made various proposals so that he may be of much greater service to the interests of commerce and industry. One of the important problems of banking in India is the provision of means by which the indigenous banker may be effectively linked to the central money markets. His importance in Indian economy is due to a number of causes:—Firstly, the castes to which the indigenous bankers in different parts of the country belong have from time immemorial been doing banking service for the country and have inherited traditions that have grown with the progress of economic conditions in the country. Secondly, in view of the prevalence of small scale production in towns, the agency of the indigenous banker is peculiarly suitable. Thirdly, on account of the absence of adequate savings in the medium-sized towns, the scope for the creation of commercial joint-stock banks is not adequate. He also does a considerable amount of remittance work since he has connections with different parts of the country and joint-stock commercial banking has not spread widely in the country. He further finances trade, draws hundis and discounts them. The financial resources of a very large number of indigenous bankers scattered over the country are in the aggregate very large and consequently the dependence of this class of bankers on the central money markets is not very much. The Central Banking Enquiry Committee point out that, when the Reserve Bank is established, indigenous bankers who fulfil the conditions laid down should be treated as member banks with the right to have their bills rediscounted by the Reserve Bank. In this connection it is not quite clear to what extent the institution of the Reserve Bank will add to the bill portfolio of the indigenous bankers which will make it necessary for them to resort to the Reserve Bank for rediscounting purposes. Looking into the balance sheet of the Commercial Banks, one finds that among the assets of such banks, bills figure only to a very small extent. This shows that there are not enough bills available of such satisfactory character that the banks care to discount them. One of the most important problems that call for examination in this connection is the reason why the structure of industry and

trade does not admit of a larger number of bills being created. It may be that the want of confidence on the part of the Banks in many of those who carry on trade and industry in the smaller towns explains this lack of the creation of Bills.

Turning our attention to Commercial Banks, we find that whereas the number of towns in India is 2300, it is only in 339 towns in 1928 that we find a bank or branch of a bank or agency of a bank. This paucity of banks may be explained by the absence of enough savings which might become the subject of deposits, the small part played by large scale production by fairly big firms and big retail shops, the extent to which loans are required for consumption rather than production and the greater elasticity characterising the methods of the indigenous bankers.

A difference of opinion arose between the foreign experts and the Central Banking Enquiry Committee in respect of the scope for the expansion of banking facilities by the Commercial Banks. The foreign experts remarked that the country was not abounding with untapped banking possibilities. On the other hand the Banking Enquiry Committee referred to the various kinds of evidence which in their opinion pointed to the large scope that existed for the increase in deposits and therefore for the extension of the sphere of activity by the Commercial Banks. We, however, find that in spite of a little over 100 branches that the Imperial Bank opened since its formation, the deposits of the Bank have not shown any increase. It is, therefore, obvious that unless adequate steps are taken to improve the agricultural and industrial production, the scope for increased trade and increase in banking facilities is not likely to arise. An analysis of the assets of the Commercial Banks which discloses the very high percentage of investments in Government Securities shows that the scope for financing trade and industry by means of loans and advances is rather restricted. This shows that even the available bank credit represented by the small amount of deposits with the commercial banks is not fully availed of by trade and industry.

It would have been very helpful if the Banking Enquiry Committee had considered at length the question of the suitability of branch banking as contrasted with independent banking with reference to the character and the need for banking facilities in different parts of the country. One often hears complaints that the deposits collected by the branches in particular localities are spirited away to the headquarters, the localities concerned being thus deprived of funds. The history of banking furnishes illustrations of the good done by independent banking

as well as branch banking, regard being had to the peculiar conditions of different countries and their stages of economic progress. It may be a matter for exploration whether, in view of the difference of language between different areas, the advisability of enlisting local pride, talent and interest and the part medium-sized industries will have to play in the economy of India for a fairly long time to come, encouragement should not be given to independent banking wherever the conditions seem to be particularly suitable for such development. It may be that this method of advance may be fruitful in the matter of enabling the indigenous banker to become the Manager of a Joint Stock Bank. The objection that such independent banks would have on their hands large funds lying idle when the busy season of the locality is over loses its force in view of the fact that, on the establishment of the Reserve Bank, it will be open for the Banks to rediscount their bills and thus avoid the accumulation of cash lying idle in slack seasons.

In view of the unsatisfactory development of industries in the country, the Banking Enquiry Committee have devoted considerable attention to the question of financing industries. They have recommended that Provincial Industrial Corporations may be started with Government aid for the purpose. As for large scale industries like Cotton, Jute, Iron and Steel, etc., one feels that private enterprise has been found adequate to finance them. The recent financial difficulties of industrial firms are due to the conditions that affected the raw material and the unsatisfactory nature of the market for finished goods. As for small industries which, according to the various Provincial Banking Enquiry Committee Reports, suffer from lack of adequate finance, the question arises whether their difficulties are not due to the absence of the requisite capacity for organising the production of goods with reference to the raw material and the securing of a permanent and satisfactory market for finished goods. The State may devote its attention towards creating conditions under which co-operative organisation may be resorted to with a view to the placing of such industrial concerns on a satisfactory footing. With a scientific system of bounties and tariffs, a spirit of confidence may be promoted, which may admit of private enterprise being equal to the occasion in the matter of the provision of adequate finance for industries. The proper organisation of currency and credit by the Reserve Bank to come is likely to reduce the seasonal fluctuations in interest rates with the result that industrial finance will not be hampered by the high interest rates associated with the present currency and banking organisation.

It is rather remarkable that the managing agency system which is associated with successful trade and industry in India has not turned its attention to the line of merchant banking which may be made the basis of an organisation for enabling industries to secure funds from the general public.

The Banking Enquiry Committee have shown great enthusiasm for the very early establishment of a Reserve Bank. For nothing is more striking than the heights to which the bank rate rises in India during the busy season. In a scientific banking and currency organisation, there is absolutely no need in the conditions in which the trade of India is conducted in the wholesale markets, for the price of money to become very high in the busy season. This anomaly becomes all the more glaring since the percentage of the actual metallic portion of the paper currency reserve is very much higher than what the statute requires. It must be the obligation of the currency authority which in India happens to be the Government to finance legitimate trade requirements at reasonable rates of interest by issuing adequate quantities of additional currency. This is the only method available till the Reserve Bank is established. The term 'emergency' currency is not likely to give a correct notion of the purpose for which the currency is issued. In India, the season during which crops are moved annually requires huge quantities of additional currency the bulk of which later finds its way back into the currency reserve and the cash balances of the banks with the result that there is a large quantity of currency lying idle in the slack season with banks which does not earn appreciable interest. This demand for additional currency being a recurring one a reasonable forecast of which could be made with reference to the estimate of the weight of the different crops to be moved and their wholesale prices, means should be found for placing adequate quantities of currency at the disposal of business. It is extraordinary that the combined wisdom of the Imperial Bank, the mighty exchange banks and the Indian joint stock banks has thus far not devised a machinery for inducing the Government to place the required amount of funds at the disposal of trade at reasonable rates of interest, so that the producer of the staples of export trade may get better prices for his commodities and those engaged in industry may have the advantage of cheaper money. It is true that Government officials in charge of the Currency Department may not have the requisite qualifications and may not be competent to transact what is, in essence, a banking operation. It may, further, be urged that the issue of 'emergency' currency can only be made against trade bills which

are not available in the Indian market of sufficient quantity. These two objections though of some validity can be overcome. If the loans from currency reserve are made in the busy season for a short period against Government paper which the banks in India hold in large quantities, say at 6 per cent., it will have a beneficial effect on the producer of primary commodities and those engaged in trade and industry. Government officials may easily manage this business. A total limit of issue by Government may be set from year to year having regard to all relevant circumstances, like the estimate of the weight of crops to be moved, their prices, the presence or absence of speculation and the composition of the currency reserve. The sum total so fixed can be rationed among all the banks on the basis of the average amount of the loans and advances of each bank. At any rate since some considerable time may elapse before the Reserve Bank becomes an established fact, the ingenuity of the commercial world in close co-operation with the Government which is the currency authority must find some means by which the burden of high interest rates for financing legitimate seasonal trade should be removed. There is, however, at present an obstacle in the way of any improvement of the kind suggested above in view of the high level of the bank rate rendered necessary by the very difficult position of international finance and Indian exchange.

INDUSTRIAL DEPRESSION AND INDIA.

It has become a commonplace that the range of the present depression is world-wide. It embraces within its sphere rich as well as poor countries, manufacturing as well as agricultural countries. It is now our task to enquire what the re-actions of this depression are on our country. Everybody knows that the economic structure of the country has been severely shaken by it. It remains for us to assess the extent and character of its effect.

One of the characteristics of this depression has been that agricultural commodities have fallen in price to a larger extent than manufactured goods. India being mainly a producer of foodstuffs and raw materials it is obvious that the goods which she produces and exports have fallen in price more than those she imports the bulk of which are manufactured goods. Thus under the conditions of the present depression the terms of international exchange are against our country, since for every unit of our exports we get in return less than the normal amount of manufactured goods.

Let us see why agricultural commodities have fallen in price so heavily. It has been remarked that rationalisation has been applied so largely to agriculture recently that the markets of the world have been glutted and prices have fallen catastrophically. In this connection the backwardness of India makes the position particularly serious. Whereas as a result of improvements in production every unit of labour elsewhere applied to the production of agricultural commodities secures a larger return in goods, there is not the same advantage for India on account of primitive conditions of production. But in the matter of prices there is a single world market price for most of the staples. Indian goods have to sell therefore at the same price as non-Indian goods of the same quality. Since the achievements of science have made the world really small, the inappropriateness of India following backward methods while the rest of the world is advancing becomes manifest. Thus the peasant in the United Provinces and the Punjab has to sell the wheat he produces at the same price at which that of Australia, Argentina and Russia produced under conditions of rationalised agriculture has to sell.

It is a pertinent question to ask why the peasant should suffer if prices of his product fall. There need not be any suffering if all his obligations including the goods he buys and his debt burden are reduced in price correspondingly. The trouble is due to the fact that depression affects different goods in different degrees, commodities differently from services and leaves untouched contractual obligations expressed in terms of money. Herein lies the difficulty. In the case of the peasant in India almost all the main products of the agricultural industry have fallen very heavily in price while the taxes he has to pay fixed in terms of rupees have remained the same and his debt burden in money remains unaltered. As regards cost of cultivation it may be said that the typical peasant brings to bear on the cultivation of his holding the labour of his family besides employing the requisite number of labourers for necessary operations. The cost of the labour he employs may be incurred in kind or money, according to the crop and locality under reference. The adjustment is readily effected in so far as payment is in kind. In respect of payments made in money they take time for adjustment but in India since wages show a great tendency to correspond to the minimum of subsistence particularly in agricultural areas the tendency to adjustment to a lower level of prices does not present great difficulty. As regards the necessary commodities he purchases, most of them like cloth have fallen in price though some other commodities like salt and kerosene oil

have risen. The debt expressed in rupees becomes more burdensome and when we realise that rural indebtedness is heavy, one may have an idea of the distress it involves for the ryot. If we compute the interest on debt at about 10 per cent. only, the annual charge for interest amounts to about 90 crores of rupees nearly thrice the land revenue burden.

Taking the lot of labour with reference to the present depression it may be said that labourers on the whole gain, since their money wages represent more commodities on account of the fall in prices. But caution is necessary before we jump to conclusions. Though it is true that those labourers who remain in full employment at the old money wages do gain, in agriculture as has been pointed out labourers are paid in kind for most operations and where paid in money there is a fairly rapid tendency for adjustment to be effected. It should, however, be noted that agriculturist labourers do not get employment throughout the year and in times of depression optional undertakings like improvements in land, are postponed or reduced to the narrowest limits. This involves reduced employment and therefore reduced earnings.

As for industry the reduced purchasing power of the agricultural population combined with the fall in the prices of manufactured goods has reduced manufacturing industry to serious straits in an atmosphere which has increased the prevailing rates of interest. The unemployment figures in India are not available and the high figures of unemployment in manufacturing countries have not their counterpart in this country. For in a country peopled mainly by peasant proprietors economic distress due to depression takes the form of a big fall of prices leading to agriculture becoming unprofitable during the short period. In manufacturing countries, on the other hand, the losses made by entrepreneurs induce them unlike among peasant proprietors to restrict production which leads to visible unemployment.

Turning next to the re-action of the depression on currency and finance, one feels that the effects have been very harmful. While many of the sources of revenue, like customs, income-tax, excise, stamps, etc., shrink under conditions of depression the expenditure of Government being to a considerable extent contractual in character offers a great resistance to retrenchment. It may be urged from a theoretical point of view that apart from external obligations in gold which become burdensome in kind as a result of a fall in prices, depression need not necessarily lead to distress provided adjustments of prices, wages and debt burden are effected. In the modern money economy such adjustments are very difficult for a number of reasons. Many obligations like

debts are contractual in terms of money. The prices of different commodities move down with different velocities and the price of services reacts very slowly to a fall in prices. These elements of friction are the causes of distress due to depressions.

The currency situation in India has undergone a transformation on account of the depression. The Governments of countries like Argentine, and Australia, who produce foodstuffs and raw materials, depend on continuous imports of capital and have to meet external obligations on account of interest are in a similar position to India. They had to go off the gold standard. In India the Government was very hard put to it in the matter of maintaining the exchange value of the rupee. Even as going off the gold standard in the peculiar conditions of the working of that standard recently brought relief to England the divorce from gold of the rupee has had a beneficial effect on Indian economy. The controversy over the exchange value of the rupee has almost lost its meaning, now that the pound sterling is depreciated in terms of gold. The value of the rupee hovers about 13d. only gold at present. The real burden of the national debt of India, sterling and rupee, has been reduced considerably. The currency question throughout the world is in the melting pot and the currency system of India even as that of every other country in the world is sure to be organised with reference to the economic situation of the country as a whole thus safeguarding the general and permanent interests of the country.

ECONOMIC RECONSTRUCTION.

Perhaps no question is of greater moment at the present day than the determination of a plan of social and economic advance for the immediate future of our country. That the country's economic condition is grave will be obvious by a reference to the various criteria of economic progress. The main criteria are the following:—agricultural output per acre and per agriculturist; the average peasant holding; fragmentation of holdings, rural indebtedness; the pitch of interest rates; overdues in the co-operative credit movement; deposits in primary societies; wages of agricultural labour; wages and housing conditions of industrial labour; the part played by organised industries; paid up capital of joint stock companies; bank deposits; marketing organisation; the composition of the export trade; the per capita export and import trade; direct versus indirect taxation; state expenditure on welfare services; birth and death rates; infantile mortality; average duration of life; illiteracy; extent of technical

education; and middle class unemployment. When attention is directed to the above a sense of the great distance that we have yet to travel before a fair measure of material welfare accrues to our general population is borne in upon us. The contrast that our economic conditions present to those of the advanced countries of the world induces in us a sense of humiliation. Since the middle of the 19th century countries like France, Germany and Japan have witnessed such rapid economic progress that till recently an increasing population was being supported on a rising standard of life. It is a matter for examination why Indian economic progress did not run on parallel lines with that of the rest of the world. In the first place, India is a continent and the very extent of the area was a factor which may be said to have militated against rapid and sustained progress. Secondly, Indian attitude towards life has not been marked by a decisive predilection in favour of material progress which stood in the way of a persistent endeavour towards improved conditions of life. Thirdly, the caste organisation of society and the marks of a tribal rather than national attitude that still persist in some measure, whatever elements of real value they may embody, are not helpful towards the organisation of economic life on modern lines and an increase in the production of wealth. Fourthly, the economic condition of India before the Industrial Revolution may easily bear comparison with the contemporary economic condition of most of the advanced countries of the present day. Indian artisans then commanded a dexterity and deftness of fingers almost unequalled; and, on the whole, a healthy balance was maintained between agriculture, industry, the fine arts, banking and shipping. Since the Industrial Revolution, however, Indian progress has not been marked by the characteristics that have made the economic organisation and life of Western Europe, the United States of America and Japan what they are to-day. The social and economic organisation of the country did not display the elasticity and power of adaptation which was required by the changed conditions ushered in by the Industrial Revolution. Fifthly, the British rulers of India were nurtured in traditions that did not look with favour on either state enterprise or fiscal protection. Thus private initiative was, on the whole, a broken reed and the state apart from building railways and constructing irrigation works did not push forward any positive schemes of economic amelioration. The application of science to agriculture and industry which was making rapid strides in the western world made little headway in India. The operation of all these factors has resulted in about 73 per cent. of the population depending on agriculture, 90 per

cent. living in villages and 1.2 million persons only employed in organised industries. The methods of agriculture practised are so primitive and the soil has been rendered so poor that the average outturn of wheat per acre is 9 1/2 bushels, perhaps the lowest in the world. Indian economic life is thus not marked by what may be considered the characteristic modern features, *viz.*, the application of science to agriculture and industry, and a fairly high standard of life of the bulk of the people.

The articulate classes in the country have during the last few years been taking increased interest in economic questions. The unemployment of the educated middle classes which is casting its dark shadows over Indian life has invested the enquiries into economic questions with a new significance. The gaping contrast between political aspirations and economic realities has spurred thoughtful minds in the direction of making earnest endeavours towards improving economic conditions. The gigantic experiment that is being carried out by Russia having for its object the industrialisation of the country by means of deliberate planning has created a profound impression on thoughtful minds. Even in countries which have been the citadels of private initiative the State is taking upon itself new functions with a view to strengthening the industrial structure and conscious social control has been playing a progressively increasing and beneficial part. The balance of the economic structure in India leaves much to be desired and Indian poverty is such a stubborn fact that earnest minds have been set thinking whether a deliberate planning out of the immediate economic future of the country is not of urgent necessity. Whereas in other parts of the world the production of wealth is growing rapidly and a steadily increasing proportion of the national income is devoted to the consumption of comforts and luxuries, in India, on the other hand, there are not indications pointing to an increase in production more than commensurate with the increase in population. In these circumstances it is no matter for surprise that public opinion is awakening to the need for a conscious economic policy on the part of the State. While India is slowly making efforts for emerging from mediæval into modern economic conditions political progress in the direction of the introduction of democratic institutions is being achieved. A survey of the economic development of countries like Germany, France and Japan indicates that a growth of national solidarity went hand in hand with and facilitated economic progress. The increase in the production of wealth, the growth of applied science, a rise in the standard of life and the need for skilled labour were among the causes that created the conditions favouring the rise

of democracy. Thus it may be said that economic progress went rather in front of democracy and stimulated its growth. In India we are faced with the prospect of laying the foundations for modernising the economic organisation of life in an atmosphere of democratic political institutions. This consideration should help to quicken the sense of responsibility of the leaders of political parties who should realise that struggles in the political arena ought to be conducted in such a manner that the sense of nationality is rapidly promoted and the economic programmes that may be determined upon in the general interests of the country should be allowed to be worked out in the most methodical and efficient manner. This obligation is all the more of a compelling character since the resources of the people are limited and since taxable capacity has already been strained almost to the breaking point.

A realisation of the gigantic nature of the problem that confronts the country is essential if support is to be forthcoming for suitable measures towards remedying the situation. It is no less than providing elements of decent life for about 350 millions of God's humanity, one fifth of the human race. The condition precedent for economic progress is a distinct realisation on the part of the leaders of the people that economic progress is not only desirable but an urgent and overwhelming necessity. Secondly, there ought to be a general conviction that it is possible and practicable to adopt measures and devise courses of action that will have the happy result of promoting material welfare. Thirdly, whatever customs and practices stand in the way of economic progress should be subjected to a close and searching examination and public opinion should be convinced of the necessity for strong measures for their abolition. Fourthly, there ought to be the readiness to find the requisite money for carrying out policies that would promote material welfare, due care however being taken to secure that the governing consideration in the application of such money should be efficiency. Fifthly, an organisation has to be created which will be entrusted with the work of devising suitable measures of economic amelioration. In this connection we are happy to record that the Government of India recently invited Sir Arthur Salter of the League of Nations to report on the organisation of Economic Advisory Councils for India. His report was published a few months back and deserves thoughtful consideration. The prosperity of nations is so much bound up with the proper solution of complex economic problems that most advanced countries like England, Germany and France have felt the need for such agencies and have made provision for them. A

body which can take a view of the economic problem as a whole and consider it in relation to other spheres of social life as well as particular economic questions is an urgent necessity, if economic progress is to be steadily pursued and waste is to be avoided. In the special circumstances that surround political evolution in India at present, the overmastering need for an authoritative and competent body charged with the discussion of important economic questions and formulation of suitable measures is obvious, if economic improvement is to be progressively achieved without being interfered with by the play of party politics.

Let us sketch briefly some of the main problems that will have to be investigated by the proposed Council. Of foremost importance is the condition of the agriculturist. Rural indebtedness is now estimated to stand at about 900 crores of rupees. The recent catastrophic fall in prices has added tremendously to the real burden of such indebtedness. It acts as a dead weight on agricultural production. Though interference with the normal operation of economic laws may sometimes let loose forces disastrous in their operation the case for a fresh examination of the relations of debtors and creditors in our countryside may be of a compelling character. It should be one of the first tasks of any Economic Advisory Council to take in hand this problem, examine it in all its bearings and suggest suitable and, if necessary, bold measures for dealing with it.

It may not be out of place to point out that the indebtedness referred to has grown largely out of social and moral causes which require energetic handling if the peasant is to turn over a new leaf. Here comes the importance of devising methods which will raise his standard of life. All the available agencies including Government and leaders of public opinion must be infected with an enthusiasm for such a cause. It will be one of the foremost tasks of the Council to devise expedients of different kinds towards achieving this end. Non-Official Councils will have to be organised from the village upwards and officials should also be in close association with them in an advisory capacity. The executive authorities of the district should be in friendly and active touch with such organisations and all the departments of Government should take a lively interest in measures of amelioration and help towards creating an atmosphere favourable for progress. This will help to form the much-needed public opinion in favour of progressive policies. Methods of procedure should be worked out and devices adopted so that the members of the village councils would take a lively interest in self-improvement of different kinds, display a readiness to tax themselves and

maintain a record of the different aspects of the economic life of the village bringing it up to date.

Next comes the colossal task of bringing about the application of science to agricultural and industrial production. The question whether legislation is necessary for the purpose of securing consolidated holdings requires examination. The co-operative movement is not functioning properly on account of the absence of the true co-operative spirit. The weak points should be searched out and remedied. The movement should be broadened and deepened. The adoption of measures with a view to the creation of a healthy balance between agricultural and industrial production in the country should be one of the prime tasks of the Council. There are various other questions to be investigated like the middle class unemployment, the balance between different kinds and stages of education, the extension of irrigation facilities in the absence of safeguards for improved methods of cultivation being adopted, the reactions on economic progress of an increase in population, the economics of public health, the incidence and distribution of taxation, Central, Provincial and Local, Government's relation to the money market, purchase by Government of private railways, the contribution by Railways to the Treasury, State policy in regard to electrical development, the creation of warehouses, the operation of railway rates and the development of canal traffic.

It may be urged that questions like the above have not been neglected thus far and the reports of various Committees and Commissions appointed to investigate and report on specific economic questions attest the earnestness of Government. The weak point in the system consists however in the circumstance that there is no authoritative and competent body to review each economic problem in relation to other economic problems and the whole sphere of social life. Apart from this there is the disadvantage involved in the fact that a period of agitation has necessarily to elapse before a Committee may be appointed to deal with any question. The treatment thus has a tendency to become sporadic, fragmentary and imperfect. This perhaps explains why the reports of the various Committees have not been implemented by the Government of India. A permanent body with a continuous tenure dealing with the economic life of the people as a whole and specific economic questions, is likely to furnish the requisite co-ordination and continuity of policy, to awaken a new sense of responsibility on the part of the Government as well as the people and to create necessary traditions.

While developing plans for economic reconstruction one cannot help reflecting on the difficulty likely to be experienced in securing the necessary finances. But it should not be forgotten that the expenditure incurred in this connection is on a par with that incurred in the reorganisation of a business which has drifted into employing sloppy methods and using antiquated machinery. Only great care should be taken to secure that the interests of efficiency receive paramount consideration in the matter of the constitution of the Council. Financial stringency ought not to stand in the way of the organisation of an institution with the proper functioning of which is bound up the rapid expansion of the economic efficiency of the people and the augmentation of the sources on which public revenues depend.

Any avoidable delay in this respect is likely to have unfortunate results. The earnestness of keen men combined with the sense of frustration induced by unsatisfactory economic conditions is producing a number of fertile suggestions for development on different lines like a five-year plan for education, a rapid scheme of sanitary improvement, and State promotion of industrial banks. In the absence of a co-ordinating agency inspiring confidence by its efficiency and authoritative character, there is the danger of the State being stampeded into incurring expenditure on particular schemes which for lack of development of correlated schemes may fail to yield the expected results. Given satisfactory Economic Councils, given knowledge, courage, a sense of sacrifice and above all a spirit of good-will, the arrears of economic development that have accumulated may yet be cleared up in a short period and the vast population of this land will come into the possession of a rich life and enjoy material welfare of the kind which is open to the population of advanced countries like England and Japan.

CASE FOR BARDOLI

1931

PUBLISHED BY

THE ALL INDIA CONGRESS COMMITTEE

AHMEDABAD

Printed by M. N. Kulkarni at the Karnatak Printing Press,
318 A Thakurdwar, Bombay, 2, and Published by Jairamdas
Donlatram, General Secretary, Indian National Congress
Ahmedabad

TEN ANNAS

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The Government of India's Communique.

28th August 1931.

1. As a result of the conversations between His Excellency the Viceroy and Mr. Gandhi, the Congress will now be represented by Mr. Gandhi at the Round Table Conference.

2. The Settlement of March 5, 1931, remains operative. The Government of India and local Governments will secure the observance of the specific provisions of the Settlement in those cases, if any, in which a breach is established, and will give their careful consideration to any representation that may be made in this respect. The Congress will fulfil their obligations under the Settlement.

INQUIRY INTO BARDOLI AFFAIR

3. In regard to collections of land revenue in the Surat district, the point in issue is whether in those villages of Bardoli Taluka and Valod Mahal which were visited by revenue officials accompanied by a party of police during the month of July 1931, more severe demands, having regard to their material circumstances, were made from revenue payers and enforced by coercion exercised through the police than were made from and met by revenue payers of other villages of the Bardoli Taluka. The Government of India in consultation and full agreement with the Government of Bombay have decided, that an enquiry shall be held into this issue in accordance with the following terms of reference: "To enquire into the allegations that Khatedars in the villages in question were compelled by means of coercion exercised through the police to pay revenue in excess of what would have been demanded if the standard had been applied which was adopted in other villages of the Bardoli taluka where collections were effected after March 5, 1931, without the assistance of the police, and to ascertain what sum, if any, was so paid." Within the terms of reference, evidence may be produced on any matter in dispute. The Government of Bombay have appointed Mr. R. G. Gordon, I. C. S., Collector of Nasik, to hold the enquiry.

OTHER COMPLAINTS

4. In regard to other matters hitherto raised by the Congress the Government of India and the local Governments concerned are not prepared to order any enquiry.

5. In regard to any further matters of complaint by the Congress not coming within the specific provisions of the Settlement, such complaints will be dealt with in accordance with the ordinary administrative procedure and practice, and if any question of an enquiry arises, the decision as to whether an enquiry shall be held and if so the form it shall take will be made by the Local Government concerned in accordance with such procedure and practice.

The Government of Bombay's Communique.

5th October 1931.

No. 5387/28. The Governor in Council is pleased to appoint Mr. R. G. Gordon, I.C.S. to be Special Officer in connection with the Bardoli Inquiry described in the Government of India communique, dated 28th August 1931.

No. 5387/28(a). In Exercise of the powers conferred by Section 19 of the Bombay Land Revenue Code 1879 (Bom. V of 1879) the Governor in Council is pleased to confer upon Mr. R. G. Gordon, the officer on special duty for the purpose of the Bardoli Inquiry described in the Government of India communique dated 28th August 1931, all the powers of a Collector under the Land Revenue Code within the limits of the District of Surat.

CASE FOR BARDOLI

Case for Bardoli

Opening of the Inquiry

The Bardoli inquiry commenced to-day (5th October 1931) before Mr. Gordon at the Dak bungalow in Bardoli. The Government was represented by the Government pleader of Surat. Mr. Bhulabhai Desai, Sardar Vallabhbhai Patel, the Congress President and other Congress workers were also present.

The Inquiry Officer read out a short statement stating his appointment, the terms of the reference and the notification he had issued and the points for determination. He thereafter asked the credentials of the different persons who claimed to appear at the inquiry. Mr. Bhulabhai Desai said that he appeared for the Congress and the Khatedars concerned. Diwan Bahadur Thakorram objected stating that Mr. Desai's appearance was unauthorised and irregular. He argued that the Congress by its constitution could only appoint a legal representative by a resolution passed at a special session of the Congress and the Khatedars had not given a Vakalatnama to Mr. Desai. Mr. Desai replied stating that Mahatma Gandhi as the accredited representative of the Congress arrived at the agreement with the Viceroy under which this inquiry was agreed upon and that Mahatma Gandhi had openly and verbally instructed Mr. Desai to appear for the Congress at the inquiry and he contended that that was quite sufficient authority. He further supported his right to appear by contending that the President of the Congress for the year had the right to nominate Mr. Desai to appear for the Congress as Sardar Vallabhbhai had done. After hearing arguments the Inquiry Officer over-ruled the objection of the Government pleader. Thereafter Mr. Desai gave an opening statement of his case. The procedure was to be regulated by the terms of Section 197 of the Land Revenue Code.

Mr. Desai gave a list of 16 villages to be included in this inquiry as being the villages where police were employed for revenue collection. D. B. Thakorram on behalf of the Government agreed as to the presence of the police in 10 out of the 16 villages. The villages in which the presence of the police is not disputed will be first taken up for inquiry.

When Mr. Desai's appearance was objected to, he was obliged to give an explanation as to his right to appear for certain Khatedars of the village of Khoj. He stated that 22 Khatedars of Khoj had signed statements to the Congress workers. Of them 7 were only witnesses and the remaining were complainants. It had come to Mr. Desai's knowledge that of the remaining 15 signatories to the statements some 5 or 7 had been made to put their signature to a document stating generally that they had paid the revenue without any coercion from the Police. Such statement was got signed by them by the Patel of the village between mid-night and 4 A. M. on the 2nd instant. On that day one of the leading Khatedars of the village who was in police custody upto 11 P. M. that day was released and Mr. Desai has been informed that it was through him that influence was exercised on the persons who signed the writing referred to above. Mr. Desai however stated that he would depute a responsible man and find out from them whether they wished him to appear for them and make a statement on this point when the inquiry into the complaints of the Khatedars of Khoj will be taken up.

Mr. Desai further agreed to give particulars of the Khatedars of the several villages concerned and the general nature of their complaints.

The inquiry will be resumed on Thursday when evidence relating to the complaints of the Khatedars of Rayam will be taken up.

Mr. Bhulabhai Desai's Opening Address

During the course of the Civil Disobedience Movement the no-tax campaign was adopted and carried out among others by the Khatedars of Bardoli and Borsad Talukas. The Khatedars of several villages migrated out of British Territories and in most of the instances the crops remained unharvested or if harvested the yield was comparatively small.

As a result of conversations between Mahatma Gandhi and Lord Irvin an agreement was entered into which was published in the *Gazette of India* dated the 5th March 1931 whereby a truce was declared. The material portion of that agreement was as follows :—

“16. (a) Moveable property which is not an illegal possession and which has been seized in connection with the Civil Disobedience Movement, under the Ordinances or the provisions of the Criminal Law, will be returned, if it is still in the possession of Government.

(b) Moveable property forfeited or attached in connection with the realisation of land revenue or other dues will be returned unless the Collector of the District has reason to believe that the defaulter will contumaciously refuse to pay the dues recoverable from him within a reasonable period. In deciding what is a reasonable period, special regard will be paid to cases in which the defaulters, while willing to pay, genuinely require time for the purpose and if necessary the revenue will be suspended in accordance with the ordinary principles of land revenue administration.

(c) Compensation will not be given for deterioration.

(d) Where moveable property has been sold or otherwise finally disposed of by Government, compensation will not be given and the sale proceeds will not be returned except in so far as they are in excess of the legal dues for which the property may have been sold.

(e) It will be open to any person to seek any legal remedy he may have on the ground that the attachment or seizure of property was not in accordance with the law.”

Soon after the conclusion of the agreement Mahatma Gandhi and Sardar Vallabhbhai and the other Congress workers felt it their duty to facilitate and assist in the collection of the land revenue which had remained unpaid and Mahatma Gandhi and Sardar Vallabhbhai devoted a considerable portion of their time and energy in this matter. After considerable collections had been made in Borsad and Bardoli Talukas, defaulters' notices were issued on several Khatedars in the Bardoli and Borsad Talukas. From time to time Mahatma Gandhi had publicly called upon verbally or by written communications the peasants to pay up the taxes according to the measure of their respective abilities. One of the typical appeals is annexed hereto and marked A and a translation thereof is as follows :—

“To the Khatedars of the Kaira District,

With reference to my writing in 'Navjivan' that no Khatedar is obliged to pay revenue by incurring debt I write the following with a view to make the matter more clear.

1. Whether the Khatedar has gone in 'Hijarat' or not but if he has suffered substantially by reason of Satyagraha movement such Khatedar is not obliged to pay revenue by incurring debt.

2. Those who have not taken part in the Satyagraha movement or having taken such part have not suffered substantially, the duty of such Khatedar is to pay the revenue even if it becomes necessary to incur debt for such purpose.

3. The Khatedars covered by item No. 1 should realise that in my opinion their interest lies in keeping the truce. I shall make every endeavour to get suspension of their land revenue upto next year but if I fail the peasants will have to undergo considerable suffering and this suggestion does not apply to those who are not prepared to undergo such suffering."

All these appeals were issued with the tacit if not an active approval of the District Officers.

During the course of the correspondence with Mr. Perry, the then Collector of Kaira, Mahatma Gandhi defined his view of 'the ability to pay' as 'ability to pay without having to resort to borrowing after the peasant's actual tangible means were exhausted' and Mr. Perry agreed with that view. Relevant portions of the said correspondence are as follows :—

Letter from Mahatma Gandhi to Mr. Perry dated May 3rd, 1931.

* * * *

"It is common cause between us—that the people should pay revenue to the utmost of their capacity. I know that in defining the word 'capacity' there may be difference or there is a difference as I now see from your letter. During our talk I thought that you agreed that no one need borrow money in order to pay the revenue dues. I am carrying out that healthy formula. I know that it has not been carried out before and may not be carried out in future. In any case for this exceptional year I think that there is no way out of it as I hope to show conclusively in due course. This of course does not mean that those who wish to pay by borrowing should be prevented by me from doing so. Only I could not take it upon me to press them to do so."

* * * *

Letter from Mr. Perry to Mahatma Gandhi.

* * * *

"I agree with you about borrowing on interest. We do not exclude I think arrangements amongst friends or the like.

* * * *

Mahatma Gandhi made similar appeals to the Khatedars of the Bardoli Taluka and the response was very great. A very large portion of the revenue of the Bardoli Taluka and the Valod Mahal was paid up by the Khatedars at the request and with the assistance of the Congress organisation before the end of June. Even then Mahatma Gandhi and Sardar Vallabhbhai did not spare any efforts to invite further payments within the measure of the ability of the Khatedars.

After the first large collections were made correspondence took place from time to time objecting to the use of any coercive processes against the Khatedars to exact further payments. During the course of that correspondence Mahatma Gandhi made it clear that though no remission was asked for on account of the voluntary sufferings of the peasants during the Civil Disobedience movement the fact of actual privation of their means could not possibly be ignored in considering the question of their ability to pay particularly because of the Gandhi-Irvin Pact.

Rains set in on or about the 10th of June in the Bardoli Taluka and sowing or transplanting operations commenced in or about the beginning of July.

On the 8th of July a police party raided the village of Varad practically supplanting the revenue officers in the matter of collecting land revenue. From the 17th of July onwards regular police campaign was inaugurated for the purpose of revenue collections. The villages concerned were the following :

Rayem, Khoj, Pardi, (Kadod) Moti Farod, Timberwa, Rajpara-Lumbha, Vaghech, Bardoli, Vakaner, Manekpur, Shiker, Syadla, Alghat, Jamnia, Goddha, Navafalia (Valod).

On receiving information Sardar Vallabhbhai wired to Mahatma Gandhi about the police raids and the illegal means employed for collecting further revenue as Mahatma Gandhi had then gone to Simla. The telegrams were as follows :—

Bardoli 17th July 1931

Mahatma Gandhi, Simla.

Since Surat interview pressure collection increased probably after reference Commissioner stop Collector arrived here last evening local revenue authorities with Ismail Desai and fifteen police constables raided Rayam village for collection previous years arrears attached property including cots beds cooking utensils belonging Daya Kala who had already paid current years revenue all attached property removed stop peasants in midst agricultural operations find themselves between devil and deep sea urgent solution one way or other imperative.

Vallabhbhai.

Bardoli 20th July 1931

Mahatma Gandhi, Simla.

Since my last telegram village raids continue Police parties raided several villages to-day. Wire probable arrival.

Vallabhbhai.

Bardoli 21st July 1931

Mahatma Gandhi, Simla.

Police broke open backdoor of a Mohomedan of Bardoli two children hurt property taken out for twentyfour rupees arrears for frost year he had paid last year two years full dues similar attachments for past arrears continue.

Vallabhbhai.

Bardoli, 21st July 1931

Mahatma Gandhi, Simla.

Police persecution becoming intolerable crowds of peasants rushing Ashram with complaints yesterday several families of Sankali remained closed doors police petrolling in front all day several Timberva peasants not allowed to work by police had to go other villages and borrow money heavy interest Rajpura peasants dragged to Timberva by police to-day reports received that Khoj and Pardi villages completely surrounded by police since early morning neither people nor cattle allowed to go out complete blockade of those who owe money police posted several houses Bardoli town blockading entrance men women complain filthy abuses harassment for Gods sake allow fight if this cannot be stopped. Vallabhbhai.

The Khatedars in all the villages abovementioned where Police were employed have given statements to the Congress Organisation and the circumstances attending the police raids and the manner in which each individual was coerced into making the payment which he or she did and the amount thereof. So far as the Congress Organisation is aware there is no other Khatedar who has a complaint to make in connection with this matter and after the preliminary discussion as to the procedure the Congress Organisation will furnish the particulars of the Khatedars and the villages from time to time as they are taken up for inquiry.

The result of the conversations at Simla is embodied in the communique which is as follows whereby among other measures the Congress requisition of demanding the present inquiry was agreed to. The communique is as follows :

"In regard to collections of land revenue in the Surat District the point in issue is whether in those villages of Bardoli Taluka and Valod Mahal which were visited by revenue officials accompanied by a party of police during the month of July 1931 more severe demands having regard to their material circumstances were made from revenue payers and enforced by coercion exercised through the police than were made from and met by revenue payers of other villages of the Bardoli Taluka. The Government of India in consultation and full agreement with the Government of Bombay have decided that an inquiry shall be held into this issue in accordance with the following terms of reference.

Terms of Reference

To inquire into the allegations that Khatedars in the villages in question were compelled by means of coercion exercised through the police to pay revenue in excess of what would have been demanded if the standard had been applied which was adopted in other villages of the Bardoli Taluka where collections were effected after March 5th 1931, without the assistance of the police and to ascertain what sum if any was so paid.

Within the terms of reference evidence may be produced on any matter in dispute.

The Government of Bombay have appointed Mr. R. G. Gordon, I.C.S. Collector, Nasik to hold the inquiry."

Thereafter Mr. Gordon the Inquiring Officer issued the following publication on the eve of the opening of the inquiry :

"The Government of India in consultation with the Government of Bombay had agreed in their public despatch, dated August 28, 1931 to order inquiries into the allegations made in connection with the land revenue collections in some of the villages of Bardoli Taluka and Valod Mahal of the Surat District. This inquiry will begin on October 5, 1931 at Bardoli town.

The terms of reference for this inquiry are as follows and they will be strictly adhered to:—"After March 5, 1931 the land revenue collections were made without the help of the police in the villages of Bardoli Taluka. Allegations have been made that demand was made for a larger land revenue from the Khatedars of certain villages and that they were forced to pay more by coercion through the police, than what they would have paid if the method adopted in the other villages was resorted to.

An inquiry into these allegations and as regards the total amount of additional land revenues thus collected will be made. Subject to these terms of reference evidence can be led on the disputes in question.

A preliminary discussion regarding the method of the inquiry to be followed will take place at Bardoli. Thereafter a visit will be paid to these villages. All proofs and evidence subject to these terms of reference will have to be led and the necessary issues of the inquiry will be raised.

If any man or a public body or a society wishes to correspond with the Inquiry Officer he should send the communication to him to the address of the Office of the Collector of Nasik District upto September 30th, thereafter he should either write or see him personally at Bardoli Camp."

The points for determination in the inquiry therefore are :—

1. Whether the police was employed in connection with the collection of land revenue in the above mentioned villages.
2. What were the acts and conduct of the police officials and subordinates in connection with these matters.
3. What was the amount of revenue collected from the Khatedars as the result of employment of the police.
4. Whether the revenue so collected was in excess of what would have been collected if the standard which had been applied to other villages was observed in reference to the villages in question—or in other words—was any revenue paid in excess of what would have been paid, by reason of the employment of the police which was an illegal method not sanctioned by the Land Revenue Code.

As regards the 'standard' it has been maintained throughout the assistance given by the Congress in connection of land revenue after the truce that the only fair and sensible standard to adopt is the measure of individual ability to pay having regard to the actual financial state of the Khatedar concerned (not omitting from consideration the fact that his means had suffered by reason of the Hijrat.)

Within two days after the inquiry was agreed to Mahatma Gandhi proceeded to England and it became necessary to get a statement from him relating to the basis of the Agreement. Mahatma Gandhi has sent the following statement :—

"With reference to the revenue collections in Bardoli and Borsad it was from the very beginning a clear understanding that the Khatedars

affected by the Civil Disobedience were to pay only as much as they could without borrowing. This was repeatedly brought out in the conversations between the Collector Mr. Perry of Kaira and his successor Mr. Bhadrapur and Mr. Kothawalla Collector of Surat. The correspondence carried on with them confirms this statement. So far as the terms of reference to the Inquiry Officer are concerned I have distinctly understood that the standard referred to therein means ability to pay without borrowing".

From the general trend of the public statements, it appears that the Government seek to justify the presence of the police on the ground that they were taken to different villages as a means of protection to the Revenue Officers, that the Revenue Officers alone carried out the revenue collection operation and that the police took no part in any such measures. It is further stated that the measures were taken against persons who were able to pay, but contumaciously declined or refused to pay. The payments which according to the statements given by the Khatedars concerned were recovered between the 17th and 24th under coercion and by resorting to measures not sanctioned by the Land Revenue Code and with the assistance of the police or by the police have been claimed by the Government as payments which were made voluntarily and promptly as soon as it came to be known that coercive processes would be adopted and also as showing that the Khatedars who paid were well able to pay. The Khatedars deny this version and the method and means by which revenue was collected with the assistance of the police between the 17th and the 24th of July in the several villages abovementioned. They maintain that the recoveries were made by police coercion and illegal processes and that the payments made were beyond their ability to pay.

These are substantially the two versions of the events which have got to be tested in this inquiry. For the purpose of giving a fair outline of the case I am giving below the details of two villages of Rayam and Timberwa.

RAYAM

This village was raided on the 17th of July 1931. The raiding party consisted of the Mamlatdar, Mr. Esmail Desai, Deputy Superintendent of Police, Sitaram Jamadar and Dayabhai a clerk, Patel and Talati and 15 to 20 constables. It was raining on that day and the Khatedars were busy in their fields transplanting rice. The raiding party arrived at the village at about 10 in the morning and Vethias were sent out to the fields to call the Khatedars and the Khatedars were asked to accompany them to the Saheb. Police were posted at the house of various Khatedars and nobody was allowed to enter such house or go out of it. The Khatedars on returning from the fields were not allowed to enter their respective houses. Demand notices were handed to them there and then and they were asked to make payments immediately, and were informed that unless they did so they would not be allowed to go into their houses. The police would not allow food to be taken to the fields where Dublas were working and the Dublas remained without food.

The police made attachments on two houses and all the articles were taken out in the street and left in the rain. Among the articles so attached were those which were not liable to attachment under the Land Revenue Code. In case of one of the persons the articles were returned on his making payment of Rs. 25. Only Re. 1 was found from among his articles. In the case of the other articles worth about Rs. 600 including unattachable articles are still in the police custody in the village Chora. This Khatedar had paid Rs. 235 towards his

current year's dues out of Rs. 272 and he was given credit for Rs. 27 recovered from the sale proceeds of his rice stack taken in attachment. The rice stack was worth about Rs. 350. Rs. 6-1-9 were found in cash among the articles taken from his house.

In case of two other Khatedars a police broke open the locks of their houses and no Punch was called. The village people were generally abused and a threat was held out that the properties of those who did not pay up the arrears of revenue in full would be sold away and their lands would be lost like those in the village of Babla.

In the case of Khatedar Bhikha Kalian his lands were forfeited and sold and the crops were taken up by the purchaser. It now appears that through some error in the sale deed two small plots of 21 and 31 Gunthas were not included and they continued to remain therefore in his name. The Khatedar was under the belief that as his lands were all sold away he had not any land revenue to pay the more so because he knew that all the crops had been taken away by the purchaser. This Khatedar was called upon to pay Rs. 43-0-10 presumably the revenue attributable to the portion not included in the sale deed. He ultimately paid Rs. 5 under protest when the police were removed from his house where they were posted.

TIMBERWA

This village was raided on the 20th of July 1931 early in the morning. The raiding party consisted of Mr. Dave, the Aval Karkun, Mr. Shaikh, the Fozdar and about 12 to 13 policemen. The police were posted at various houses in the village and cattle were not allowed to be taken out for grazing and some were actually driven back. It had been raining and transplanting was going on and the villagers and their Dublas were not allowed to go out to their fields. Vethias were sent to fetch those who had left early and after this detention of the Khatedars and their cattle threats were given by the police that if the Khatedars did not pay up the arrears of revenue in full their property would be attached and sold away. The police entered some of the houses of the Khatedars who will give evidence before the Inquiring Officer. Being terrorised by the above threats the Khatedars borrowed several sums of money and made payments beyond the measure of their ability to pay.

This statement of the case will I hope be sufficient to enable us now to discuss the outline.

Argument as to the Admission of Six Villages to the Inquiry

The question is whether the six villages Rajpura-Lumbha, Manekpor, Nava Falya (Valod), Goddha, Alghat and Jamania, or any of them fall within the terms of reference to the Inquiry Officer. It is submitted that every one falls within the terms of reference having regard to the particulars of statements and allegations made on behalf of the khatedars of those respective villages. Portions of clause 3 material to the present question are as follows :

"In regard to collections of land revenue in Surat District, the point in issue is whether in those villages of Bardoli taluka and Valod Mahal which were visited by revenue officials accompanied by a party of police during the month of July 1931, more severe demands, having regard to their material circumstances, were made from revenue payers, and enforced by coercion exercised through the police than were made from and met by revenue payers of other villages of the Bardoli Taluka."

An enquiry shall be held into this issue in accordance with the following terms :—

"To inquire into the allegations that khatedars in the villages in question were compelled by means of coercion exercised through the police to pay revenue etc."

The villages in question therefore are those which are referred to in the earlier part in describing the issue. It is submitted that any village in which revenue collections were made in the month of July by revenue officials accompanied by a party of police should fall within the terms of the enquiry so long as that is the allegation of the Congress and the khatedars concerned. In this matter a certain amount of emphasis was laid on the word "visited" in the first part of clause 3. It would be too literal to say that where a revenue official was in fact in the village and the police went and assisted him in revenue collections the case does not fall within the enquiry though even in the event of such a literal construction being applied, there is hardly a village among the six that does not fall within the terms of the enquiry.

Taking the villages in order :

RAJPURA-LUMBHA

This village is at a distance of a mile from Timberwa which was raided on the 20th of July 1931 and the general particulars filed show that the operations in Rajpura-Lumbha were merely extensions of the operations in Timberwa as to which there is no question that it was visited by revenue officials accompanied by a party of police. Further the police who were sent to Rajpura took along with them the first complainant Vallabh Nagar to Timberwa.

MANEKPOR

This village was raided by the police on the 24th and the 25th July accompanied by the non-resident Patel and Talati and from the particulars filed it is clear that the revenue officials accompanied by a party of police carried out the operations complained of. The operations are more particularly described in the detailed particulars filed which also bear out the same contention.

NAVA FALYA OF VALOD

This village was visited by the police party on the 23rd of July along with Mr. Gulabbhai, Mahalkari. On the 23rd the party consisted of the Mahalkari, the Deputy Superintendent of Police and constables. The particulars also show that on the 24th of July the non-resident patel, the non-resident talati and the fouzdar carried out the operations.

GODHA

This village was raided on the 16th of July 1931. The revenue officials who took part in the operations in that village were the Patel who belongs to the place, along with a party of police headed by Keshav Nayak of Buhari Thana. The money was collected by the Patel and he took it to the Talati, and the receipts show that he paid the amount. The case therefore falls within the enquiry.

ALGHAT

In this village the exactions complained of were made within the 15th and the 24th July 1931 and the party consisted of the non-resident Patel, the non-resident Talati and the police headed by Keshav Nayak.

JAMANIA

The acts complained of in this village took place between the 15th and the 24th of July 1931 and the party consisted of the resident Patel, the non-resident Talati and a party of police headed by Keshav Nayak.

Order**BEFORE THE INQUIRY OFFICER, BARDOLI**

The question at issue is whether all or any of the villages noted below can be considered to fall within the scope of the terms of reference for the purpose of admission to this inquiry in addition to those villages already admitted :

Rajpura-Lumbha
 Manekpur
 Nava Falia
 Goddha
 Alghat
 Jamania

Of these the village of Nava Falya has been admitted by agreement. It only remains therefore to consider the cases of the other five villages.

2. In my opinion none of these villages can be considered to fall within the scope of the terms of reference as interpreted by communique of the Government of India. My reasons are as follows :

3. The important words are those giving the definition of the villages falling within the terms of reference as those villages 'which were visited by revenue officials accompanied by a party of police during the month of July 1931'. It is clear to my mind that the definition refers to organised expeditions of combined forces of Revenue officers and police such as we have in the case of the ten villages already admitted to the inquiry. In these cases the combined force came together and, so far as the arrival and purpose was concerned, was a unit. In all these cases the Revenue and Police officers were responsible officials of standing.

4. In my opinion it is organised expeditions of this kind alone that the communique meant to include within the scope of the terms of reference. If this were not the case then the scope of these terms would be liable to indefinite extension. The mere allegation that while the talati was collecting revenue one police constable told a villager or two to pay up would be sufficient claim to inclusion. None of the villages now in question seem to me to fall within this definition. No argument is necessary about the village of Goddha, Alghat and Jamania and the alleged visits of the Naik of Buhari Thana, extending in the case of the last two villages over a period of 9 days each, as they clearly do not fall within the definition as given above.

5. As for Rajpura-Lumbha and Manekpore in neither case is there evidence regarding the visit of a combined force of revenue and police as a unit. In the case of Rajpura-Lumbha, it is claimed to be an extension of the operations in Timberva, but I am unable to allow this principle of extension to be introduced. The terms of reference have to be interpreted strictly and as there was admittedly no visit of a combined force the village does not come within the terms of reference. As for Manekpore, here again it is sought to apply the principle of 'extension,' without the presence of responsible revenue officers, who are 'accompanied' by police.

3-11-31.

(Sd.) R. G. GORDON,
 Inquiry Officer,
 BARDOLI.

Statement Re : "Standard"

Bardoli, 22nd October 1931.

Dear Mr. Gordon,

With reference to excess recovery of authorised arrears in the case of Gopal Bhawan of Timberwa, Mr. Lala had an interview with Mr. Almoula and the explanation given was that the 10th December 1930 was the date fixed by the Collector for payment of the first instalment. The khatedar not having paid the current year's dues and the dues for the immediate preceding year, under the rules, his authorised arrear of 1928-29 became unauthorised, that is, he lost the right to suspension. Mr. Almoula further explained that in July the Government, by a confidential order, ordered that if a khatedar paid his dues for the current year and the year immediately preceding, his suspension should be restored, that is to say, what was originally authorised arrears and became unauthorised as above stated, should be reauthorised.

Taking into consideration the recoveries made on the day of the raid, the sum recovered from him was more than sufficient to cover the authorised arrear. It is not known what is the date of the confidential Government order referred to in the explanation. Mr. Almoula thereafter had an interview with me yesterday evening and told me that he wanted to correct certain mistakes, irrespective whether they were on the part of Mr. Almoula or on the part of Mr. Lala, which had occurred in the explanation. He informed me that the authorised arrears became unauthorised under a revenue rule in that behalf. He further informed me that the authorised arrears which had become unauthorised in the interval became reauthorised in the month of July, not in pursuance of a confidential Government order made in July but in pursuance of an order or orders of an earlier date. Of these latter he did not give any particulars. He subsequently wrote to me stating that the authorised arrears became unauthorised in the first instance not under a rule but in virtue of an administrative order. I have no particulars of any of these orders or documents. I am unable in this state of facts to accept the explanation if it is meant to convey that on the day of the raid the recovery made so as to cover the original sum of authorised arrears was proper in any respect. I should also add that even if the arrears were unauthorised the other question would still remain, whether the same could be recovered if the non-borrowing standard, which I maintain, is to be applied. This indirectly involves or may involve an examination of materials throwing light on the question of the standard referred to in the terms of reference, and it arises in this way :

On the 5th of March 1931 a notification (Political) was published by the Government of India, Home Department, over the signature of Mr. Emerson, Secretary to the Government of India. The notification states in Clause 1 as follows :

"Consequent on the conversations that have taken place between His Excellency the Viceroy and Mr. Gandhi, it has been arranged that the civil disobedience movement be discontinued, and that, with the approval of His Majesty's Government, certain action be taken by the Government of India and local Governments."

Clause 4 of the Notification is as follows :

"The Settlement relates to activities directly connected with the civil dis-

obedience movement," and clause 5.

"Civil disobedience will be effectively discontinued and reciprocal action will be taken by Government. The effective discontinuance of the civil disobedience movement means the effective discontinuance of all activities in furtherance thereof, by whatever methods pursued and, in particular, the following :

(2) The movement for the non-payment of land revenue and other legal dues."

Clause 9.

"The action that Government will take on the discontinuance of the civil disobedience movement is stated in the following paragraphs :

Ordinances promulgated were to be withdrawn.

Certain pending prosecutions were to be withdrawn.

And clauses 16 (b) and 17 (b) which are material for the purposes of this inquiry run as follows :—

"16 (b). Moveable property, forfeited or attached in connection with the realisation of land revenue or other dues, will be returned unless the Collector of the District has reason to believe that the defaulter will contumaciously refuse to pay the dues recoverable from him within a reasonable period. In deciding what is a reasonable period, special regard will be paid to cases in which the defaulters, while willing to pay, genuinely require time for the purpose, and if necessary, the revenue will be suspended in accordance with the ordinary principles of land revenue administration."

"17 (b). Land and other immoveable property in the possession of Government, which has been forfeited or attached in connection with the realisation of land revenue or other dues, will be returned unless the Collector of the District has reason to believe that the defaulter will contumaciously refuse to pay the dues recoverable from him within a reasonable period. In deciding what is a reasonable period special regard will be paid to cases in which the defaulter, while willing to pay, genuinely requires time for the purpose, and if necessary the revenues will be suspended in accordance with the ordinary principles of land revenue administration."

It should be here stated that by reason of the no-tax campaign which was a part of the civil disobedience movement as shown above, the bulk of the lands in the Bardoli Taluka including Valod Mahal and certain parts of the Kaira District, and all the standing crops thereon were forfeited or attached in connection with the realisation of the land revenue or other dues. It is provided that all the moveable property so forfeited or attached was to be returned unless the defaulter contumaciously refuses to pay the dues recoverable from him within a reasonable period. In the rest of the paragraph above quoted it is made clear that once the willingness to pay is found in the defaulter he is to be given reasonable time to pay the arrears of revenue irrespective of the periods for which it was due. It is further provided that if necessary the revenue was to be suspended in accordance with the ordinary principles of land revenue administration. It was understood that these principles would be applied liberally and that the application of the principles of suspensions of land revenue was to be *mutatis mutandis* to be applied to the special conditions of privation, suffering and loss due to the antecedent circumstances, as if it was a case of privation, suffering or loss by natural causes. Clause 16 (c) provides that compensation will not be given for deterioration. It is almost a necessary inference from that provision

that, while actual compensation will not be granted, the deterioration which was admitted to have occurred must be one of the main considerations in judging for what period the payment of the arrears of revenues should be suspended.

It was understood at the time of this agreement that instructions would be issued both by the Government of India and the local Governments to implement the terms of this Agreement between the Government of India and the Congress. The first point therefore to notice is that under the terms of the Agreement the Government had no option but to suspend the dues of the defaulters who, while willing to pay, genuinely required time for the purpose. Such instructions must presumably have been issued by the Government of India as well as the local Governments. I am not in possession of any of these documents except so far as the purport thereof was conveyed in conversation by those representing the Government to the representatives of the Congress. Such instructions which must have been issued from time to time upto the 28th of August, which is the date of the second agreement between the Government and the Congress, would and must throw considerable light on this question of the standard which is referred to in the agreement. I therefore submit that all these documents should be called for and examined before the general question of standard is determined. The clauses above referred to require, as has already been submitted, an investigation of the ability of each defaulter to pay, and he is entitled to relief for, among other reasons, his sufferings and privations due to the conditions arising from the civil disobedience movement. It must have been present to the minds of those who framed both the agreements that there must have been a total or partial loss of the crops by reason either of a hurried or premature cutting of the crops before the no-tax campaign started and the loss during the interval before their return. The defaulter has to satisfy two conditions, (a) an expression of willingness to pay which he may do by conduct in particular by paying even a small sum of money towards the dues recoverable from him and (b) his genuinely requiring time for payment of the balance. The second necessarily requires an investigation as to his depleted resources on account of all reasons including the effects of the civil disobedience movement. It is further submitted that on account of the special agreement the question of suspension does not merely relate to authorised arrears but to all arrears but the case of authorised arrears is necessarily a stronger case and almost unanswerable. In conclusion I should like to say again that our case is that, having regard to the terms of the agreement as examined above, no defaulter was to be obliged to pay except from his own depleted resources and therefore he was not to be obliged to pay if he had to borrow for the purpose of paying.

Yours Sincerely,
Sd. BHULABHAI J. DESAI

R. G. Gordon, Esq.

Bardoli,
31st October 1931

Dear Mr. Bhulabhai,

I have to reply to your letter of 22nd in which you refer to certain conversations between you and Mr. Almaula.

Into the questions which you raise regarding the interpretation of the agreement of March 5th I am unable to go. As I have remarked before the terms of reference do not authorise me to go into such matters. In the course of your letter, however, you ask me to call for all orders of the Government of India and the Government of Bombay which have been issued between March 5th and August 28th because they 'would and must throw considerable light on the question of the standard which is referred to in the agreement'—though by 'agreement' I presume you to mean the terms of reference. I must confess that I am unable to see why I should do this. By the terms of reference I am required to inquire into certain allegations made by the Congress that a certain standard has been violated. You yourself have stated that this standard is the 'no borrowing' standard and you informed me that you were prepared to prove this. Presumably before the Congress made these allegations they were in full possession of the material upon which they were based and it is for them to produce those materials and to prove their case. I am unable to see why Government should be asked to produce evidence to prove it for them. The Revenue authorities in Surat are, in a way, accused parties in this inquiry and it is not necessary for them to prove any particular standard. In any case it is obvious that no documents which came into existence after the date of the visits, supposing any such documents to exist, can have any possible bearing on the question of the standard which was in operation prior to that period. Of course if there is any definite order of Government which forms part of your evidence regarding the existence of the 'no borrowing' standard to which you desire to refer that is a different matter.

I may add that the copy of the letter which you sent me is neither signed nor dated. I should be glad if you could kindly send me a signed and dated copy for my record.

Your sincerely,
R. G. GORDON.

B. J. Desai, Esquire,
Advocate, Swaraj Ashram,
Bardoli.

Cross-examination of Mr. Krishnaial Lalloobhai, Mamlatdar

- Q. How long have you been the Mamlatdar of this Taluka ?
 A. From 19th July 1929.
- Q. You are in charge of the revenue collections in the Taluka ?
 A. Yes.
- Q. As regards these 11 villages in question do you accept or deny that there were organised expeditions of combined forces of revenue officers and police ?
 A. I deny it.
- Q. Was the arrival and the purpose of these visits a unit ?
 A. I do not understand the question.
- Q. You are a first class magistrate ?
 A. Yes.
- Q. You deliver your judgments in English ?
 A. Yes.
- Q. In so far as the visits in question are concerned was the arrival and the purpose a unit ?
 A. No.
- Q. In case of Rayam was there a combination of the revenue officials and the police or not ?
 A. No.
- Q. You say that each of the two groups went entirely on their own without any previous arrangement ?
 A. I went for collection work and took the police with me.
- Q. I will repeat to you the question and I want a definite answer. Do you say that the two groups, namely the revenue officers and the police reach the village without any previous arrangement ?
 A. (Replied in Gujarati)
- Q. When was this arrangement made ?
 A. On the morning of the 17th.
- Q. Between whom was the arrangement made ?
 A. Between myself and Khan Bahadur.
- Q. When did the Collector Saheb arrive in Bardoli ?
 A. On the 15th or the 16th.
- Q. Did you take any orders from him as regards this arrangement ?
 A. No.
- Q. Did you inform him of the arrangement that you made or intended to make ?
 A. No.
- Q. Do you suggest that the Collector Saheb was ignorant of this arrangement ?
 A. He might have heard when I was away from the headquarters.
- Q. This was the rainy season ?
 A. Yes.

- Q. Transplanting time ?
A. Yes.
- Q. Is it usual for the District Officer to visit a village during this season ?
A. No.
- Q. So except in connection with an important event or purpose he would not visit ?
A. Yes (Sir).
- Q. You get intimation of such a visit ?
A. Generally we do get.
- Q. Was this visit in connection with any special purpose ?
A. That I do not know.
- Q. How long did the Collector remain on this occasion ?
A. Upto the end of July with a break.
- Q. Do I understand you to say that you did not come to know at all of the purpose of his visit during his stay in Bardoli ?
Court : How is he to know whether the purpose was special or not ?
- Q. Did the Collector mention to you either the special or the important purpose on which he came ?
A. He never communicated either the special or the important purpose.
- Q. Do I take it that you did not even know during this period that he was one of the members of another expedition to Vagech ?
A. We were going to Vagech and he accompanied us to see how we were working.
- Q. I want a direct answer to my question.
A. No.
- Q. To visit Vagech was not the object ?
A. That was not the object.
- Q. You remember that during the period of 7 days (between the 17th to the 23rd) 11 villages were visited by a combined group of revenue officials and police for the purpose of revenue collections ?
A. Yes.
- Q. Are you aware that the Collector left on the 24th for the District Town i.e. Surat ?
A. I do not remember the exact date. He returned after the last visit.
- Q. Were you telling the Collector every day the result of these expeditions ?
A. No.
- Q. Do I take it then that during the time that the Collector was here no report was given of these things ?
A. I did report of the collections made every day. I told him also that each time I was accompanied by the police.
- Q. You arranged for the accompaniment of the police at these expeditions ?
A. I did except in cases of the villages which were visited by the Aval Karkun.
- Q. With whom was the arrangement made ?
A. With Khan Bahadur. In his absence with the Police Sub-Inspector.

- Q. So far as you recollect for how many days was the Khan Bahadur absent from Bardoli during this week?
- A. He was not out of Bardoli during this week.
- Q. Do you like to revise your answer that the arrangement was made with him when he was present and with the Sub-Inspector whenever he was absent?
- A. Not always.
- Q. Were these arrangements with reference to the use of the police during the week made in advance?
- A. We have general permission from the Collector to take the police with the revenue officials whenever required.
- Q. That permission I take it refers to what are called the sepoy's?
- A. The sepoy's and the officers also.
- Q. Is this permission in writing?
- A. No.
- Q. When were these instructions given?
- A. I do not remember any such instructions being given to me within the two months.
- Q. Do you suggest to the Court that these instructions enable you to even request Khan Sahib to accompany you with a party of police for revenue collections?
- A. Yes.
- Court:** What do you mean by "for the purpose of revenue collections?"
- Mr. B.** When they went to collect revenue.
- Q. Shall I take it then in this way, that after the 5th of March 1931, you had no such instructions given to you?
- Court:** He said permission and you use the word instructions.
- Q. At any time had you any permission?
- A. No.
- Q. Were you ever permitted or instructed to request the officers to accompany revenue officials when they went for revenue collections?
- A. I had permission to request the officers.
- Court:** He has already said that.
- Q. Were they obliged to comply with your request whenever you chose to make it?
- Govt. Pleader:** It is not a question of fact.
- Q. Prior to this week were you ever accompanied by any other officer apart from the village of Varad?
- A. No revenue official had been accompanied by the police.
- Q. Do you say that the arrangement with regard to the accompanying of the police for the week made in advance or made from day to day? I want a very definite answer.
- A. The arrangement was made from day to day.
- Q. Quite sure about that?
- A. Yes, whenever I had to take up any village.
- Q. Had you any programme for the villages during the week?
- A. No.

- Q. I take it your answer is that each evening on return from a village you thought upon the villages for the next day for the purpose of visit.
- A. I used to watch the collections and in the evening or the next morning I used to select another village.
- Q. On what ground do you select a village either in the evening or in the morning?
- A. There was nothing like selection.
- Q. Then on what reason or principle did you select the village to be visited for the purpose of revenue collections?
- A. When I found that some pressure was necessary in a particular village. I used to get reports from village officers. I used to make the selection on the strength of the village officer's report.
- Q. You mean to tell me that it was because of the report of the previous day of that particular village officer that you selected the village?
- A. Not on that particular day's report only. On the previous reports also.
- Q. On which day's report did you act in the case of Rayam?
- A. I had received a report a month back as regards Rayam and thereafter a general report.
- Q. How long before you selected this village did you receive a report about Moti Falod?
- A. Four or six weeks back.
- Q. Timberwa?
- A. I had been to Timberwa myself some 15 days before.
- Q. Pardi and Khoj?
- A. I had been personally there.
- Q. How long before?
- A. A week or two before.
- Q. Vagech?
- A. I never had any written report. I had only oral reports.
- Q. As to Vankaner?
- A. No report. Only oral.
- Q. As to Pardi and Khoj was there any written report?
- A. Only oral report.
- Q. There were no written reports within a period very recent to the selection?
- A. No.
- Q. What was it that made you select the evening before or the next morning the village intended to be visited for the day?
- A. Wherever I found the collection poor.
- Q. Did you select any of these villages either on the ground that the aggregate collection was bad or on the ground of examining whatever the book is and finding that particular people required pressure?
- A. I selected the villages on the principle that particular people in the village required pressure.
- Q. Do you maintain a khatawai of each of the khatedars of each village in the taluka?
- A. No.

- Q. So except by inspection of that book or a written report how do you maintain your answer ?
- A. These villages were selected long before.
- Q. How long before ?
- A. In the beginning of June.
- Q. Did you select these eight villages among others in the month of June ?
- A. Yes.
- Q. You had decided in the month of June that these were the villages where certain khatedars required pressure ?
- A. Yes.
- Q. You had not visited all these villages in the month of June or prior to that ?
- A. I cannot say.
- Q. You equally can't say I take it that you had studied the khatedars of these villages ?
- A. We had prepared lists in the month of May of the defaulting khatedars of each village in the whole of the taluka.
- Q. No payments were made since then ?
- A. In some villages some of the people had started paying.
- Q. How did you select these villages ?
- A. Most of the khatedars in these villages did not make any start as regards the past arrears till the first week of July.
- Q. You selected these villages for that reason ?
- A. Yes.
- Q. The revenue year was coming to an end in a fortnight ?
- A. Yes.
- Q. Was it not a part of your programme to visit these villages in company with the police ?
- A. No.
- Q. Then what was it ? May I take it that from the 16th it was your programme during a part of the official year to expedite collection by issuing notices and other measures ?
- A. It was not my programme.
- Q. It would be necessary to utilise the permission that had been given to you to send the police each day with the revenue officials ?
- A. That I had decided a little earlier.
- Q. When had you decided ?
- A. Before the 16th I had decided that on each of these visits the revenue officials should be accompanied by the police.
- Q. And that was because of the incidents in April ?
- A. That was because of the assault on the Mamlatdar of Jalalpore, and similar incidents after March.
- Q. What had you decided ?
- A. Whenever I had to go for attachment or any coercive measures I should take the police with me,

- Q. Apart from taking any coercive measures you were perfectly, freely and safely moving in the taluka in the month of March ?
- A. Yes.
- Q. People always received you well ?
- A. Yes, so long as I was well with them. Whenever I talked about payment they speak like anything.
- Q. On the 12th of July you visited Timberwa with perfect safety and perfectly freely ?
- A. I do not remember.
- Q. Look at your diary and tell me to-morrow ?
- Q. Do I understand you to say that during the next fortnight after the 16th you were going to put pressure on the villages you had selected and employ the police to go with you ?
- A. Yes, I thought of visiting the village to put pressure on the defaulting khatedars accompanied by the police if I had to do attachments.
- Q. Had you or any of your officials made any attachments prior to the 17th of July since the 5th of March ?
- A. No attachments whatever.
- Q. I take it that you were being assisted by the Congress in making the collections ?
- A. No, on the contrary hindrance.
- Q. They did not enable you to recover what you did ?
- A. No, they were only telling the people that only the current dues were to be paid.
- Q. Can you point out to me any document or any speech to that effect ?
- A. Only reports in the newspapers.
- Q. You said you had prepared these lists in May. Why did you not do anything upto the middle of July ?
- A. I tried to persuade the people.
- Q. Was there any coercive measure intended to be taken as regards these eight villages other than attachment in July ?
- A. No.
- Q. If you never had taken any coercive measure in the shape of even attachment prior to July what put into your mind the idea of requiring the protection of the police ?
- A. Nothing but my surmise that the people would be offended by my attachment. The Vethias were being harrassed by the village people.
- Q. The Vethias, I take it, were ill-treated before the 16th.
- A. Yes.
- Q. You did not then think of the police ?
- A. In case of attachment I thought their cattle might be made to run away and they would prevent me from taking out the articles.
- Q. I take it that you availed yourself of this permission which was given to you. Did you make any report in connection with the intended help of the police ?
- A. No.

BARDOLI,
4th November 1931.

5-11-1931.

CROSS-EXAMINATION OF MR. KRISHNALAL LALOOBHAI—*contd.*

Q. Yesterday you referred to the assault on the Mamlatdar of Jalalpore. The case is still under enquiry?

A. Yes.

Q. All that occurred in that case even according to the allegation is that the Mamlatdar slapped the Patel and there were counter-complaints?

A. I do not know the facts about the incident.

Q. When was the Akoti incident?

A. In the month of June.

Q. The incident was this. I have got the judgment here. Several children in a primary school below the age of 10 or 11 threw a few pebbles because the Patel's wife abused them. Of the persons convicted 7 were children?

A. About that number.

Q. Then you talked about Vethias being illtreated. Can you name any definite village of which you have this complaint to make?

A. Twice the Vethias told me when I asked them to fetch the khatedars that the villagers were abusing them.

Q. What were the two villages concerned and the time?

A. Vankaner at the end of June and Rayam about the end of June.

Q. And you say these were the incidents which led you to come to the judgment that it was necessary to ask the police to accompany the revenue officials when attachments were in contemplation?

A. And because of their insolence also.

Q. Have you brought your diary and your reports?

A. I have not.

Q. I told you yesterday. Please send somebody and bring them.

Govt. Pleader : I think they should not be allowed to be produced.

Court to Cong. Counsel : You must ask for some definite documents.

Q. Prior to the month of July you used to send almost daily a report of the collections and the general condition?

A. 3, or 4 days afterwards.

Cong. Counsel to Court : My case is that on the 19th which was an intervening Sunday he actually went to a village and made collections unaccompanied by the police.

Court : You cannot ask all documents to be produced. You must ask for definite documents.

Cong. Counsel : When I get to dates I will ask for definite documents.

Court : I do not see why this diary should be produced.

Cong. Counsel : Supposing in the diary he has stated it is not possible to collect anything more without the assistance of the police?

Court : I am sorry I cannot see any reason why he should produce the diary.

Cong. Counsel to Court : I give notice under Order 12, Rule 8. Let the application be heard.

- Q. I asked you yesterday that on the 12th of July you visited Timberwa. Do you wish to look at your diary before answering this question?
- A. No.
- Q. Why not?
- A. Diary is not here.
- Q. Then get it. You promised to bring it to-day.
- Court to witness:* If you had promised to give a definite date after consulting your diary then you should have done so. You have not done so?
- A. No sir, I forgot to do so.
- Court to Cong. Counsel:* What do you want to do under the circumstances?
- A. I would persist in putting this question.
- Court to witness:* You do not remember the exact date on which you visited Timberwa?
- Witness:* In the second week of July I visited.
- Court:* You are certain that it was in the second week?
- Witness:* Yes.
- Court to Cong. Counsel:* Is this answer satisfactory?
- Cong. Counsel:* No Sir.
- Q. You can give me a definite date after consulting your diary. It is a very simple question?
- B. Yes.
- Court to Cong. Counsel:* Would you withdraw this matter for the present?
- Cong. Counsel:* If he wants to consult his diary I will postpone the question. I will leave that train of argument for the moment and carry on another point.

RAYAM

- Q. You remember you visited this village on the 17th?
- A. Yes.
- Q. When did you decide that you were going to visit Rayam?
- A. Eight or ten days before the Patel and the Talati had told me that it would be better for me to go.
- Q. You have got any note of that in writing?
- A. No.
- Q. Then you decided I take it that on a convenient day you will visit the village.
- A. Yes.
- Q. In the meantime, that is after the receipt of this information from the Patel and the Talati you did visit other villages?
- A. Yes, I did visit other villages, Timberwa, Pardi and Khoj.
- Q. At that time had you issued any notices to Timberwa, Pardi and Khoj?
- A. I should consult the records.
- Q. Will you please produce them?
- A. If the Enquiry Officer directs I shall do so.
- Q. When did you decide to issue notices about Rayam?
- A. In the third week of June *i. e.* in the previous month.

- Q. Had you got the notices ready at the time when you decided to issue them ?
- A. I had not got them ready.
- Q. When did you get them ready ?
- A. About the 16th of July.
- Q. There is no "about" about it. Kindly answer this question definitely.
- A. On the 16th.
- Q. What time of the day ?
- A. Before office hours.
- Q. In the morning then ?
- A. Yes.
- Q. What did you do with these notices ?
- A. I sent them to Rayam with the revenue Patel.
- Q. Did you sign them ?
- A. Yes.
- Q. How many notices had you prepared and signed ?
- A. 10 defaulters.
- Q. Where did you get the names of the 10 defaulters from ?
- A. I had no document from which I selected.
- Q. Had you any definite information in writing as to the capacity of each of these defaulters on the day when you decided to issue the notice ?
- A. I had nothing in writing to show me the capacity. On my general knowledge I prepared this list.
- Q. How many villages have you got roughly ?
- A. 93.
- Q. What is the average number of khatedars ?
- A. 100.
- Q. There are in all about 9300 khatedars ?
- A. Yes.
- Q. Were there more defaulters in this village than 10 ?
- A. Yes.
- Q. How many more ?
- A. About 30 more.
- Q. You tell me that without any definite knowledge as to the capacity of these 10, you still selected them for issuing this notice, a process which you had not employed almost till the end of the official year ?
- A. Nothing definite in writing.
- Q. Have you a note anywhere ?
- A. No.
- Q. The form of the notice is prescribed under the rules of the Land Revenue Code ?
- A. There is no form. Only for demand notices.
- Q. There is a form for a Demand Notice ?
- A. Yes.
- Q. The notice for a $\frac{1}{4}$ th fine is a severer measure than a mere notice for payment ?
- A. Yes.

- Q. And even in case of a notice of demand there is a fee chargeable for the notice ?
- A. Yes.
- Q. And the law requires that there shall be 10 days' notice in such a case ?
- A. Yes.
- Q. In the notices that you issued what form did you use ? Have you got a form here ?
- A. I adopted the same from a Demand Notice.
- Q. Then you realised that if the form remained you could not do anything the next day, *i.e.* you could not carry out the programme ?
- A. No.
When the same question was put in Gujarati he answered "Yes."
- Q. On that you struck out the words "within ten days" and put *Thurat* (immediately) instead ?
- A. Yes.
- Q. Why did you alter these words ?
- A. With a view to expedite the matter.
- Q. Is it because you wanted to carry out your programme for the next day ?
- A. No.
- Q. Can you give me any definite instance of which you can produce a record, while in case of a one-fourth fine you had not given any time whatever ?
- A. Yes, I will.
- Q. All right. Produce it then. In which year ?
- A. In 1930.
- Q. You did not think that it would be proper to give some time ?
- A. No.
- Q. As a matter of fact there were no notices in respect of Moti Farod ?
- A. There were no notices at all prior to the visit to Moti Farod.
- Q. Were any notices of demand issued in case of these defaulters at all ?
- A. No.
- Q. In other villages you had issued demand notices ?
- A. Yes.
- Q. Can you explain why without even issuing a demand notice you issued a one fourth fine notice for immediate payment ?
- A. I issued notices because I thought they were contumacious.
- Q. Then you had time enough to issue a notice of demand if you had chosen ?
- A. Yes.
- Q. Then why did you decide on this course on the 16th of July what I call a severer measure if you had information in June ?
- A. I gave them time.
- Q. Then why did you not issue a notice ?
- A. It was too late to give them time.

Q. Too late from what point of view ?

A. I adopted this measure because the revenue year was about to close.

Q. You wanted to squeeze out as much as you could within that fortnight ?

The Court objected to the use of the word "squeeze."

Q. Do you understand the word "squeeze" ?

A. Yes, I understand it.

Q. You did it to squeeze out as much as you could ?

A. No.

Court : What do you mean by saying "no" to this question ?

Witness : I did not intend to squeeze them out but I thought they would be responding to $\frac{1}{4}$ fine and possible attachment.

Q. Did you give any intimation of any kind or sort that the attachment would follow next morning ?

A. No.

Q. You intended that the attachment should take place the next day ?

A. Yes.

Q. You said you sent down these notices with the Patawala ?

A. Yes.

Q. When did you send them ?

A. Between 11 and 12 that day.

Q. May I ask you whether at this time, *i.e.* on or about the 15th or the 16th of July except in the villages in question did you issue any notice of $\frac{1}{4}$ fine with immediate payment ?

A. No.

Q. How long before had you issued any such notice ?

A. Before the 16th July some of the villages, and some after.

Q. Where ?

A. Vadoli, Menak, Pooni, Supa.

Q. But all began in July I take it ?

A. Yes.

Q. Which day in July ?

A. I must see the record.

Q. Then find it out and tell me ?

A. Yes.

Q. Who affixed these notices ?

A. I do not know.

Q. You do not know that these notices were actually posted on the doors of these defaulters ?

A. I do not know.

Court to Witness : They were not signed and brought to you in duplicate ?

A. No.

Q. Was any signature of any of the khatedars taken when the notice was served upon them ?

A. I do not remember.

- Q. You had no written record before you when you reached Rayam whether the notices were served or not ?
- A. No.
- Q. When did you reach there according to you ?
- A. At two.
- Q. I put it to you that you reached there at about 11 o'clock ?
- A. I deny it.
- Q. Have you got any note about it ?
- A. No.
- Q. What time did you call for the assistance of the police ?
- A. I informed Khan Bahadur in the morning.
- Q. What time in the morning ?
- A. Between eight and nine.
- Q. Where ?
- A. In Bardoli.
- Q. Did you send a written request ?
- A. No.
- Q. Why not ? Do you normally take the police with you ?
- A. No, inasmuch as I had already the permission, there was no need to make a request in writing.
- Q. Which is the permission you are referring to ? The permission of the previous year ?
- A. The permission of the previous year and a permission at the end of June.
- Q. Apart from the permission of the previous year there was only one permission namely at the end of June ?
- A. Yes.
- Q. When and where was this permission in June given ?
- A. At Bardoli in the end of June.
- Q. Was the Collector here at the end of June ?
- A. Permission was given either at Bardoli or at Surat.
- Q. You are quite sure it was at the end of June ?
- A. Yes.
- Q. Did you go to Surat at the end of June ?
- A. Yes.
- Q. To see the Collector Saheb ?
- A. Yes, the Collector and the District Judge.
- Q. To consult them as to what measures you should take in the collection of land revenue ?
- A. To study the land revenue condition.
- Q. How did the question of giving the permission arise ?
- A. The Collector said issue notices.
- Q. Where was this interview ?
- A. At his bungalow.
- Q. What was the notice ? Demand Notice ?
- A. Demand Notice as well as $\frac{1}{2}$ fine.

- Q. Did he put any of these directions in writing ?
 A. He did.
 Q. Then how did the question arise about permission for the employment of police ?
 A. I talked about the incident of the Mamlatdar at Jalalpore and about the general atmosphere. The permission I got was that if there was occasion to levy attachments I may use three or four policemen.
 Q. What permission. Was it in writing ?
 A. No.
 Q. Was it communicated to Khan Bahadur by you when you arrived from Surat ?
 A. Yes.
 Q. You informed Khan Bahadur ?
 A. Yes.
 Q. You said you did not make any request in writing ?
 A. No.
 Q. You went personally ?
 A. Yes.
 Q. What did you tell him ?
 A. (in Gujarati).
 Q. What did he say ?
 A. Either I will come or the Foujadar will come.
 Q. How many of you did in fact go ?
 A. 10 or 11.
 Q. Who were they ?
 A. 6 policemen, myself, Circle Inspector, Patawala, Khan Bahadur and Police Sub-Inspector.
 Q. You were in charge of these. Did you supply the facts to Diwan Bahadur on which the Government case on Rayam had been framed ?
 A. Yes.
 Q. The facts stated in that reply are true ?
 A. Yes.
 Q. It is also true according to you (reads a passage from the Government case and asks whether that was true ?)
 A. Yes, the three people referred to in the Government reply paid after I left.
 Q. You have already told me that the receipts were made out as people came and paid ?
 A. Yes.
 Q. Will you please produce your counterfoils ?
 The counterfoils were brought.
 Q. The first receipt is for Rs. 43 by Bai Kunvar, Widow of Hansji Lala ?
 A. Kunvar's receipt is the first.
 Q. Therefore your statement that she paid after you left cannot be true ?
 Do you deny that the receipts were made out as the monies were paid in ?
 A. In my presence the receipts were made out.

- Q. Do you mean to tell me that when you began to make out receipts you left blanks in the beginning ?
- A. No.
- Q. At least the first one was made out in your presence ?
- A. No.
- Q. What happened ? Was no receipt made out in your presence ?
- A. Two or three receipts were made out in my presence but not the first one.
- Q. Was receipt No. 21 made out while you were there ?
- A. It was not made out in my presence.
- Q. Where did you sit down for collection ?
- A. At Patel Ramji Lala's house.
- Q. Did people make payments there ?
- A. Several people came and paid there.
- Q. Were any payments made before those received at Ramji Lala's house ?
- A. In my presence only Daya Lala's, at his own place. (Receipt No. 22)
- Q. Was any other payment made at Daya Lala's house ?
- A. I do not remember.
- Q. Will you produce the record ?

Court to Thakor Ram : Do you object to these documents being shown ?

Govt. Pleader : Not the whole of it.

Court : Is it a record ?

Cong. Counsel : It is a record and there is nothing confidential about it. It is not a privileged document.

Court to Cong. Counsel : How do you claim to inspect this document ?

Cong. Counsel : It is a relevant document and I am entitled to produce it.

Government Pleader argued against the documents being produced.

- Q. Madhav Hira paid before you went ?
- A. The receipt was not made out in my presence.
- Q. Was the receipt of Daya Lala made out in your presence ?
- A. Yes.
- Q. He was the first man to pay ?
- A. Yes.
- Q. And his would be the first receipt ?
- A. In ordinary course his would be the first receipt.
- Q. If I now tell you that Daya Lala's receipt is No. 22 and Bai Kunvar's receipt is No. 21 do you still maintain your answer that Bai Kunvar did not pay in your presence ?
- A. She did pay in my presence.
- Q. Do you suggest that any receipt form was left deliberately blank before Daya Lala's was made out ?
- A. No.

AFTERNOON 3 P. M.

Q. Are you sure of the order in which the receipts are made out? And the three persons who you allege paid after you left come before the last one?

A. Yes.

Q. You told me that three receipts were made out in your presence?

A. Two or three.

Q. Do you suggest any sensible reason why any receipts should have been left blank and the next one made out?

A. No.

Q. I therefore put it to you that in the order in which these receipts stand your story is untrue?

A. It is true.

Q. Do you maintain the story that they paid after you left?

A. No.

Q. Do you admit now that this statement as regards Bai Kunvar paying after you left is false?

A. Yes.

Q. Let us take Dayal Dullabh. His receipt is No. 29 and the last receipt for that day is No. 32.

A. Yes.

The Congress Counsel read a portion of the Government's statement and asked witness if it was true.

Witness: Yes, it is true.

Q. Do you still maintain that though the receipt of Dayal Dullabh is numerically 29 he paid after you left? Or is that also untrue?

A. According to the order of the receipts he must have paid after I left.

Cong. Counsel: I still say that he did not do so.

Q. Now I take Govind Nata. His receipt is No. 31. According to the order of the receipt that payment must have been made by Moti before you left. The statement that Rs. 291-5-7 were paid while you were there and Rs. 173-9-0 were paid after you left, is it true or false?

A. The total is wrong.

Q. I take it that it is not true that Rs. 291-5-7 were paid while you were there?

A. It is not correct.

Q. What is the incorrectness?

A. I should add Rs. 43 more to the total Rs. 291-5-7.

Q. You are quite sure about that?

A. Yes.

Q. Rs. 334-5-7 were paid before you left. Is that correct?

A. Including the collection from Madhav Hira and Bai Kunvar which were paid before I reached the village.

Q. You are now positive I take it that Bai Kunvar paid before you reached?

A. When I went I was told that Madhav Hira had paid Rs. 40 out of the persons against whom notices were issued.

- Q. Before you left you knew that Kunvar had paid Rs. 43 before you came?
 A. If I mistake not I was told.
 Q. And still in the statement you gave the total as Rs. 291-5-7, exclusive of Bai Kunvar?
 A. (In Gujarati)
 Q. I will apply another test. You cannot arrive at Rs. 291-5-7, without including the last Rs. 5 of receipt No. 32?
 A. No.
 Q. And the Rs. 5 appertain to receipt No. 32.
 A. Yes.
 Q. And that is the last receipt?
 A. Yes.
 Q. I put to you that having regard to the numerical order of the receipts Govind Nata must have paid before Bikha Kalyan?
 A. My total cannot be made up before including Bikha Kalyan's Rs. 5.
 Q. You are quite sure that you were told while the total was being made up and before you left, that Bai Kunvar had paid. Do you wish to add any other explanation?
 A. I cannot say whether I was told before I left that Bai Kunvar had paid before I came.
 Q. Were you told at all that Kunvar had paid before you left? Shall I take it that you have no further explanation to give?
 A. I have no further explanation to give.
Govt. Pleader: (adds to the above) "for the present".
 Q. Then I am willing to give some time for it. I now put it to you that you gave the facts relating to the payments of these people in order to repel the charge of coercion. You invented the false story that they paid after you left?
 The Court intervening the question was re-put as follows :
 Q. I put it to you that the statement as regards these three people having paid after you left is false?
 A. It is not false. Regarding particular amount it is wrong with regard to Bai Kunvar. The Talati may have referred to the Rs. 40 paid a week after.
 Q. What about Dayal Dullabh and Govind Nata? Was there any mistake that they paid on any other day except on that day?
 A. They have not paid anything afterwards.
 Q. Therefore there can be no mistake about them on such a ground?
 A. No.
 Q. If you take Rs. 40 you cannot make Rs. 291-5-7. That is certain. Is it not?
 A. Yes.
 Q. Now about Daya Kala. You said you went to Daya Lala first?
 A. Yes.
 Q. You said you made an attachment?
 A. Yes.
 Q. You said that beyond the current dues he won't pay. Is that true?
 A. He said only the current dues were to be paid.

- Q. Do I understand you to say that he said that nothing was due before or something being due he would not pay ?
To the above question the witness could not give a definite answer.
- Q. Daya Kala said the same thing ?
- A. Yes.
- Q. Did you look at his khata at that time? You knew that he had a khata in Uttara and a khata in Rayam ?
- A. Yes.
- Q. Did you look at his khata that day ?
- A. No.
- Q. Are you aware that as a matter of fact he had paid not merely the current dues but his previous year's dues also in Uttara ?
- A. Yes.
- Q. And still you ask us to believe that he told you that he was not to pay anything beyond current dues ?
- A. Yes, I do maintain that.
- Q. How many people had paid the previous year's dues? How many defaulters were there in this village ?
- A. Most of the people were withholding payment.
- Q. I challenge you that a very large number of them had paid in full ?
- A. I do not know.
- Q. I take it that you did not care to have been informed even on the 17th of July ?
- A. No. That I did.
- Q. Then say it.
- A. I do not remember.
- Q. Will you tell me to-morrow ?
- A. Yes.
- Q. I like you to look at Panchnamas 1A and 1B.
- A. Both of them were made out in my presence.
- Q. Where were the articles ?
- A. The cupboards and boxes were lying on the road, some of the articles were on the ota.
- Q. 1A is whose ?
- A. Daya Lala's.
- Q. Where were the things ?
- A. The wooden articles were lying on the road and the other articles were put on the verandah, after they were attached.
- Q. In that list are there any articles exempt from attachment under the Land Revenue Code ?
- A. I did not find any articles. They were all surplus not required for daily use.
- Q. Did you find any beds there ?
- A. Yes.
- Q. You found some utensils ?
- A. Yes.

Q. There were four beds ?

A. Yes.

Q. There are six beddings ?

A. Yes.

Q. There is nothing in this Panchnama to show that there were any beds in the house for the members of the house ?

A. Nothing.

Q. You carried out this attachment in your presence ?

A. Yes.

Q. I take it that you knew that necessary bedding and beds were exempt from attachment ?

A. Yes.

Q. Do you say that any beds or beddings were left inside the house by you ?

A. Yes.

Q. How many were left ?

A. 2 beds and a few old godras (7 or 8).

Q. Did you inquire how many members of the family there were ?

A. I did not.

Q. You could not possibly have known how many things were required for the judgment debtor and his wife and children ?

A. That I did enquire.

Now take 1B.

Q. You simply dragged out everything maliciously to frighten him ?

A. No.

Q. Then you were not carrying a proper attachment under the Code ?

The Court intervened and said that the khatedar must make these allegations and he had not made them. The Congress counsel replied that he had made the statement all right.

The Court then objected to the use of the word malicious. The Congress counsel thereupon agreed to remove the word.

Q. Did you take out every single thing in the house ?

A. No.

Q. Are there any articles there which fall within the description of unattached articles ?

A. Yes, there are some.

Q. Did you leave any articles in his house ?

A. Yes, I left some.

Q. Did you ascertain how many members of the family there were ?

A. I asked the Patel whether what I left was sufficient.

Q. Have you got the estimated value of Daya Lala ?

A. Yes.

Q. How much is that ?

A. Rs. 101.

Q. You took Rs. 25 from him and released the goods ?

A. Yes.

- Q. What was the amount of his arrears that day ?
A. Rs. 123.
- Q. It is your case that this was a very contumacious man ?
A. Yes.
- Q. You did not proceed with the further steps in the attachment though the goods were worth Rs. 101 and his arrears were Rs. 123.
A. Subsequently, somewhere about the end of July, I had to withdraw all operations.
- Q. And that was in view of the order of the Government of Bombay which was communicated to you ?
A. No.
- Q. Who gave you the orders to withdraw ?
A. The Collector asked me to give up all further operations.
- Q. When was that ?
A. About the end of July.
- Q. Was it before the 24th or after ?
A. After the 24th.
- Q. Was it somewhere about the 29th or the 30th ?
A. Somewhere about the end of July.
- Q. Were those orders in writing ?
A. I can find out.
- Q. Can you point to any authority that having attached the goods you can take Rs. 25 and lease them ?
A. There is none.
- Q. You told us yesterday that you were prepared to release Daya Kala's goods for a payment of Rs. 50 or less ?
A. Yes, for a payment of Rs. 50.
- Q. Those goods are still in the Revenue custody ?
A. Yes.
- Q. You have done nothing to release them ?
A. No.
- Q. Is it true that some payment has been received in respect of this matter which appears in your record ?
A. I do not remember. I shall look into the record.
- Q. I put it to you that all that Daya Lala said was "I cannot pay" and he did not say "I would not pay."
A. I deny that. He said he would not pay.
- Q. What are his Gujarati words ?
A. (Replied in Gujarati).
- Q. Did you ask him if he had any money ?
A. I did not ask him.
- Q. Daya Lala did not pay there and then ? He paid afterwards ?
A. Yes.
- Q. He brought the money from somewhere else ? Is it not ?
A. No, he brought the money from his house.

- Q. Have you any personal knowledge where he brought the money from ?
- A. He went to his house and brought the money.
- Q. Did you see any other khatedar personally bringing any money from his house ?
- A. I saw Dullabh Morar.
- Q. You thought his capacity did not exceed Rs. 25 ?
- A. I did not decide the capacity.
- Q. Then why did you accept Rs. 25 ?
- A. I then believed him that he could not pay more than Rs. 25 there and then.
- Q. You heard the evidence of the khatedars as regards the allegation of borrowing ?
- A. Yes.
- Q. And there is not a word in your statement of Rayam saying that you personally knew that two of them had paid from their house ?
- A. No.
- Q. Where is Dullabh Morar's house ?
- A. Just by the side of the Patel's house.
- Q. When did Dullabh Morar appear ?
- A. After 4.
- Q. Would you be surprised to find that Dullabh Morar's receipt is 24th i.e., 4th in the list? I put it to you that your story about Dullabh Morar bringing the money out of his house is an invention ?
- A. No.
- Q. But you cannot reconcile it with the payment at 4 o'clock ?
- A. I cannot.
- Q. Was there any rain during that day at all ?
- A. No.
- Q. Not a drop ?
- A. It may be drizzling.
- Q. Were the streets clean, or muddy ?
- A. It was clean.
- Q. Were any precautionary measures taken with reference to Rayam under the Land Revenue Code since March ?
- A. No.
- Q. Prior to March ?
- A. Last year there were.
- Q. During the time when the people were in Hijrat was there a precautionary measure in respect of their crop ?
- A. For joari crop. There was a precautionary measure that no one should remove the crop without the permission of the Mamlatdar.
- Q. Was there any precautionary measure with reference to cotton ?
- A. Yes.
- Q. It is not true that without a certain pass no cotton could be taken out at all ?
- A. Yes.

- Q. Anybody doing so was arrested or the goods at least were taken away from him?
- A. The man would be stopped and the goods would be taken away from him.
- Q. The cotton crop remained unpicked for some time after it was ready for picking? When was the cotton ready for picking?
- A. Beginning of March.
- Q. If I put it to you that it was in the middle of February would you dare deny it?
- A. In some cases it would be so.
- Q. The migrated peasants returned on and after the 16th of March?
- A. 16th or thereabouts.
- Q. In some cases the cotton remained unpicked for a period of a month?
- A. I do not know.

Statement *Re.* Discovery of Documents in the Possession of Government

This enquiry has reached a very critical stage. The Congress and the khatedars have already led the bulk of their evidence as regards seven villages out of 11 which have been admitted as falling within the terms of the enquiry. The learned Enquiry Officer in delivering his judgment on the question of the exclusion of the disputed villages has stated as follows:

“ It is clear to my mind that the definition refers to organised expeditions of combined forces of revenue officers and police such as we have in the case of the ten villages already admitted to the Enquiry. In these cases the combined force came together and, so far as the arrival and purpose was concerned, was a unit. In all these cases the Revenue and Police Officers were responsible officials of standing.

In my opinion it is organised expeditions of this kind alone that the communique meant to include within the scope of the terms of reference.”

As regards the first five villages namely Rayam, Moti Farod, Timberwa, Pardi and Khoj the Government have filed their reply to the statement of claim made by the Congress and the khatedars and the first witness called on behalf of the Government, Mr. Krishnalal Lalloobhai, the Mamlatdar of Bardoli who was, on his own admission in charge of the operations complained of, is under cross-examination. In answer to several questions he said that he would be able to answer them with more accuracy and correctness by referring to documents which are in his possession, power and control. In an earlier statement made by me before this Court I have also referred to several documents in the nature of Government orders or notifications relevant to the issues in this case. The other Government officers including the Collector of the District will, in due course, appear as witnesses. During the course of their cross-examination a large number of documents will have to be referred to both on the issues raised in the case as well as on their credibility. I mention the last point particularly having regard to the evidence in the cross-examination of the witness Mr. Krishnalal Lalloobhai now under cross-examination. During the course of his cross-examination with a view to falsify the statement made on behalf of the Government as regards the village of Rayam it became necessary to refer to the revenue receipts issued on the day in question. These receipt books are kept in two counterfoils. The order of receipts as must have been now realised is one of the most important tests to find out the truth of the story as alleged by Government as contrasted with the story already deposed to by the khatedars. During the course of the examination of this witness though counterfoil receipt No. 21 was produced and marked as an exhibit the Government objected to the production of the counterfoils of the rest. With a view not to delay the Enquiry for the time being I have carried on the cross-examination with reference to the receipts which the khatedars produced. I would have been entitled to refuse to go on without the production of the counterfoils in the possession of the Government. It is not possible in all cases to find the documents, even those served upon the khatedars because such documents are not generally preserved by ignorant villagers. In many cases it is doubtful whether they were served on them at all. Their copies or counterparts or originals as the case may be must be in the possession of the Government as a part of their record. It is now suggested that the Government cannot be called upon either generally to produce documents relevant to this Enquiry or that none of their witnesses can be cross-examined to find out whether any relevant documents existed and if their existence

is admitted, their production and subsequent inspection cannot be claimed. This is a very vital matter for the just conduct of this Enquiry. In the statement dated 22nd October which I referred to I had referred to the Government Orders and Notification on the question relating to what has been shortly described as the issue relating to the standard. The Enquiry Officer in his letter of the 31st October in replying to my statement has been pleased to say as follows :

" Presumably before the Congress made these allegations they were in full possession of materials upon which they were based and it is for them to produce these materials and prove their case. I am unable to see why Government should be asked to produce evidence to prove it for them. The Revenue authorities in Surat are in a way accused parties in this enquiry and it is not necessary for them to prove any particular standard.

Of course if there is any definite order of Government which you desire to refer that is a different matter."

The question has now been raised not merely with reference to the above mentioned documents but generally during the course of this Enquiry. I maintain and respectfully submit that in this case every document relevant to the issues in the case which is in the possession of Government is liable to be ordered to be produced and inspected and made use of by us and any order to the contrary would seriously affect the justice and the progress of the Enquiry. The reasons for claiming such an order are set forth below. Before I go to the reasons however it may be useful to indicate the nature of the documents in the possession of the opponents (the Government in this case).

(a) Since the 5th of March and up to the day of the order of this Enquiry it cannot be denied that the Government of India and the Government of Bombay must have issued orders, directions or notifications for implementing the terms of the Agreement of the 5th March and in particular clauses 16B and 17B and the terms of this Agreement now known as the Gandhi-Irwin Pact and in particular with reference to revenue suspensions in Gujarat. The very terms of the Enquiry show that the standard alleged in this case originated from the Agreement of the 5th of March and was applied thereafter. Its origin therefore necessarily must be the Gandhi-Irwin Pact and all subsequent orders must necessarily be relevant to the understanding on which both parties have acted and therefore forms material evidence in this case. In fact when the terms of reference were framed the parties were the same as those who entered into the first Pact of the 5th of March, and therefore they must have had the common standard in their mind and it is an entire error to suggest that there was some imaginary standard set up by the Congress specially known to themselves. Such a thing is unthinkable in connection with such a solemn document.

(b) From time to time in connection with the working of the Pact local orders must have been issued as well as orders must have been issued under the Land Revenue Code. Most of those orders in so far as they are relevant to the issues in this case would necessarily be affected one way or the other by reason of the Pact because the Pact imposes certain restrictions as a result of the Agreement between the Government and the Congress on the extreme legal rights possessed by the Government in the matter of the enforcement of the payment of land revenue. It has been admitted by the witness (Mamlatdar) yesterday that ever since these raids orders have been

made suspending further operations. It is therefore perfectly obvious that orders must have been issued from time to time which must necessarily show the manner, the method and the extent to which land revenue collections have been made (shortly called 'standard') in the Bardoli Taluqa and the Valod Mahal. All such documents in so far as they are relevant in this case, it is claimed, should be ordered to be produced and inspected and the more so if their existence is admitted during the course of the cross-examination of any of the Government witnesses. It is further stated in the letter of the Enquiry Officer of October referring to me that I should prove the standard. The true meaning of that expression I now see has not been fully understood. When I said that I should prove the standard I used the expression "prove" in the legal sense of the term namely not only from my own materials but from all the materials which I can legitimately call upon my opponents to produce including the cross-examination of their witnesses.

(c) All documents which must have come into existence at or about the time when the raids took place. The nature of the documents can only be indicated generally because they are necessarily in the possession of the other side. The daily reports sent by the Mamlatdar either daily or at intervals, in connection with the collection of revenue between the 10th of July and the 16th of July.

(d) Any communications which will throw light on the organised arrangement between the revenue officials and the police for and in connection with these raids.

This is the general nature of the documents which are necessarily relevant and material to this case. It is submitted that there is entire misconception in the contention that when these documents are called for the Government is being asked to produce evidence to prove the case for the Congress. It is also a misconception to say, that it is "fishing" to call for such documents. The Government is asked to do nothing save and except to produce relevant documents and give explanation if any during the course of the cross-examination of their witnesses which is a legitimate right of the Congress and the complainants. Further by reason of the rules of procedure and evidence to which I shall hereafter refer the Congress and the complainants are entitled to prove their case through the cross-examination of the Government witnesses and by any statements which may be found in the relevant documents in the possession of the opponents. That is one of the fundamental rights in all proceedings of this nature. It is respectfully and emphatically denied that the revenue authorities are in any way accused parties in this Enquiry. That again, is another misconception of the nature of the Enquiry and is entirely contrary to the very terms of the appointment of the Enquiry Officer in the notification of the Government of Bombay. The Enquiry Officer has been appointed under two solemn documents. First the communique of the Government of India of the 28th August 1931 followed by the notification of the Government of Bombay stating that this Enquiry would be held under Sec. 197 of the Land Revenue Code. This is therefore a revenue Enquiry. It is held by the Privy Council in an important case reported in the case of Nilmoni V. Taranath, 9, Indian Appeals, 174, that revenue courts are civil courts and are governed by the Civil Procedure Code except in matters where a special procedure is enacted by the Local Act.

This is the pronouncement of the highest judicial tribunal of the British Empire save and except the House of Lords in so far as Great Britain is concerned and it would be flouting such an authority to talk in general words about the "revenue officers being accused persons", when the inquiry is in terms ordered to be held under Sec. 197 of the Land Revenue Code. At present

I am giving a quotation from Sir Dinshaw Mulla's recognised standard book on the Civil Procedure Code but if necessary the actual report of the decision will be produced on the reopening of the Court after the Deepavali holidays and further authorities if necessary will also be cited. Fortunately there is further statutory authority and Sec. 5 of the Civil Procedure Code runs as follows :

Sec. 5 sub-sec. 1

"Where any revenue courts are governed by the provisions of this Code in those matters of procedure upon which any special enactment applicable to them is silent, the Local Government may, by notification in the local official gazette declare that any portions of the provisions which are not expressly made applicable by this Code shall not apply to those Courts or shall only apply to them with such modifications as the Local Government may prescribe."

Sec. 141 Civil P. C. runs as follows :

"The procedure provided in this Code in regard to suits shall be followed, as far as can be applicable, in all proceedings in any Court of civil jurisdiction."

It is further necessary and useful to consider the provisions of Chapter 12 relating to revenue enquiries. Sec. 189 in terms refers to the Civil Procedure Code.

Sec. 192 also refers to Civil Procedure Code.

Sec. 194 though it does not in terms refer to the Civil Procedure Code reproduces a similar Section of the Civil Procedure Code.

Under Sec. 196 the inquiry shall be deemed to be a civil court for the purposes of liability to criminal proceedings of people giving evidence before the Enquiry Officer. It is to be noticed that the Government Officers have already given a list of their witnesses including those who are said to be accused persons. It is perfectly clear that if these proceedings savoured of what is alleged to be a criminal proceeding their appearance in the witness box has given the lie direct to any such contention. It is submitted that it is unnecessary to elaborate this matter any further for it is clear that this is a proceeding of a civil nature.

Once it is held that it is a proceeding of a civil nature as it is submitted it must be so held, the next question is the right of one or the two contending parties to claim production and inspection of relevant documents. That is provided by Order 11 of the Civil Procedure Code.

Under Rule 13, Sir Dinshaw Mulla has stated the result of case law on the subject both English and Indian.

"Every document which will throw any light on the case is a document relating to a matter in dispute in the suit though it may not be admissible in evidence. A document may not be admissible in evidence and yet it may contain information which may either directly or indirectly, enable the party seeking discovery either :

(1) to advance his own case

or (2) to damage his adversary's case or

which may fairly lead him to a train of inquiry which may have either of these two consequences."

It further appears from Sir Mulla's notes that where a document is or may be evidence for the adversary the party cannot withhold inspection of it from the adversary although his own evidence may be thus disclosed.

Mulla's C. P. Code, 9th Edition, Page 565.

The Court further is bound to order the production and inspection of these documents which fall within the description above given and they are not the less liable to be ordered to be produced because they are in the possession of the adversary.

It would be a gross error if it is argued that each side must prove its own case exclusively by their own oral and by their own documentary evidence and that they are not entitled to prove their case if they can by cross-examination of the opponents' witnesses or by the documents in the possession of the opponents relevant to the case. Such an argument contravenes the most elementary principles governing all judicial proceedings. This claim however is subject to any plea of privilege, which can be claimed under definite provision or rule of law and cannot be the mere *ipse dixit* of any individual and it is for the party claiming the privilege to show that any of the documents after describing them fall within the provisions relating to privilege which are to be found in the Indian Evidence Act. It is not for me to deal elaborately with those provisions. That is a matter which the party claiming the privilege may well be left to prove. The burden of proof has got nothing to do with this question now under discussion. The only meaning of the words "burden of proof" is that after all the relevant evidence is brought before the court it is for the party on whom the burden of proof lies to show that he has proved his case. The burden of proof does not mean which it is erroneously contended to mean that they are not entitled for proof of their case to rely on the cross-examination of the opponents or the statements contained in their documents. This is other misconception which it is necessary to clear with great deference. For these reasons it is submitted that the documents of the class above referred to should be held to be relevant and liable to be produced as and when they are called for and required and it is prayed that an order in that behalf may now be made.

Though I could have called for a regular affidavit of documents which the opponents are liable to be ordered to make I being willing and ready to submit to such an order, so far as we are concerned, the formality may be dispensed with and each side may be called upon to furnish a list of documents falling within the description mentioned in paragraph *a*, *b*, *c*, and *d* and such a list is always given at their peril because they are not allowed to withhold any document even though it may damage their contention. Before I conclude I ought to again emphasise the vital character of the present question, for any Enquiry which may be conducted without the production of relevant documents (except so far as privilege is claimed and allowed by a considered judgment of the Court on that particular document) would be bereft of any value in the judicial determination of the relevant facts in issue in this case.

Sd. BHULABHAI J. DESAI

Order

This order relates to a request by the learned Counsel for the Congress and the Khatadars that I should call upon Government to produce for inspection certain classes of documents relating to the inquiry, which are stated to be in their possession, the production of which is said to be essential to the proper determination of the issues in the inquiry. This request is based upon the submission that every document relative to the issues in the case which is in the possession of Government is liable to be ordered 'to be produced and inspected and made use of' by the opposite parties. In the written statement on this subject it is submitted that this liability arises under the provisions of the Civil Procedure Code which are claimed to be applicable to all the proceedings in this enquiry under Section 5 and (or) 141 of that Code.

2. The documents in question are stated to be of the following classes :

(a) All orders, directions and notifications of the Government of India or of the Government of Bombay issued for the purpose of implementing the terms of the Agreement of March 5th, 1931, and in particular clauses 16-B and 17-B, and also with reference to revenue suspensions in Gujarat which may have been issued between March 5th and the date of the order of the inquiry i. e. 26th September 1931 ;

(b) All local orders issued in connection with the working of the agreement of March 5th. (The description of the documents given in the written statement is exceedingly confused and it is impossible to make out what exactly is meant. Some sentences are unintelligible);

(c) All documents (relative to the inquiry) which must have come into existence at or about the time when the visits took place : It is stated that the nature of these documents can only be indicated generally because they are in the possession of the other side, but the periodical reports of the Mamlatdar in connection with the collection of revenue are referred to as an example ;

(d) Any communications which will throw light on the organised arrangement between the revenue officials and the Police for and in connection with these visits.

3. As regards classes (a) and (b) of these documents the following reasons have been given for asking for their production :

(a) The 'standard' alleged to exist in this inquiry is shown by the very terms of reference to have originated from the agreement of March 5th and it was this standard which was applied thereafter and therefore all subsequent orders relating thereto must necessarily be relevant to this inquiry, as the parties to the agreement and the inquiry were the same ;

(b) Allowing for the confusion referred to above, the reasons seem to be that the local orders referred to must have necessarily been based upon the agreement of March 5th because that agreement imposed certain restrictions upon the extreme legal rights possessed by Government in the enforcement of the payment of land revenue.

4. Finally it is required that these papers should be produced on affidavit, subject, as was submitted in the oral statement of the case, to the penalties for perjury if any papers were held back.

5. In dealing with this matter I will first take the question of my legal authority to act as required. In the written statement this is based upon the

provisions of sections 5 and 141 of the Civil Procedure Code and in the first part of the oral statement of the case this attitude was also taken by the learned counsel, the Land Revenue Code being mentioned only to deprecate its authority. In the reply to the Government Pleader, however, the Civil Procedure Code was hardly mentioned at all and all stress was laid on the authority conferred on me by Section 197, Land Revenue Code, read with Section 189 of that Code. It is probable that in the interval the learned Counsel had realised that his contention that the provisions of the Civil Procedure Code are applicable to this inquiry were erroneous, and if so I quite agree with him. Section 5 does not apply, if for no other reason than that I have no jurisdiction to entertain suits or other proceedings relating to the rent, revenue or profits of land used for agricultural purposes, but am simply a revenue Officer appointed under section 197 of the Land Revenue Code for a specific purpose, *viz.*, to make an inquiry and to submit a report. Neither does section 141 apply, because I am certainly not 'a court of civil jurisdiction' but merely a reporting officer as stated above. But in point of fact the very provisions of Chapter XII of the Land Revenue Code do not apply to proceedings under that chapter, for if they did, there would be no point in making certain provisions of that code specifically applicable in certain cases, *e. g.* under sections 189 and 192.

6. It is clear therefore that the only authority under which I could act would be according to the powers which I possess under the provisions of Chapter XII of the Land Revenue Code.

7. Under that Chapter I have the following powers :

(a) Under section 189, to summon any party whose attendance I consider necessary.....to produce documents for the purpose of any inquiry which I am legally empowered to make. Such summons may be for the production of certain specified documents or for the production of all documents of a certain description in the possession of the person summoned. Persons summoned are bound to attend and produce such documents.

(b) Under the general powers conferred by section 197 the inquiry is to be conducted, as no rules have been prescribed by Government, 'according to the discretion of the officer in such a way as may best seem calculated for the ascertainment of all the essential facts and the furtherance of the public good, and these directions would naturally control the use of the powers conferred under section 189.

8. It will be seen that no power is conferred under this chapter on private parties to call for the production of documents, but only to ask for the summoning of witnesses under section 192, though even this section does not apply to proceedings under section 197. Parties who require the production of documents have therefore to apply to the Enquiry Officer and he can use his discretion whether to order production or not. Of course private parties have all the rights of inspection, taking copies, etc., of the classes of documents specified in section 213, Land Revenue Code, and according to the rules under that section, but these rules do not apply to the present case which is concerned with the production of documents other than those falling under this section.

9. I have now to consider the position which I should take up regarding the request made in the written statement for the production of the classes of documents specified. What I am asked to do, presumably, is to issue summonses—in the case of the higher authorities presumably in the shape of 'letters of request'—to produce all documents of the kind specified which may be in their possession. The authorities to be addressed will be the Government of India, the Government

of Bombay, the Commissioner, N. D., the Collector of Surat and the District Superintendent of Police, Surat, the two latter of whom would have to issue instructions to their subordinates and be responsible for the production of all papers in their possession. Now it is clear that there are certain legal difficulties which would have to be considered regarding my power to issue summonses of this wide character to the authorities concerned and of course, as the Civil Procedure Code does not apply, there is no question of production under affidavit. But a consideration of this point may be postponed, as the first question to be decided is the extent to which it would seem to be necessary looking to the terms of reference, and to other general considerations, to call for the production of all or any of these classes of papers. In coming to a decision on this point I have been asked to take as a guide the general principles of law laid down by the Civil Procedure Code even though the Code itself may not be applicable, and there seems no objection to this being done, looking of course to the circumstances of the case and subject to a consideration of the terms of reference. I propose therefore to consider the questions raised from the standpoint of:

- (a) the relation of the documents to the case as put forward by the Congress;
- (b) the stage of the proceedings at which this request has been made;
- (c) the classes of documents dealt with.

To take these in order:

10. (a) *The relation of the documents to the Congress case.*

At the end of the written statement the learned counsel has hinted and during the course of his address openly stated that if the decision in this matter is not in his favour he would have to withdraw from further proceedings. It is clear therefore that in his opinion the Congress case cannot usefully be proceeded with on the basis of the evidence hitherto produced or now in his possession. This opinion is no matter for surprise when taking in conjunction with the somewhat extraordinary statement made during the course of his address on this subject that *the only witness whom the Congress had to put forward on the subject of the 'standard' was Mr. Gandhi himself*, and Mr. Gandhi is not of course available. It would therefore appear—and this I consider to be a matter of legitimate comment—that the inquiry was taken up by the Congress with the knowledge that their only witness on the point of the 'standard' which is the most important issue in the case would not be available; or, in other words, they took it up without any evidence in their favour at all. In view of this circumstance it is somewhat difficult to understand how the learned counsel came at the opening of this inquiry to make the definite statement that the standard which actually was in operation during the period in question, and which he could prove was in operation, was the 'no borrowing standard' when, as it now turns out, he had no evidence available on the spot at all.

What therefore is now being sought to be done is to obtain inspection of a mass of Government records with a view to discover the existence of any circumstances which will enable a case to be made out against Government on the basis of evidence produced by Government themselves. It is admitted by the learned Counsel that he does not know what these records contain and that it is a matter of luck whether they will tell for him or against him. In other words the whole thing is a gamble, or, in legal language, 'fishing' inquiry undertaken 'merely in the hope of discovering something which may help the party interrogating to make out some case' (*Mulla's C.P.C.*, p. 561). And I am asked to do this in face

of the admission of the learned Counsel that the Congress have no evidence of their own to give, except that of the absent Mr. Gandhi, as to what they mean by the 'standard' and no definition of the same. Incidentally I may quote a statement of the learned Counsel during the course of his address that his own idea of the standard was that even if a khatedar had the day before purchased land to the value of Rs. 1,000 for cash, yet Government could not on the next day recover any assessment from him if he had no actual cash in his house on that day, on which it is only necessary to remark that it would be in any case useless to search the Government records for evidence on such a basis as this.

In Civil Law the position would appear to be analogous to the case of a litigant who appears before a judge and states that though he has no evidence of his own he might possibly, though he is not at all sure, be able to produce some sort of evidence on his own behalf if he is permitted to go through all the books of his opponent—including his private correspondence. Comment seems unnecessary.

(b) *The stage of the proceedings at which the inquiry has arrived.*

In view of the fact, now admitted, that the Congress have no evidence of their own upon which to rely and must depend upon such as may be derived from the Government records it was certainly incumbent upon them to produce their demand at an early stage of the proceedings; at any rate, long before three-fifths of the evidence has been taken as is actually the case at present. But, though certain statistics were asked from the Collector—and I understand, refused—no demand whatever was made from the Enquiry Officer till October 22nd and then only in a restricted form referring to the orders of the two Governments only. The present comprehensive demand has been presented only after the inquiry has been in progress for a month, and is then presented suddenly coupled with an ultimatum that unless the decision is in favour of the Congress they will withdraw from the inquiry. In these circumstances it is difficult to avoid the conclusion that the decision to ask for the production of Government records was made at this late stage in order to fill up a large hiatus discovered in the evidence produced hitherto.

(c) *The classes of documents dealt with.*

The classes of documents asked for cover a wide range and are quite undefined and the Congress do not know whether such documents of the vague classes given exist or not. It is also obvious that a very large amount of time and correspondence would be taken up in preparing for the production of such documents. But further, most of these classes of documents have no connection with the terms of reference. The argument that *because* the date of March 5th is mentioned in the terms of reference and *because* the parties to the agreement of March 5th and to this inquiry were the same, *therefore* the mention of this date *must* mean that both the parties to the agreement *must* have had some common standard in their minds at that time and that this *must* be the standard to which a reference is made in the terms of reference and that therefore this *same* standard *must* be the same as that adopted in the Bardoli taluka, merely forms a series of complete nonsequiturs, based upon an original fallacy. In the terms of reference the date of March 5th is merely a point of time limiting the period within which the Enquiry Officer is to institute comparisons between the villages now in question and the rest of the Taluka. In point of fact it was a convenient date because it represents the end of the 'no tax' movement in Gujarat, and also it was in the middle of March that the 'Hijratists' in the Bardoli taluka returned to their villages and land revenue collections recommenced. But even these consi-

derations are not relevant under the terms of reference as they stand, under which the date of March 5th is merely a point of time and no more, and the attempt to build upon it the elaborate structure of argument raised by the learned Counsel is quite illegitimate. All that this inquiry is concerned with is an actual standard which, in view of their allegations, the Congress must at least show *prima facie* to have been in operation in the rest of the taluka and to have been exceeded in the case of the khatedars of the 10 villages in question. It certainly cannot concern itself with purely hypothetical standards which cannot be shewn to have ever been in operation and which are in themselves merely based upon theoretical and fallacious interpretations of the Delhi Pact.

11. It is hardly necessary to add that documents which came into existence after the date of the visits cannot possibly have any bearing on the question of what was the standard at the time of the visits, unless they contain any admission referring to that period. It is, however, for the Congress to show that documents of this kind *prima facie* exist before steps could be taken to ask for their production.

12. It is unnecessary to go into further details regarding these documents or to discuss this matter at greater length. If any reasonable requests for the production of documents which are really shewn to have a bearing on some definite case put forward by the Congress and having relation to the terms of reference are put forward I will do my best to accede to them but it is absolutely impossible to agree to the vague and unreasonable demands made in the reference now in question.

12th November, 1931.

Sd. R. G. GORDON,
Enquiry Officer,
Bardoli.

Reasons for Withdrawal

Having regard to the terms of the order of the Inquiry Officer, dated the 12th of November 1931, relating to my request for the production and inspection of documents in the possession, power and control of the Government, opponents in this case, I have come to the conclusion, with sincere regret, that the further continuance of the Congress and the khatedars and my colleague and myself in this inquiry is useless and it is due to myself and the Congress that I should summarise the situation and state my reasons for the decision to which I have come, which decision has been accepted by those who have instructed me in this inquiry.

The inquiry was ordered as a part of a comprehensive document which is an agreement following upon the Gandhi-Irwin Pact. The terms referring to the present inquiry and the communique are as follows :

"In regard to collections of land revenue in the Surat District the point in issue is whether in those villages of Bardoli Taluqa and Valod Mahal which were visited by revenue officials accompanied by a party of police during the month of July 1931, more severe demands having regard to their material circumstances were made from revenue payers and enforced by coercion exercised through the police than were made from and met by revenue payers of other villages of the Bardoli Taluqa. The Government of India, in consultation and full agreement with the Government of Bombay have decided that an inquiry shall be held into this issue in accordance with the following terms of reference.

TERMS OF REFERENCE

To inquire into the allegations that khatedars in the villages in question were compelled by means of coercion exercised through the police to pay revenue in excess of what would have been demanded if the standard had been applied which was adopted in other villages of the Bardoli Taluqa where collections were effected after March 5, 1931 without the assistance of the police and to ascertain what sum, if any, was so paid.

Within the terms of reference evidence may be produced on any matter in dispute.

The Government of Bombay have appointed Mr. R. G. Gordon, I.C.S., Collector, Nasik, to hold the inquiry."

As will be observed this is a document complete in itself and in order to render it so complete it is provided therein that within the terms of reference evidence may be produced on any matter in dispute by either side. The Government of Bombay appointed Mr. R. G. Gordon, I.C.S., Collector of Nasik to hold the inquiry. The holding of the inquiry and the terms thereof form part of the said agreement and no orders could be legitimately passed by the Government of Bombay or even the Government of India in any manner modifying the widest power that the inquiry officer would have on the terms of the inquiry agreed upon without the consent of the other party to the agreement. It is not pretended that while issuing the order ordering that the inquiry officer was to hold the inquiry under Section 197 of the Land Revenue Code, the Government of Bombay obtained the consent of the Congress or their representatives. It is therefore idle to take refuge behind that order in support of the resistance to the production and inspection of relevant documents. Under the terms of the original order every principle of natural justice conducive to the discovery of truth and the ascertainment of essential facts would and ought to have been enforced and merely

because some of the provisions of natural justice conducive towards that end are to be found embodied in the Civil Procedure Code, their application could not have been denied on the terms of the inquiry as agreed.

The inquiry commenced on the 5th of October and I have already called before the inquiry officer 63 khatedar claimants and 71 witnesses. I have already given particulars of the complaining khatedars of the remaining villages and of the witnesses with reference to the village of Vankaner. There remain to be examined 51 khatedars and 73 witnesses.

63 khatedar claimants and 71 witnesses have been examined and cross-examined and wherever it was possible they have produced documents which, having regard to the class from whom they are drawn and the circumstances under which the monies had to be borrowed, must necessarily be few in number. The volume of evidence already called and the remaining evidence which is ready render it impossible to fairly suggest that we embarked on this inquiry without realising the import thereof and what it lay upon us to prove.

In my opening address I made it clear that the evidence on the question of 'standard' was partly documentary and partly oral, that the documentary evidence commenced with the agreement of the 5th of March and must include all relevant documents upto the date of the agreement under which the inquiry was agreed to be held namely the 28th of August 1931. It was further pointed out that the origin of the standard was the calling off of the no-tax campaign and the consequent reciprocal promise on the part of the Government to apply a standard for the collection of land revenue, in derogation of their extreme legal right and the most important measure of the standard is stated in the very terms of the inquiry namely the material circumstances of the khatedars concerned. It will be therefore erroneous to suggest that the documents now formally called for were not present to our minds as a necessary part of the evidence in this inquiry even though the same must necessarily be in the possession, power and control of the Government, *i. e.* the opponents in this case. One of the measures of the Civil Disobedience movement was the non-payment of the land revenue and the same was carried out as an organised measure in the Talukas of Borsad and Bardoli and Valod Mahal (barring a few isolated areas which it is immaterial to enumerate for the present purpose). The agreement of the 5th of March between the Government and the Congress therefore necessarily appertains to the area of that no-tax campaign as a whole. The correspondence which took place after the 5th of March between Mahatma Gandhi representing the Congress on the one hand and Mr. Perry and Mr. Bhadrapur, Collectors of Kaira and Mr. Kothawala, Collector of Surat on the other, necessarily relate to the working of the agreement of the 5th of March. Such correspondence related *inter alia* to the method and extent of the collection of land revenue from the khatedars in the areas affected by that campaign and was relevant evidence in the case on the question of standard. During the course of that correspondence it was made perfectly clear that the standard agreed to be adopted was what has been shortly described as the 'no-borrowing standard'. In the letter dated 3rd May 1931 to Mr. Perry, Mahatma Gandhi wrote as follows :

* * * * *

"It is common cause between us that the people should pay revenue to the utmost of their capacity. I know that in defining the word 'capacity' there may be difference or there is a difference as I now see from your letter. During our talk I thought that you agreed that no one need borrow money in order to pay the revenue dues. I am carrying out that healthy formula. I know that it has not

been carried out before and may not be carried out in future. In any case, for this exceptional year I think that there is no way out of it as I hope to show conclusively in due course. This of course does not mean that those who wish to pay by borrowing should be prevented by me from doing so. Only I could not take it upon me to press them to do so."

In his letter to Mahatma Gandhi, dated the 3rd May, 1931, Mr. Perry replied as follows :

** * * * *

I agree with you about borrowing on interest. We do not exclude, I think, arrangements amongst friends or the like."

Mr. Kothawala's letters stating that no khatedar would be obliged to pay unless he could pay, though not so explicit must on a reasonable construction mean substantially the same thing.

It was further submitted that the Agreement of the 28th of August and the terms of the appointment of the Enquiry Officer contain within it if and when properly understood sufficient evidence of the standard above referred to, in a different language namely the then material circumstances of the Khatedars concerned. It was next pointed out that the Government must be in possession of documents bearing on this issue now detailed under the different heads in the request for production and inspection. In my letter of the 22nd of October I referred to the orders and instructions of the Government of India and the Government of Bombay in relation to clauses 16B and 17B of the Gandhi-Irwin Pact and that such documents must necessarily bear on the interpretation of the Gandhi-Irwin Pact and the standard referred to in the terms of the inquiry. It was further stated that the substance of such orders and instructions without describing them with reference to the nature of the documents or their date must necessarily have been communicated by the representatives of Government to the representatives of the Congress from time to time. It was also stated that Mahatma Gandhi could personally give evidence on this question by reason of the communications that he had both oral and written with the representatives of Government and in particular the Collectors concerned. It was never apprehended or believed that the Government opponents in this case, would or could be treated in any manner different from an ordinary opponent in a civil matter as regards their obligation in the matter of production and inspection of relevant documents. In addition to all this I had taken precaution to obtain a personal statement from Mahatma Gandhi on the meaning of the term 'standard' contained in the order for inquiry as soon as it was possible so to do and that statement is quoted in extenso in my opening address. Mahatma Gandhi instructed me to say that the standard was as follows :

"With reference to revenue collections in Bardoli and Borsad it was from the very beginning a clear understanding that the khatedars affected by the Civil Disobedience were to pay only as much as they could without borrowing So far as the terms of reference to the inquiry officer are concerned I have distinctly understood that the standard referred to therein means "ability to pay without borrowing."

Without admitting that the standard issue is any more important than the police coercion issue in this case it is injustice to us to say that we started without any available evidence on the question of standard.

Every litigant, it is submitted, is entitled to prove his case not only by the materials oral and documentary in his own possession but is equally entitled to

prove his case by the documentary evidence in the possession of his opponent relevant to the issues as well as by the cross-examination of the opponent's witnesses. It is to me a novel proposition that any judicial mind can reach the stage of talking proof or no-proof until the whole of the evidence on both sides has been recorded. It has further been repeatedly stated that Mahatma Gandhi would be called as a witness as soon as he was available. The Enquiry Officer must be fully aware of the importance and the reasons leading to his absence from India, and it was anticipated that if the inquiry had taken its normal course after a production and inspection of documents he would have been available as a witness before the completion thereof although if proper discovery had been given his evidence in all probability it may have not been necessary at all after the documents had been tendered and the Government witnesses including the Collector had been cross-examined.

It is therefore respectfully submitted that it was an error as is supposed in the order that we started with no available evidence on the question of "standard". It ought to have been on the other hand clear that we had a considerable body of evidence above referred to. But irrespective of the error of this supposition it is still more erroneous to say that there can be any justice or equity in the Government not producing or not being ordered to produce all the relevant documents in their possession in an inquiry of this nature after having agreed to the inquiry and their obligation is not in the least degree affected by the nature and volume of the evidence in the possession of their opponents.

Before the order was actually pronounced I thought it my duty to call attention to the case of *Robinson v. State of South Australia* reported in 1931 A. C. P. 704 on the position of the Crown and their obligation as regards the production and inspection of documents in a case in which the Crown is a party to a cause. The case has the most direct bearing on the present inquiry in that in the Australian case the claimants were basing a claim on a charge of negligence on the part of the Crown and its officers. It was admitted by the claimants who were numerous that without the production of the documents by the Crown they could not prove their case and some of the claimants actually abandoned litigation because of the attitude of the Crown in refusing to produce the relevant documents. One of the more undaunted ones however carried the matter to the Privy Council, who upheld the right of every litigant to get the opponent to produce relevant documents even though the opponent was the Crown subject to any question of privilege and apart from the question of privilege the duty and obligation of the Crown is stated by Lord Blanesburgh in the following terms:

"Particularly must it be remembered in this connection that the fact that production of the documents might in the particular litigation prejudice the Crown's own case or assist that of the other side is no such "plain overruling principle of public interest" as to justify any claim or privilege. The zealous champion of Crown rights may frequently be tempted to take the opposite view particularly in cases where the claim against the Crown seems to him to be harsh or unfair. But such an opposite view is without justification. In truth the fact that the documents if produced might have any such effect upon the fortunes of litigation is of itself a compelling reason for their production—not only to be overborne by the gravest considerations of state policy or security. As was pointed out by Lord Buckmaster in delivering the judgment of this Board in *Esquimalt and Nanaimo Ry. Co. v. Wilson* (1920) A. C. 358, 366, Baron Atkyns often cited observations in *Pawlett v. Attorney General* (1667) Hardres 465, 469, are based upon general principles: "The party ought in this case" said Baron Atkyns there, "to be relieved against the King because the king is the

fountain and the head of justice and equity and it shall not be presumed that he will be defective in either, and it would derogate from the King's honour to imagine that what is equity against a common person should not be equity against him."

That is the standard of equity and honour on which I relied when I entertained the belief that when the proper time came every document material to the issues in this case will be produced by the Government without any objection and without any hesitation and even without resorting to an argument as to the rights and powers of the Inquiry Officer to order such production. The Government however has, in this case, chosen to take another course. The Inquiry Officer has upheld their resistance. Comment is superfluous.

As regards the description of the documents which are called for I may again refer to the same judgment at page 719 where six out of the 16 sets of documents are described in the following terms :

"Six of the sixteen sets of documents so particularised are the following :
 " (1) Reports of inspectors employed by the defendant relating to the wheat of the 1916-17 harvest. (2) Correspondence between the defendant, including the Wheat Scheme and Wheat Harvest Board and such inspectors in respect of the said wheat. (7) Minutes of the Wheat Advisory Committee (12) Correspondence between the Manager of the Wheat Scheme and W. W. Hutton. (13) Letters from Clarence Goode, then Minister of Agriculture to Messrs. F. A. Verco, E. A. Badcock, W. M. Alford, C. J. Smith and G. G. Nicholls, written in or about June 1917. (15) Letters from one David Kelly to the manager of the Wheat Harvest Board written in or about the month of February 1917."

When an opponent describes documents in the possession of the other side of which he claims production and inspection he necessarily describes them with reference to the issues in question and it is an error to say that such description is 'fishing'.

If one applies his mind to the matter it would be easily realised that there cannot be any other way of describing relevant documents exclusively in the possession of the opponents unless indeed one were to resort to an unworthy method of stealing its contents or getting its particulars and the reason why the opponent's conscience is sought to be affected in cases of this character is that the relevant documents must be exclusively within his own knowledge.

It is also erroneous to suppose as would appear from the order that the argument that the application for production and inspection of documents in the possession of Government was justified by C. P. C. was abandoned by me in reply.

It is submitted that the proper time to demand these documents had arrived when the first Government witness was under cross-examination and it was believed that no material documents could ever be withheld as a matter of law or as a matter of honour unless the purpose of the inquiry was to conceal the truth and not discover it. That the first Government witness was cross-examined after about a month from the opening of the inquiry was no fault of the Congress or the Khatedars. It was ordered from the very commencement that on the conclusion of the evidence of the Khatedars as to each village the witness for the Government would be examined. The Government was allowed to take an extraordinary position in this case of filing their reply after the evidence of all the Khatedars and their witnesses for five villages had been fully recorded. If

the original order had been adhered to the Mamlatdar would have been cross-examined in the second week of the inquiry and necessarily the present question would have been brought to a head at the time. The resistance to the production and inspection of relevant material documents in the possession of the Government cannot therefore be justified on the ground that the application has been made after some time and it is respectfully submitted that the only reasonable inference for resistance to production and inspection is that the documents if produced would clearly damage the Government's case as it has been proved to be the fact in case of their written statement as regards the village of Rayam. I do not wish to further comment on the fate of the written statement as disclosed by the cross-examination of the Mamlatdar.

In this connection I must further deny the correctness of the statement that there was any admission on my part that the Congress had no evidence of their own to give as to what they meant by the word 'standard' except the evidence of Mr. Gandhi nor had they any definition thereof. As regards the statement attributed to me that I do not know what the Government records contain, it is a truism but has never been held to be a reason for declining to order production of documents if they are relevant. I must further add that in this case those who instruct me are not totally ignorant of what the records probably contain. Ignorance or knowledge is immaterial on the right to get production and inspection of relevant documents in the possession, power or control of the opponents. The existence of the relevant documents is not denied, and in fact except arguing that the inquiry officer was not a civil court no valid reason was given on behalf of the Government why the documents should not be ordered to be produced.

It is stated in paragraph 4 of the order as follows :

"Finally it is required that these papers should be produced on affidavit, subject, as was submitted in the oral statement of the case, to the penalties for perjury if any papers were held back."

The statement of the requirement is mentioned as if to suggest that the requirement was extraordinary. Every litigant has to do it and no honest litigant should be afraid of doing it. However as a matter of fact it was made clear in the statement for request of these papers that we would be content if a list was supplied of relevant papers and documents after due inquiry and that we were prepared to trust the correctness of the list instead of requiring an affidavit.

Before I quit this matter I must say that the remarks as regards item (b) of the documents might easily have been spared. There was an obvious clerical error which in the context must be understood by any man conversant with the controversy. I further respectfully protest against the expression of opinion on the question of what is the meaning of the term 'standard' and how it is to be proved or applied in a judgment in an interlocutory matter of this kind. It would almost appear as if the inquiry officer has anticipated a great deal of his final judgment on the question of standard on which point at the suggestion of the inquiry officer and by common consent the bulk of the evidence was held over. It is an elementary rule in case of judgments on interlocutory applications for judges to reserve their opinion on matters of this nature. The inquiry officer further observes as follows in the said order :

"Incidentally I may quote a statement of the learned counsel during the course of his address that his own idea of the standard was that even if a Khatedar had the day before purchased land to the value of Rs. 1,000 for cash, yet Government could not on the next day recover any assessment from him if he had no actual cash in his house on that day; on which it is only necessary to remark

that it would be in any case useless to search the Government records for evidence on such a basis as this."

I have had a considerable amount of free and frank discussion on the question of 'standard' from the commencement of this inquiry subject however to the understanding that no conclusion would be arrived at until after the whole of the evidence had been recorded before the conclusion. The officer had evidently some illustrations in his mind to which it might be difficult to apply the standard. One of such illustrations has been referred to in the judgment. If my recollection serves me right the case put to me was one of sale of land and not of purchase and that of the sale proceeds being applied in payment of the antecedent debts of the Khatedar. When the hypothetical case was put to me I answered saying that the case could be dealt with if the facts mentioned in the illustration were proved in any particular case and that in such a case the inquiry officer may well be right in coming to the conclusion that it was not a case of recovery in excess of the standard. Even on the assumption quoted in the judgment that the case was put to me the only answer that I can give is that it would be for the inquiry officer to hold that that case was also not a case of recovery in excess of the standard. The order however reads as if the extreme hypothetical case is illustrative of the actual cases of the Khatedar claimants but it must have been clear to the inquiry officer by now that such an inference cannot be justified on the evidence of the 63 Khatedars who have been called and I am in a position to state that there is hardly any among the remaining 51 Khatedars whose case can fall within that extreme hypothetical case. It is regretted however that this part of the order is built upon a generalisation of an extremely hypothetical case the like of which has not yet been deposed to and was not likely to be deposed to had this inquiry been continued. It is further observed in the order as follows:

"In these circumstances it is difficult to avoid the conclusion that the decision to ask for the production of Government records was made at this late stage in order to fill up a large hiatus discovered in the evidence produced hitherto."

I again wish to express my regret that the inquiry officer has chosen to form his judgment on one of the points involved in this case somewhat prematurely.

It is difficult to understand what is meant by the clause "a large hiatus discovered in the evidence produced hitherto".

The evidence on the question of standard has been reserved till a later time. There can therefore be no question of discovering any hiatus on the evidence under that issue. As regards the revenue *cum* police operations there is no hiatus large or small which can be said to have been discovered. Supposing there was, there is no reason founded in law why the documents in the possession of the Government that is to say either its Revenue or its Police Department should not be ordered to be produced if and so far as they are relevant to either issue. The statements in the diaries of the Officers concerned or in their reports or in the request for the employment of the police or in the records relating to the selection of villages for the application of coercive measures are all admissible evidence and the Congress and the khatedars are entitled to use the same either to corroborate their own testimony or even to fill the hiatus assuming it was found to exist. Every effort was made to express in concrete and clear terms the position of the Congress and the khatedars on the question of standard and how it resulted from the Delhi Pact. The Enquiry Officer purports to reject the same by calling it a theoretical and fallacious interpretation of the Delhi Pact and at the same time he makes an order which effectually prevents the production of documents which

must necessarily have relation to the true meaning of the term 'standard' as understood by the parties who drew up the terms of reference. It would be hardly justifiable to suppose that the term 'standard' had not a common meaning as understood by the parties who used it. The meaning therefore is as much known to the Government as to the Congress.

In the concluding part of the order the inquiry officer remarks as follows :

"If any reasonable request for the production of documents which are really shown to have a bearing on some definite case put forward by the Congress and having relation to the terms of reference are put forward I will do my best to accede to them, but it is absolutely impossible to agree to the vague and unreasonable demands made in the reference now in question."

In my letter of the 22nd of October I referred to the orders and instructions of the Government of India and the Government of Bombay on the question of standard. It is difficult to understand how a Government officer looking at the orders is unable to know which of them referred to the provisions of the Delhi Pact like 16-B or 17-B. It was not too much to expect that in the case of an enquiry or a controversy like this every officer whose duty it would be to prepare a list of documents relevant to the issues in the case would apply his mind to find out every material document. That is expected of every litigant or his legal advisor in every judicial tribunal in the civilised world. A request even for the production of counterpart receipts of land revenue payments was refused. A request for the production of the Mamlatdar's diary was evaded for three days and has now been eventually refused. A request for the production of daily collection reports between the specified dates of the 10th and 17th of July remained unheeded and has now been refused. Even the alleged report of the Talati regarding service of notices in Rayam was promised but not produced. In the face of what has occurred and having regard to the terms of the order it is difficult to find out what sort of a request would have been regarded as reasonable and not vague and would have been granted.

The Government having admitted that these eleven villages fell within the terms of the Enquiry, they necessarily admitted their description as given by the Enquiry Officer in his order dated 3rd November 1931 namely that these eleven villages were visited by organised expeditions of combined forces of revenue officers and police and so far as their arrival and their purpose was concerned it was a unit. In the events that have occurred this is neither the place nor the time to sum up the effect of the evidence of the khatedars and their witnesses and the conclusion to be drawn from its volume and clarity as contrasted with the evidence of the Mamlatdar of Bardoli, the only Government witness who has been only partially cross-examined for want of documents. The question of the production and inspection of documents is not merely a formal or a technical matter though it has been dealt with in that way in the order upholding the resistance to their production and inspection. It goes to the very root of a genuine desire to have an inquiry resulting in the ascertainment of truth. It is a clear indication to me as to the spirit in which the opponents intend to co-operate in an enquiry intended for the ascertainment of "essential facts" and also an indication as to their desire to act "for public good" and having regard to that spirit I am the more fortified in the conclusion to which I have regretfully come.

Sd. BHULABHAI J. DESAI,
Counsel for the Indian National Congress and
the Khatedars of several villages concerned,

13th November 1931.

Sardar's Manifesto to Farmers

To the Khatedars of Bardoli Enquiry villages,

It is with sincere regret that I, in consultation with Mr. Bhulabhai Desai, have to-day withdrawn from the Enquiry which we secured in your interest in agreement with the Government of India. The Khatedars and the witnesses have made considerable sacrifice and shown their wonted courage in the evidence which they gave.

"I am conscious of the grave difficulties under which you bravely came forward to state truthfully the real grounds of your complaint. You have also read the published evidence from day to day and I am glad to know the interest with which you have followed it.

"The Mamlatdar, the first Government witness, was under cross-examination of our Counsel for two days. You have had before you a verbatim report of the questions and the answers and you have seen how the Government case on the first village as well as generally began to crumble.

"During the course of that cross-examination, our Counsel applied for the production and inspection of all Government documents relating to the issues in the case because objection was taken during the cross-examination to the production and inspection of even counterfoils of revenue receipts or of which counterparts were issued to the Khatedars.

"The application was resisted on behalf of the Government on purely technical grounds and that resistance has been upheld by the Enquiry Officer. This shows that the Government is fully conscious that our case would be amply borne out if the relevant documents were allowed to be produced.

"In so far as you are concerned, the purpose of the inquiry has been amply fulfilled. In so far as the Government is concerned they stand self-condemned by resistance of the application.

"Our friend Bhulabhai has been with us for over a month at great personal sacrifice and leaving aside certain matters of National importance I have remained here throughout to assist and watch the progress of the Enquiry as the honour of the Congress was involved in it.

"The trend of the Enquiry has appeared to me to be hostile and one-sided but I was prepared to go on to the end until our Counsel was satisfied that further prosecution of the Enquiry was futile.

"One salutary check on the cross-examination of the Government witnesses having been withdrawn as the result of the order refusing the production and inspection of documents in the possession of the Government, it was realised that such mutilated Enquiry was worse than useless.

"Hence, in agreement with Bhulabhai, I decided and have now withdrawn from the Enquiry.

"Hereafter there is no need to take notice of any communication from the Enquiry Officer or any other Government officer in connection with this Enquiry. I have cabled our decision and withdrawal to Mahatma Gandhi."

VALLABHBHAI J. PATEL

Cable to Gandhiji

13th November 1931.

Mahatma Gandhi,

88, Knights Bridge, LONDON

"Examined 62 Khatedars and 71 witnesses belonging to seven out of eleven villages allowed. Five villages disallowed as not falling within terms of reference. After important admissions in part cross-examination of the Mamlatdar, first Government witness, Inquiry Officer held we were not entitled to production and inspection of Government documents of any kind relating to the issues in the inquiry. Trend of inquiry distinctly hostile and one-sided. In agreement with Bhulabhai withdrew from inquiry to-day". Vallabbbhai.

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THE DISSENTING MINUTE.

This Committee has been appointed by the Government of India in accordance with the recommendation of the Defence Sub-Committee of the Round Table Conference to work out the details of the establishment of an Indian Military College in order to train candidates for commissions in all arms of the Indian defence services. In order to understand clearly what exactly was meant to be included under the term 'details', it is necessary to refer to the proceedings of Sub-Committee No. VII (Defence) of the Round Table Conference and to the resolutions which were passed by the Sub-Committee and accepted by the Committee of the whole Conference. During the discussions of the Sub-Committee it was strongly urged by several members that, subject to the requirements of efficiency and the availability of suitable candidates for recruitment as officers, some definite indication should be given as to the rate of Indianisation of the officers of the Indian army, or some period fixed within which the Indianisation should be completed. It is stated in the report of the proceedings that the majority of the members of the Sub-Committee considered it impossible, for practical reasons, to lay down any definite rate of Indianisation.

**The Committee's
task as indicated by
the Round Table
Conference.**

Mr. J. H. Thomas, the chairman of the Committee, deprecated any precise specification of the rate or period. His remarks upon the subject are of importance. After stating that an expert committee should be set up to give immediate effect to the object of Indianisation, the chairman remarked that the first thing to do was "to secure the site of the building, the number of men you are prepared to train, the accommodation and all those things. The period is all dependent upon that" (p. 41 of the Report). Lord Reading observed that the expert committee to be appointed should have before them the reports of the committees appointed during his Viceroyalty in India (the Military Requirements Committee of 1921 and the Shea Committee of 1922 on the Indianisation of the Indian army) and that they should consider those reports. This suggestion was accepted by the chairman, who undertook that, when, in pursuance of the resolutions of the Sub-Committee, expert committees were appointed, those committees would, as a matter of course, take into consideration the proceedings of previous committees and in particular, the proceedings of the Military Requirements Committee of 1921 and the Committee of 1922 on the Indianisation of the Indian Army (*vide* p. 86 of the Report). There were two expert committees referred to in this undertaking and in Resolutions II (c) and III. It is obvious that the expert committee which was to be appointed to investigate the reduction of the number of British troops in India to the lowest possible figure was not primarily, if at all, concerned with the subject of Indianisation of the officers of the Indian units. Resolution II (a) recommended that immediate steps be taken to increase sub-

stantially the rate of Indianisation in the Indian army to make it commensurate with the main object in view; *viz.*, the increase of the responsibility of the people of India for the defence of their country. Resolution II (b) recommended the establishment of a training college at the earliest possible moment to give effect to Resolution II (a). If any committee has to consider the reports of the previous committees on the subject of Indianisation of officers in the Indian units, it is the present committee rather than the committee for the reduction of the British troops. It is a legitimate inference from the proceedings and resolutions of the Defence Sub-Committee that notwithstanding the use of the word 'details' in Resolution II (c), the principles as to the pace and method of Indianisation were not intended to be excluded from the purview of this committee. Otherwise what purpose is served by placing the reports of the committees of 1921 and 1922 before this committee? And how could the expert committee determine the number of men "you are prepared to train"?

The order of the Government of India appointing the committee as published in the Gazette of India follows the language of Resolution 4 (II) (c) of the Sub-Committee (Defence) of the Round Table Conference. But in his circular to the members of the committee, His Excellency the Commander-in-Chief stated that the committee would be concerned with all the *technical* details of the military, financial and educational problems involved in establishing an Indian military college. It was also stated that the Government of India further proposed to invite the committee to give their

The Committee's task restricted by the C-in-C in his circular letter and by his interpretation.

advice regarding the scales of pay of officers who enter the Indian army through the college, though this was not, strictly speaking, one of the problems involved in establishing the college. As regards the size of the college, it was stated that the Government of India would be in a position to indicate the annual output that would be required from the college, in order to meet the increase of Indianisation contemplated by themselves and His Majesty's Government and that the committee would probably be asked to prepare a scheme for a college of 200 to 250 students with an annual output of about 60 to 80, including a proportion of cadets for Indian State Forces. It must be first pointed out that the Commander-in-Chief was not warranted in restricting the scope of the committee's work by introducing the word 'technical' to qualify details. Is this restrictive interpretation of the scope of the reference justified? One of the questions mentioned by Mr. J. H. Thomas as requiring preliminary investigation is "the number of men you are prepared to train." This was obviously contemplated by him as a question for the expert committee. The determination of the number of cadets to be trained depends on a number of inter-dependent factors, (a) the number of suitable candidates likely to be forthcoming, (b) the strength of the staff and the equipment of the college, (c) the number of cadets who can be efficiently trained by the staff and (d) the number of cadets who can be absorbed into the cadre of officers, the maximum limit being set by the annual number of vacancies. Is the last factor a question of detail or of principle or of both? Even if it is a question of principle is it necessarily outside the purview of this committee or is it a matter on which the opinion of the

committee has to be taken ? In opening the proceedings of the committee His Excellency the Commander-in-Chief made an important exposition of the policy of Indianisation which he had proposed to the Government of India. He asked the committee to concentrate their attention particularly on the question of a steady supply of suitable candidates for the college. This announcement of policy contained several important features, the nature of which was for the first time clearly explained to the committee. It was ruled by His Excellency that the question of what should be regarded as a substantial increase in the rate of Indianisation commensurate with the main object of Resolution No. I of the Round Table Conference was not within the competence of the committee. In excluding this important question from the consideration of the committee and treating it as a matter for the decision of the Government without any advice or assistance from the committee, the scope of the committee's task as indicated by the Round Table Conference has been unduly narrowed. The work of the committee has been practically restricted to a consideration of the educational and financial details relating to the establishment of the college and its opinion has not been required on any of the important military problems connected with the establishment of the college. The correctness of His Excellency's ruling with regard to the scope of the committee's work is at best seriously open to question.

But apart from any question of the correctness of the ruling, the decision arrived at on the principles underlying the policy of Indianisation is very unfortunate. Questions regarding the pace and method of Indianisation

Vital issues as to pace and method of Indianisation.

have a most important bearing upon the capacity of the college and upon the speedy development of the defensive capacity of India. They are questions upon which there is a fundamental difference between the military authorities and Indian public. The attitude of the military authorities is in favour of a very slow policy of progress. On the other hand, Indian opinion favours a bold and liberal advance with a view to the speedy attainment of responsibility for defence, with all due regard to the conditions of efficiency and safety.

Let us first refer to the arguments which have been advanced by the military authorities in support of a slow policy of Indianisation:—

Arguments in support of slow policy.

(1) While there is plenty of fine fighting material, it has not been proved that Indians possess any capacity for military leadership.

(2) There is a sharp contrast in India between the martial classes and the non-martial classes, the former being deficient in intellectual endowment and the latter in martial spirit. It has yet to be proved that there are classes possessed of martial spirit and intellectual capacity combined.

(3) It is uncertain whether there will be a steady supply of suitable candidates for training for King's commissions.

(4) Whether Indian officers of non-martial classes can command the confidence of the martial classes has yet to be proved.

In the face of so many indeterminate factors any experiment by way of Indianisation of the officer ranks is

held to be a leap into the unknown and must therefore proceed very cautiously, until it is proved that Indian officers can face their responsibility.

The degree of proof required to convince the military authorities as to the efficiency and fitness of Indian officers for command has been stated differently at different times. The Sub-Committee of the Skeen Committee were informed by the India Office that it was desired to test the worth of the Indian King's commissioned officer in a time of crisis. In the report of the Simon Commission it is stated, presumably on the authority of some official memorandum that the Indian King's commissioned officer must stand the only test which can possibly determine his efficiency and must qualify himself by a successful army career for high command. These statements imply that no test short of actual experience under war-conditions could be accepted. On the other hand, it was stated by the present Commander-in-Chief that after a period of 14 years' service, it might be possible to judge of the fitness of the Indian King's commissioned officer for command and that it might be possible to ascertain whether the Indian officer can train his unit in peace and lead it in war. Any experiment on a large scale without waiting for the lessons of experience must, it is alleged, be attended with serious risks to the safety of India arising from external danger or internal disturbances. The validity of these arguments will be examined later on. They are considered by Indians to be more specious than sound, but they appeal to the average British layman. The British mind is essentially empirical and wishes to build upon the results of expe-

rience and is content to solve the problems of the day without looking forward beyond to-morrow. 'Sufficient unto the day is the evil thereof' is a maxim which more or less accurately expresses the mentality of the average Englishman.

Before examining in detail the reasons urged in favour of a dilatory policy, it is necessary to point out that they are all based upon a postulate which no Indian will be prepared to grant. The assumption is that so long as the capacity of the Indian for leadership is not proved to the satisfaction of the military authorities, the organisation of the army cannot be changed in character, that British officers must continue to remain in position of command and that the responsibility for the military administration cannot be transferred to Indian hands. There is even the further implication that the defence of India may conceivably have to remain for all time in British hands. Indians are quite alive to the necessity for maintaining the efficiency of the army and to the importance of not imperilling the safety of India. They are however naturally anxious to assume responsibility for the control of the army within a reasonable period. What then is a reasonable period for the Indianisation of the officers' ranks? It has been pointed out that even if British recruitment to the officers' ranks were stopped to-day, it would take 35 years for the army to be completely Indianised. The Shea Committee of 1922 which was appointed by Lord Rawlinson first recommended a period of 42 years but on further consideration submitted the shorter period of 30 years which was unanimously accepted by the Government of India as then constituted including

Lord Rawlinson. The refusal of the military authorities and the British Government to commit themselves to any indication of the probable period of Indianisation, subject to the necessary conditions of efficiency and the availability of suitable candidates, is one which it is impossible for Indians to appreciate. They refuse to contemplate the contingency of India proving unequal to the task of defending herself within a reasonable period. That the country is now unable to defend itself, no one is concerned to deny. But we believe that, if the policy of Indianisation were started in right earnest and carried out on sound national lines, it should be possible for us to train ourselves and undertake the responsibility for defence within a period of something like 35 years. If the Empire had to face the danger of another world-war on the same scale as the Great War, there can be little doubt that England would be obliged to train India for her own defence within a much shorter period.

Let us now proceed to consider the arguments urged by the military authorities in support of a dilatory policy of Indianisation. The plea that Indian capacity for leadership has to be proved by trial is one which cannot carry conviction to any reasonable mind. That a country like India, with its historical traditions and civilisation and with its vast population and varied classes, many of whom are not inferior in intelligence or martial spirit to the people of the West, cannot produce men with gifts of military leadership is a proposition which would *prima facie* be incredible.

Arguments for
dilatory policy
examined.

Capacity for military leadership was not unknown to Indian history. The numerous kingdoms into which India was divided often carried on wars with each other and maintained armies of their own. The Hindus, Mahomedans, and Sikhs all had their armies, led by their own generals. The Tamils and Telugus of Southern India, the Mahrattas of the Dekhan, the Rajputs of Central India and Rajputana and the Sikhs of the Punjab were not wanting in military leaders of ability.

Indian capacity for Military Leadership not unknown in the history of India.

If it is at all true that the capacity for military leadership has not been displayed in recent times in the Indian units of the army (see per contra Lord George Hamilton's tribute to the native officers in the Tochi Valley operations in his despatch of the 3rd February 1898), it is entirely due to the fact that Indians have been denied all opportunities for entering the commissioned ranks of the army and of cultivating any gifts of leadership. The successive changes in the organisation of the Indian army since the time of Lord Clive, and especially the changes introduced after the Great Mutiny, were all dictated by one supreme consideration, how to prevent the possibility of any rising on the part of the Indian soldiers and how to prevent them from acquiring any capacity for leadership.

Past policy directed to the suppression of capacity of leadership.

The Army in India Committee of 1912-13 referred to the risk of revolt having been reduced by the retention of the higher command and administration in the hands of British officers and by the consequent lack of opportunity for Indian officers to acquire the leadership

and the initiative which practice and responsibility could alone impart; and they regarded this as a most important safeguard. It was considered necessary to impress upon the mind of the Indian soldier a conviction of his permanent racial inferiority to the British soldier. The steps which were taken with the object of crushing the capacity of the Indian for leadership and the reasons which induced the authorities to take these steps will be found described in the report of the Peel Commission of 1858-59, the Eden Commission of 1878-79 and the Army in India Committee of 1912-13 and the evidence given before these committees. As observed by an English writer, it would have been a phenomenon, if the system adopted by the authorities in the training of their Indian soldier developed any capacity for leadership at all. It is adding insult to injury to suggest that the capacity of the Indian for military leadership is an unknown quantity and has yet to be established.

If the fitness of Indians for command can only be tested by experience of war-conditions, it is obvious that the fulfilment of this test depends upon contingencies not within the control of Indians. It has been said that after a period of 14 years' service it may be possible to judge of the fitness of Indians for command. The command of a unit is normally attained only after a period of 26 years' service and it is quite as likely as not that even after 14 years' service, it may be urged that the efficiency of the Indian soldier has not been subjected to the crucial test of war.

Tests proposed impracticable.

The distinction drawn by the military authorities between martial and non-martial classes is very largely artificial and the result of the military policy which has been followed by the Government with regard to recruitment for the army. This policy was founded not so much upon innate differences in the characteristics of the people as upon the distrust engendered by the participation of particular classes of soldiers in the Mutiny. Recruitment after the Mutiny to the army was determined by the opinion of the military authorities as to the reliability or otherwise of particular classes of people for loyalty to the Government. Several classes of people who used to furnish some of the finest material to the pre-Mutiny army came under the disfavour of the Government and were no longer drawn upon for purposes of recruitment. It is just as true that military qualities can be evoked or revived by suitable opportunities and training as it is that they may languish under unfavourable conditions.

The fact that the Simon Commission have endorsed this theory of the military authorities furnishes no proof of its correctness. Internal evidence shows that their remarks are an uncritical reproduction of some official memorandum. The soundness of this theory of martial and non-martial classes has been the subject of an elaborate and critical study by Mr. Nirad C. Chaudhuri, who has contributed a series of very able and illuminating articles to the *Modern Review* (see the numbers for July and September 1930, January and February 1931).

It would be useful to give a summary of the facts gathered from an impartial study of the history of recruitment of the British Indian Army.

(1) The theory of martial and non-martial classes was unknown in the pre-Mutiny organisation of the Indian Army. The three great Presidency armies which grew up in the three centres from which British power spread over the whole of India obtained their fighting material from their natural sources, *viz.*, the Madras army from the Tamil and Telgu countries, the Bombay army from Western India and the Bengal army from Behar and the United Provinces and, to a limited extent, Bengal.

(2) The principles of army organisation which were adopted after the Mutiny had regard not solely, or perhaps even mainly, to military efficiency. Political consideration relating to the method of securing the safety of British rule played the most important part.

(3) The maintenance of equilibrium between different regions and classes and the prevention of preponderance of any class were recognised as important principles in the organisation of the army. Every feature of army organisation that would have promoted *esprit de corps* and a sense of national unity and would have been regarded as a merit in a country enjoying national self-government was abnoxious to our British Rulers. Among the sources of danger which the authorities sought to remove were (1) the admission of the higher castes and the aristocratic classes who enjoyed a prestige in the social organisation; (2) the homogeneity of the units; (3) the too indiscriminate mixture of soldiers in the units which tended to break down mutual differences, jealousies and exclusiveness and

promoted regimental solidarity and (4) intelligence, education and capacity for initiative and leadership. Lack of intelligence and education, lack of any intelligent interest in the concerns of the outer world, came to be prized as virtues in the soldier.

(4) The measures which were adopted to avoid these dangers were (*a*) the formation of class companies in such a manner as to foster mutual prejudices and jealousies, (*b*) the intensification of diversity among the component elements of units and (*c*) the admission of the lower castes and classes.

(5) When it was found that military discipline and service in distant parts of the country tended to obliterate religious and caste differences and promote bonds of fellowship, the expedient was suggested that regiments should be, as far as possible, confined to the provinces in which they were raised so that they might continue to retain their traditional prejudices and mutual antipathies.

(6) It was during the time of Lord Roberts as Commander-in-Chief that the theory of martial classes was finally evolved.

(7) The military authorities were not, even in Lord Robert's time, advocates of the principle of combining maximum efficiency with maximum economy, but they were prepared to recognise higher or more important considerations like the avoidance of the preponderance of particular classes in the army.

(8) The Bengal Army, which before the Mutiny was regarded as a fine fighting machine, was almost exclusively composed of Hindustanees from Behar and the Doab, except that latterly a proportion of Sikhs and

Punjabees had been introduced. The principal castes of Hindus in the army were Brahmins, Rajputs and Ahirs. The Hindus formed the great majority. The Bengal Presidency ceased to be a recruiting area and the high-caste Beharees and the U. P. men were no longer considered to be one of the martial races of India.

(9) The decline in the efficiency of the Hindustanee sepoy referred to by Lord Roberts and Lord Dufferin was not due to the decline of the martial quality of the ordinary Hindustanee sepoy who fought so gallantly for the British both before and after the Mutiny and again during the Great War of 1914-18, but to the inclusion, after the Mutiny, out of political considerations and as a counterpoise to the high-caste soldiers, of unsuitable low class men such as Pasis, Dhanuks, Lodhas, Chamars and Mehtars who had never before or after served as soldiers.

(10) The disparaging opinion of Lord Roberts regarding the Mahrattas is contradicted by the opinion of General H. J. Warre, the Commander-in-Chief of the Bombay Army, and by their achievements during the Great War.

(11) The decline in the efficiency of the Madras Army was explained by Gen. Sir Neville Chamberlain as follows :—

“I admit that some Madras Infantry regiments do not come up to the proper standard; but this is not because of any inherent deficiency or defect in the material available. It has been, because of the regiments being badly commanded, partly arising from a rigid adherence to the claims of seniority, partly to the British officers having been cons-

tantly changed and partly to a loss of feeling of *esprit de corps* created by large reductions and a flood of supernumeraries and partly because the army has not had its fair chance of field service."

Sir Frederic P. Haines, the Commander-in-Chief, felt bound to reject the assertions ascribing comparative inefficiency to Madras troops.

(12) Whatever the truth behind the theory of the martial races, it is not proved by anything in the military practice followed in this country. The latter has never been sufficiently free from considerations of political safety to permit us to take it as a genuine test of the military potentialities of India and of the military capacity of the various tribes and castes. In their policy of combining absolute political safety with the maximum of military efficiency, Government have categorically denied the right of serving their country to millions of Indians who have forfeited their confidence or roused their suspicions by their political activities, educational progress or intellectual ability.

(13) Statistics relating to the proportion of soldiers from the different parts of India with regard to selected classes actually serving in the Indian Army on the 1st of January 1914, 1919 and 1930 show that the present-day proportions of the various classes bear no relation either to their war efforts or to their ratios in the army before the war. This want of correspondence is particularly noticeable with regard to the United Provinces, Madras and Behar. The Sikhs who formed the most numerous class in the army in 1893 have come down to the third place and the Punjabi Musalmans have now taken the first place.

(14) The comments of the Simon Commission on the war efforts of the different classes in India show no intelligent analysis or appreciation of the various causes affecting recruitment.

Mr. Chaudhuri's conclusions are amply supported by references to official documents and we reproduce in the appendix a few of the copious extracts which he has furnished in his articles.

As pointed out by Mr. Chaudhuri, the whole attitude of the British authorities in India in favour of the men of the North was due to the circumstance that, owing to the growth of the Russian menace by 1880, the North-West Frontier had become the principal theatre of operations for the Indian Army. The numerous tribal risings on the North-West Frontier and the necessity for guarding this vulnerable frontier which has been the gateway of invading hordes induced the Government to mass a large portion of our army in the Punjab. The military authorities found it more convenient to recruit their soldiers from the people who are near at hand, easily available and familiar with the terrain. The Government have also supplied the army of Northern India with the ablest and the most energetic officers who were most fitted to bring out the latent qualities of their men by training and organisation. As pointed out in Arthur's "Life of Lord Kitchener" (Vol. II, p. 125), "All this tended to damp the zeal and mar the efficiency of the Madras and Bombay armies, and not a little to foster jealousies between them and the Bengal army. Nor did the post-Mutiny reorganisation of the Indian military system do anything to

abate these heart burnings, and service in the other Presidencies became increasingly unpopular. Young officers who were ambitious, or could wield influence, strained every nerve to be posted to the Bengal Staff Corps with the result that the Madras and Bombay Staff Corps were always considerably under strength. The amalgamation of the three Staff Corps in 1891, the abolition of the Presidential armies in 1895 and the creation of Four Commands failed to popularise military service in Madras and Bombay, the conditions of which remained unhealthily stagnant."

One argument urged in support of the present policy of enlistment is that the men belonging to South India and other areas from which recruitment is barred cannot stand the climate of the North-Western Frontier and are averse to service there. Adaptability to climatic environments is one of the characteristics of human beings and service for a period of one or two years is likely to bring about the necessary adaptation. If this were a valid argument the British and the Gurkha soldier should not be enlisted for service in India or in expeditions to other tropical countries. During the wars in foreign lands in which Indian troops were employed, nothing was heard of the unadaptability of the Indian soldiers to the climatic conditions of other countries.

We are not concerned to deny the existence of geographical differences in physique, temperament or aptitudes. Differences are to be found even in the different parts of the United Kingdom and between county and county. The advocates of enlistment from select areas and races

**Climatic reasons
alleged for non-
enlistment.**

**Geographical variation
within a country not
decisive ground.**

forget how much improvement is, and can be, effected in the physique and morale of the soldier by the conditions of service in the army which ensure a nutritious diet and regularity of habits, drill and discipline, military surroundings and regimental traditions. The troops which played a part in the Peninsular War were described by the Duke of Wellington as having been "recruited from the scum of the earth enlisted for drink."

We have dwelt at some length on the history of recruitment and it may be said, that it is unnecessary to dwell on the sins of omission or commission of the Government in the past. Our object is not to sit in judgment on the past policy of the Government, but to point out the unfairness of blaming the people for the effects of a policy deliberately and systematically followed by the Government. These effects have been disastrous and the policy requires a change.

Whatever value may have to be attached to the professional arguments, the professional point of view is a narrow one and fails to take note of the requirements of the safety and progress of the nation all round. From this larger point of view financial economy is not the only consideration. Even the military authorities were not unalive to the importance of considerations overriding the claims of economy. (See the remarks of Lord Dufferin, in his minute of 8th December 1888. Collen's "Army in India during the Viceroyalty of Lord Dufferin," p. 19.) The welfare of all parts of India and the development of their self-sufficiency is an object which cannot be lost sight of by any national Government. Economy for the moment is not economy in the long run from the point of

**Financial argument
no justification of
enlistment policy.**

view of India as a whole. The provinces whose interests have been neglected in recruitment for the army would be morally justified in refusing to contribute to the pecuniary burden of defence. It cannot be maintained that the provinces and classes which have ceased to supply recruits have so irretrievably declined that their martial qualities cannot be revived by throwing open the doors of the army to all. Making allowance for the deteriorating effects of stoppage of recruitment among particular classes, it is an extravagant contention that entire provinces have so far deteriorated in martial qualities that they do not contain any classes capable of furnishing soldierly material for the army.

Unfortunate as its past policy has been in its effects upon particular classes of people, the present policy of the Government is calculated to perpetuate these differences and expose the peoples and provinces shut out from enlistment to the danger of domination by the classes listed as martial. This is one of the risks referred to by the Simon Commission as likely to follow the withdrawal of British troops and British officers. But the lesson drawn from this circumstance by the Simon Commission is not to the urgent need of training all provinces to bear their share of responsibility for defence. The lesson which for obvious reasons they draw is that the present military policy and the presence of British troops and officers must remain more or less permanent features of the Indian administration.

The remark of the Simon Commission that the military authorities are taking their share in the work of reducing the martial disparity between classes and

ances is just as incorrect as their inferences from the figures of recruitment to the army are fallacious. Apparently the formation of a territorial force and urban battalions is referred to. But the territorial force is treated in a step-motherly way, especially as compared with the Auxiliary Force, and the formation of an urban battalion was delayed for four years after the report of the Territorial Force Committee and only launched at an inauspicious time when the political unrest in the country had become intensified.

The proper remedy for the existing state of things is to throw open enlistment in the army to all provinces, classes and individuals, subject of course to the condition of suitability of the individual. It would be a tardy reparation for the injury caused by past policy. The removal of the bar against particular provinces and classes is one of the most urgent reforms called for in the organisation of the army. We plead only for the policy of an open door and not for the admission of the unfit. There need be no fear that persons with no military aptitude or inclinations will enter the army in large numbers and dilute the strength and impair the efficiency of the army. It is only those individuals that have any martial aptitude and instincts that will care to enter the army and be prepared to undergo the discipline and hard life of a soldier.

Political considerations have always had a share in all countries in determining the military policy of the country and India has been no exception to the rule. But the point of view from which the problem of defence

Policy of open door for enlistment called for.

Change of political outlook and its bearings upon the defensive organisation.

should be now approached is entirely different from that which has been hitherto adopted by the Government. The consideration which has hitherto influenced the authorities has been the best method of maintaining British rule over an alien population and for that purpose preventing the growth of martial spirit and leadership to an extent which might prove inconvenient and embarrassing to the Government. Now that responsible Government has been promised and that constitutional changes for the attainment of the goal are in sight, the angle of vision must necessarily be shifted and the primary consideration hereafter must be the evolution of a national army within a reasonable period.

Apart from the constitutional and political aspects of the organisation of the army it must be realised that modern war implies a conflict not merely between the armies of the belligerent countries, but between nations. War under modern conditions is carried on a tremendously larger scale than in the past and the successful conduct of it requires the utilisation of the whole of the manpower and the material resources of the nations engaged in the conflict. It is therefore essential that the army should as far as possible be drawn from all classes and areas and should assume a national character and that the responsibility for the defence of the country should be brought home to all sections of the population. This responsibility cannot be discharged merely by the payment of taxes to meet the military expenditure. Every class and community must be prepared to shoulder the burden of defence by willingness to serve in the army. It is a matter of familiar experience that for purposes of defence against external

**Importance of National
Army under modern
conditions.**

danger a national army possesses far greater moral strength and staying power than a merely professional army drawn from particular classes only. The military situation of India with its long frontiers is more analogous to that of the continental powers of Europe than to that of Britain. It is perhaps premature and inadvisable at the present moment to think of conscription.

It is absolutely necessary to give a new orientation to the policy of military organisation. **Need for new orientation of Military organisation.** Till the inauguration of the Montagu-Chelmsford reforms, the authorities gave no thought to the question of defence from the national point of view. The Esher Committee on the organisation of the army in India paid no attention to the national aspect of the question. The only committee which at all approached the problem from the national point of view, was the Auxiliary and Territorial Forces Committee presided over by Sir John Shea. But it dealt only with the organisation of the non-regular forces and its recommendations have not been carried out except in the most half-hearted manner. The appointment of a committee to examine the military organisation of India from a national point of view is one of the most urgent measures to be undertaken by a responsible, or even a semi-responsible Government of India. Such a committee must be charged with the duty of devising measures for uplifting the martial capacity of all provinces creating a national army imbued with a sense of patriotism and responsibility for the defence of the motherland, and preventing the domination of one area by another or of the civil population by the soldiery. Public opinion will refuse to accept the dilemma posed by the Simon Com-

mission that for the purpose of defence India must remain for generations either under the heel of Britain or under the heel of the enlisted classes.

Another reason advanced in support of a slow policy of Indianisation is that we are not sure of a steady supply of recruits for the King's Commissions.

Scepticism as to supply of candidates unwarranted.

We believe that when the field of recruitment is thrown widely open, there will be no difficulty in finding suitable recruits for the commissions to be thrown open to competition. The causes of the paucity of candidates in the past have been fully set forth in the report of the Skeen Committee. With the increase in the number of commissions to be offered every year, the opening of an Indian Military College and the reduction in the cost of military education to parents, there is no room for any misgivings as to the supply of suitable candidates. Even if the other provinces failed to respond to the offer, there would be no lack of suitable candidates from the enlisted areas. Sir John Maynard, the retired member of the Executive Council in the Punjab, informed the Skeen Committee that in the Punjab alone "there are many boys who do not appear for the Sandhurst examination, but are of better quality than the accepted Sandhurst candidates whom he himself had seen." We may refer also to similar testimony given by other witnesses before the Skeen Committee.

A further argument urged in favour of the policy is that it remains to be seen whether Indian King's commissioned officers, particularly of the non-enlisted classes, can command the confidence of men

Ability of officers of non-enlisted classes to inspire confidence in men of martial classes.

belonging to the enlisted classes, in the same way as the British officers. So far as the King's commissioned officers of the martial classes are concerned, there is no ground for any apprehension. But even in regard to Indian officer of the so-called non-martial classes, there is no reason to fear that if he has got the requisite capacity, training, tact and sympathy, he will fail to inspire confidence in the ranks. Moreover, there will be the British King's commissioned officer over him, and if the former is worth his salt, it would be his duty to support his Indian subaltern in the same way as he would support his British subaltern. Much of the success of the British officer whether in the civil service or military service of the Crown, is due to his confidence that he will be backed up by his superior officers in the discharge of his duties and receive their moral support.

It has been suggested that the experiment on a larger scale will expose India to risks with regard to internal security and protection against external danger.

Alleged risks of too large experiment.

We cannot regard these risks as probable or likely. The maintenance of internal security is normally a matter for the police organisation and the main argument advanced in favour of the presence of a large number of British troops and officers is that their impartiality would not be open to suspicion. With the growing national consciousness of the people and their aspirations to self-government, there will be less and less danger of a feeling of distrust as to the impartiality of Indian officers as a class. As regards the fear of external danger arising from a large addition of the Indian element to the King's commissioned officers of the army, it seems to

be equally fanciful. It seems to be forgotten that during the transition period, which must elapse before the Indian Army can be fully Indianised, the Indian King's commissioned officers will be trained and guided by the British officers above them, not to speak of the Viceroy's commissioned officers who have been described as the backbone of the Indian Army. This preliminary survey we have been obliged to make at some unavoidable length is the indispensable background of our remarks on the New Scheme.

We may now proceed to examine the main features of the scheme of Indianisation which has been put forward by His Excellency the Commander-in-Chief, and which are all intimately connected with the question of the annual output of cadets from the College. The three features of his scheme which are most open to criticism are (1) the principle of posting Indian King's commissioned officers only to the units selected for Indianisation, (2) the elimination of the Viceroy's commissioned officers and the organisation of these units on the pattern of the British Army, and (3) the pace of Indianisation of the officers' ranks. We will consider each of these features in order.

The policy of posting the Indian King's commissioned officers only to the units selected for Indianisation is the continuation of the principle which underlay the Eight Units Scheme and an extension of that principle to the larger number of units, comprised in one whole division of Infantry and one Cavalry Brigade, with all their auxiliary and ancillary services. This policy of differential

Salient features of new scheme of Indianisation.

Segregation.

treatment of Indian King's commissioned officers evoked universal criticism in India. It was strongly condemned by public opinion in this country and received with feelings of profound dissatisfaction by the Indian King's commissioned officers. It has been disapproved by the British officers of the units selected for Indianisation and has been unanimously condemned by the Skeen Committee, who recommended its abandonment. A distinguished and disinterested soldier like His Highness the Maharaja of Bikaner found so many demerits in it that he considered it unnecessary to go into details. (See proceedings: Sub-Committee No. 7, p. 73.)

We may first consider the arguments which have been adduced in favour of the principle of the Eight Unit Scheme which is now proposed to be extended to a whole fighting formation. It was explained by Mr. Brown, the representative of the India Office, before the Skeen Sub-Committee that there was a certain amount of uncertainty about the way in which Indian officers might develop, that it was conceivable that an Indian officer in a time of crisis might prove unequal to his responsibilities and that if young Indian officers served side by side with British officers of the same age, rank and standing, it was possible that the shortcomings of the Indian officer might be covered up by the British officers and his defects might be concealed. This was said to be one of the main considerations which led to the adoption of the scheme. It is impossible to accept this explanation as furnishing the real reason for the principle of the Eight Units Scheme, which, for brevity's sake, we may call the scheme of segregation. It must be first pointed out that

**Arguments in favour
of segregation.**

the principle of segregation cannot furnish the test proposed, as for a long time to come the Indian King's commissioned officer will always be serving under British officers and, even if the Indian officer played up to his responsibilities and stood the test of the crisis, his success could always be ascribed to the guidance and leadership of the British officer above him, just as it has become the fashion with English officers and historians to remark that the Indian soldier is excellent fighting material, provided he is led by British officer. If the argument really had any weight, it should tell even against the mixture of British officers of superior rank, just as much as against the mixture of British officers of equal rank in the Indian units. The real reason for the principle of segregation is the reluctance of British young men to take the chance of having to serve under an Indian officer and taking orders from him. This explanation was not vouchsafed at first, when the Eight Units Scheme was publicly announced by Lord Rawlinson in the Legislative Assembly or at any subsequent time. It was left to Mr. Young, the present Army Secretary, to lift the veil partially from the genesis of the scheme in a speech in the Assembly in 1928. He deprecated the idea of attributing the reluctance of the British officer to racial arrogance but contended that the British boys would cease to come out to the Indian Army if they had to face the prospect of serving under Indian officers. The explanation that he gave was ingenious, but not even plausible. He stated on the authority of the highest military opinion in India and in Britain that in fighting units an officer establishment of persons of widely different nationalities was not a practical proposition and could not be efficient. Even in the units proposed to be Indianised, the British officer

would continue and would be quite willing to serve so long as he was above the Indian officers. The objection of the British officer is not really to the mixture of persons of widely different nationality in the same unit; it is to the possibility of having to serve under a senior Indian officer that the British officer cannot reconcile himself. Though the true explanation has not been given to the Assembly, it has been frequently admitted by high military authorities that racial prejudices would never allow the British officer to take orders from a senior Indian officer and that if they had to undergo this risk, the flow of British officers to the Indian Army would stop. This fear and the device of segregating the Indian officer to counteract it were mentioned by General Chesney (in his "Indian Polity," first published in 1868) by Lord Roberts and by Lord Kitchener. Lord Roberts fought against General Chesney's proposal to grant commissions to Indians. He referred to the strong feeling inveterate to all ranks of the British Army that natives were neither physically nor morally their equals and remarked as follows :—

"It is this consciousness of the inherent superiority of the European which has won for us India. However well educated and clever a native may be and however brave he may have proved himself, I believe that no rank that we could bestow upon him would cause him to be considered as an equal by the British officer, or looked up to by the British soldier in the same way that he looks up to the last joined British subaltern." (Arthur's "Life of Lord Kitchener," Vol. II p. 177.) Lord Kitchener himself who was probably one of the most broad-minded Commanders-in-Chief who ever served in India, and was

in favour of the establishment of an Indian Military College and the admission of natives of India for higher military employment, referred to the deep-seated racial repugnance to any step which brought nearer the day when Englishmen in the army might have to take orders from Indians (Arthur's "Life of Lord Kitchener", Vol. II, p. 181).

It may be said that, whether justifiable or not, we strike here upon the bedrock of racial prejudice and that some weight must be attached to the fear of high military officers who are acquainted with the prejudices of their countrymen, and many of whom share those prejudices, that the admission of the Indian officer to serve along side of British officers in the same units might have an adverse effect upon British recruitment. But is there a real danger of such a result? The prospect of having to serve under Indian officers has not deterred Englishmen from joining the Civil Service. It goes without saying that the Englishmen who enter the Indian Civil Service are, as a rule, men of superior educational attainments to the Englishmen who enter the army. Why then should there be any falling off in the supply of English recruits in the army? The difficulties of obtaining employment are probably nearly as keen in England as they are in this country. Economic motives largely influence the choice of a career and they are asserting themselves more and more even in the military profession. Having regard to the emoluments open to a military career in the Indian army it is difficult to believe that they will fail to attract an adequate supply of suitable candidates. In his book on "The Army," General Macmunn sums up the advantages of a military career and points out that they include "a start in life at 20 years that is almost self-supporting and therefore

comparing most favourably with other professions, a living wage from early days and a moderate pension otherwise only obtainable by prolonged heavy premia and some allowances to widow and children." The emoluments in the Indian army are now better than in the British, and if British young men consider the situation coolly, they will be able to appreciate the advantages of a career in the Indian army. General Macmunn himself expresses the opinion "that the correct view is that if an Indian can negotiate fairly the tests and scrutinies that a British officer has to pass and that the army authorities alone are to settle, the senior Indian will be a remarkable man under whom any one may gladly serve." According to him, the British officer of the right type has an even brighter future than formerly but the lesser vessels may have a poorer one. It may, however, be said that the British public school boy class from whom the officers of the army are mainly recruited is one full of feelings of aristocratic superiority and racial pride and possessed of private means (report of the Lytton Committee on Indian Students, p. 18) and that any change in the conditions of army service may deter boys of this class from entering the army. But, as remarked by the Haldane Committee on the education and training of officers, "The type of education in the secondary schools available for children of parents in comparatively humble circumstances is now higher than it has been at any time in the past; and barriers social and intellectual, have been, and daily continue to be, broken down." If the haughty young aristocrat with his superiority complex does not care to enter the Indian army, there are sure to be plenty of boys who have received a sound secondary school education and who are likely to be more free from

social prejudices and will be attracted by the solid advantage of a career in the Indian army and the change will be probably all to the good. But assuming, for the sake of argument, that British recruits cannot be attracted on the basis of equality with Indians on terms consistent with Indian self-respect, India should be prepared to face the situation and learn to do without British recruitment.

Let us now consider the arguments against the policy of segregation of the Indian King's commissioned officer. They have been summed up in the report of the Skeen Committee. For the purpose of making this note self-contained, it is desirable to reproduce a summary of the criticisms which have been emphatically endorsed by the Skeen Committee. The first and almost universal criticism is that to confine Indian officers to the Indianised units is an invidious form of segregation and that every Indian officer should be given the same chance of selecting the unit to which he wishes to be sent, as a British officer. Several Indians who now qualify for King's commissions have family connections with particular units extending over many years and it is natural and laudable that they wish to continue their family tradition. In the case of British officers such a tendency is definitely encouraged.

In the next place, the test is, as formulated by the authorities, an unfair one and too severe to impose upon the first generation of the Indian King's commissioned officers who already have sufficient disadvantages of other kinds to overcome.

The scheme is also in conflict with the principle of co-operation between the Britisher and Indian which is

applied in every other sphere of the Indian administration for the purpose of securing harmonious work and to increase the efficiency of Indian personnel. With Indianisation proceeding in the army in any measure, the only means of ensuring successful Indianisation and concomitantly the maximum degree of attainable military efficiency is to allow Indian officers to serve shoulder to shoulder with British officers each learning from the other in every unit of the Indian army.

There is one other practical consideration to which the Sken Committee attach great importance. The Indian King's commissioned officer is still a new element in the Indian army to which the Indian rank and file have not yet had time to become fully accustomed. By the distribution of this element in all the units along-side of the British officers the new element can be absorbed with the least degree of questioning and the least derangement of the existing system of the Indian army taken as a whole. The Committee were of opinion that both for psychological and practical reasons the continuance of the scheme could only conduce to failure. The Committee therefore advised the abandonment of the Eight Units Scheme and of the principle of segregation.

It has been urged that the Indian King's commissioned officer will even in the Indian-
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 with offi
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 ised units have the opportunity of
 moving with his British superiors.
 But that cannot possibly have the same advantage as the opportunity of moving with equals of one's own age and status. This great advantage is claimed, from the psychological point of view, as one of the benefits of a system of public school education as distinguished from education

at home in the society of elders only. The system of posting Indian and English officers of the same rank in one unit will promote a healthy spirit of emulation and feelings of *camaraderie* and brotherhood which must be beneficial to the English and Indian officer alike. It is an irony of fate that the very authorities who have been loudest in insisting upon the training of the Indian cadets in the English Sandhurst as affording the opportunity of rubbing shoulders with British cadets of the same age and status should be so keen to deprive the Indian King's commissioned officer of a continuance of those advantages during the whole period of his service. As pointed out by Sir Valentine Chirol in "India," "the real explanation of the policy of segregation is something which goes even deeper than the racial objection of British officers to being placed in the position of having to take orders from Indian officers." He stated that responsible and experienced British officers who were proud of the confidence and personal affection of their native officer as well as their men were afraid that the Englishmen's prestige with the native troops themselves would be gone, if they were ever placed under other than British command (V. Chirol's "India," p. 279). The fact is there is far more affinity by culture and tradition between members of eastern races than between members eastern and western and it is much easier for one Indian to get into the skin of another Indian than for an Englishman. The late Lord Birkenhead remarked (The Indian Corps in France by Merewether and Smith, p. 472), "The intuitive and sympathetic British officer of an Indian Battalion can never be quite sure whether his outlook upon events, where those events have transcended their experience and his, retains any contact with that of his men. East is still East and West is still West."

To the objections pointed out by the Skeen Committee, we may add a few more of at least equal importance. The assumption underlying this principle of segregation and the proposal of a means of testing the value of the experiment of Indianisation is that every British King's commissioned officer is bound to make good and that the Indians as a class are likely to prove unequal to their responsibilities. We consider that, while individuals may fail among Indian as well as English officers, it is unjust to throw doubts upon the capacity of Indians as a class and accordingly relegate them to separate units. The Indian officer should be and is quite willing to face his responsibilities. But he is in justice entitled to ask that he should be tried under exactly the same conditions as the English subaltern. The system of differential treatment would lend itself to the suspicion that, while the defects and failures of the English subaltern will be covered up and concealed by the superior officers of his race, they would not regret the occurrence of opportunities for saying that the Indian subalterns were not equal to their responsibilities or could not command the confidence of their men. In view of the fact that high English officers are in the habit of constantly harping upon the inability of Indian officers, and especially of the so-called non-martial classes, to inspire the confidence of their men in the same way as an English officer, this suspicion may be easily created in the minds of the Indian officers. The extent to which *esprit de corps* may lead English officers to stand by each other has been happily portrayed in Galsworthy's "Loyalties."

Generalizations about
classes unsafe.

We may be permitted to quote a few extracts from authoritative opinions on the quality of British officers after the disaster at Tweebosch (6th of March 1902).

Quality of British officers.

During the Boer War Brodrick wrote to Kitchener that the public were insistent on the punishment of those whose carelessness or incompetence was responsible for the mishaps. Lord Kitchener replied to him that he quite agreed with Brodrick as regards punishment of those officers and men who by their carelessness or through other causes did so much harm. He considered it most necessary for the good of the army as a whole. He wrote, "one of the great faults in British officers is that they do not look upon their work sufficiently seriously at all times. They are in many cases spasmodic and do not realise the serious nature of their responsibilities and if they do so at one time, they easily forget them. If this is due to some extent to training, it seems to be a national defect based a good deal on over-confidence." (Arthur's "Life of Lord Kitchener," Vol. II p. 66-69.)

The Akers-Douglas Committee of 1902 on the training and qualities of British officers reported that the witnesses were unanimous in stating that the junior officers were lamentably wanting in military knowledge and, what is perhaps even worse, in the desire to acquire knowledge and in zeal for the military art. The Committee had been informed by a very high authority that the majority of young officers would not work, unless compelled; that "keenness is out of fashion," that "it is not the correct form; the spirit and fashion is rather not to show keenness and that the idea is, to put it in a few words, to do as little as they possibly can." By no part

of the evidence laid before them had the Committee been more impressed than by that which showed in the clearest manner the prevalence among junior commissioned ranks of a lack of technical knowledge and skill and of any wish to study the science and master the art of their profession. General Sir James Moncrief Grierson expressed the following opinion on the training of British officers:—"until the body of British officers becomes convinced that the days of playing at soldiers were over and that work in the fullest sense of the word must now be the watch-word, we despair of any attempt at re-organization. By the work we do not mean the daily duty, but study, hard study, which must be encouraged and fostered in every way by the authorities."

Giving evidence before the committee of enquiry into the conduct of the Boer War, Lord Roberts said that he had been compelled to remove five Generals of Divisions, six Brigadiers of Cavalry, one Brigadier of Infantry, five Commanders of Cavalry Regiments, and four Commanders of Infantry Battalions for incompetence, which was a very large number considering the number of troops employed. He went on to say "whether it is inherent in the British character, or whether it is owing to something faulty in the training of our officers, I cannot say, but the fact remains that surprisingly few of them are capable of acting on their own initiative.....
.....many of them do very well, if you can tell them exactly what to do and how to do it, but left to themselves they fail." (Report of the Royal Commission on the war in South Africa: Minutes of Evidence, Volume I, p. 446, Questions 10520, 10522, and 10524.)

Our object in making these quotations is not to disparage British officers as a class or to ignore their

merits. It is for the purpose of giving point to our remark as to the danger of generalising about classes from the conduct of individuals in times of crisis. It would be as unfair to disparage Indians as a class as it would be to disparage British officers as a class from particular instances.

If Englishmen cannot tolerate a position of equality with Indians even in this country the talk and the promise of equal partnership of India in the British Empire are meaningless. The whole policy underlying the scheme of posting Indians to separate Indianised units is utterly incompatible with the self-respect of the Indians and nothing will ever persuade them to the contrary. England will have to make up her mind whether she would prefer the certain risk of offending Indian sentiment, to the very doubtful risk of a check to the flow of English recruits.

We shall now proceed to the second essential feature of the scheme of Indianisation outlined by His Excellency the Commander-in-Chief. His Excellency informed us that it was decided that all units included in the Indianisation scheme should be organised on the British basis of officers, that is to say, that all officers down to platoon and troop commanders amounting to about 28 for each battalion or regiment should be King's commissioned officers. This involved the gradual elimination of the present Viceroy's commissioned officers. His Excellency was right in stating that, though it was announced by his predecessor in the Assembly, this feature of the scheme had not been grasped either by the public

Segregation inconsistent with Indian self-respect.

The elimination of the Viceroy's commissioned officers.

or by the army. Possibly this was a part of the Indianisation scheme as conceived by the authorities from the beginning. But implications of the scheme as to the elimination of the Viceroy's commissioned officers were never clearly pointed out till now. The proposals of the Shea Committee of 1922 for Indianisation proceeded upon this basis of abolition of the Viceroy's commissioned officers. But their report was secret and nobody knew anything about it till it was brought out from cold storage in 1928. In his speech in the Assembly in February 1923, when he explained the features of the Eight Units Scheme, Lord Rawlinson made no reference to this aspect of the scheme. It was for the first time referred to by Field Marshal Sir William Birdwood and by Mr. Young in their speeches in the Assembly in March 1928. But the full significance of the scheme was not realised by the public. In no country with even a shadow of responsible government would such an important measure affecting the organisation of the army have been hatched without the knowledge of the people. The fact that the Government have decided in favour of the adoption of the British pattern does not render the decision sacrosanct or immune from criticism by the public. This proposal for adoption of the British pattern in the Indianised units makes a revolutionary change in the existing organisation of the Indian army.

Let us first consider the arguments which have
 Arguments in favour of elimination. been advanced in favour of the proposal:

(1) It is said that the Viceroy's commissioned officer is indispensable as an intermediary between the British King's commissioned officer who belongs to

another race, and the Indian rank and file, but is unnecessary in the case of the Indian King's commissioned officer. It is also said that in no other country there are two types of commissioned officers in the army.

(2) It is said that all commissioned officers must take part in the training and leading of platoons and troops, and that if the Indian King's commissioned officer is unwilling to dispense with the Intermediary Viceroy's commissioned officer he must be deemed to shirk his responsibility.

(3) As both the King's commissioned officer and the Viceroy's commissioned officer belong to the same race and the same class, the Viceroy's commissioned officer would not obey the King's commissioned officer and friction might arise, making the position of the King's commissioned officer intolerable. It is also said that, if there is any difference between the Indian King's commissioned officer and Viceroy's commissioned officer in the matter of social status, the difference is in favour of the latter.

(4) It is also said that the Viceroy's commissioned officer is the backbone of the army and that his interests and prospects must be carefully maintained.

The present organisation of the Indian army has existed for a long time and there has been no complaint that it was defective or inefficient. On the other hand, it has been repeatedly acknowledged that the Viceroy's commissioned officer is the backbone of the army just as the permanent non-commissioned officers in the British army who come midway between the King's commissioned officer and the men in the ranks are said to

Onus of making out a case for changing an organisation which has stood the test of time.

form a wonderful body. It lies upon those who wish to introduce a radical change in the *status quo* to make out a strong case in favour of the change. The mere fact that the British army is organised on a different basis is not a sufficient reason for departure from the existing organisation. There is no reason to assume that the British pattern is a model of perfection and should be slavishly imitated elsewhere. Even supposing that the existence of an intermediate link between the King's commissioned officer and the rank is unnecessary it would furnish no argument for a change, unless it could be shown that the existing system has produced any evil results.

We do not wish to embark upon a discussion of the system of organisation of the army in other countries. The organisation in every country is adapted to its own circumstances and requirements, and there is no rule of abstract logic compelling any country to adopt the pattern of any other without regard to its own administrative necessities and other conditions. Whether the removal of any intermediate links between the King's commissioned officers and the other ranks is an improvement or not, we consider that it would be most inexpedient to introduce a change in the Indianised units without introducing it in the rest of the Indian army. We feel also that for the financial and other cogent reasons to be pointed out later on, the policy of eliminating the Viceroy's commissioned officers must be abandoned in the best interests of the country.

It has also been suggested that the Indian King's commissioned officer should take charge of his men and train them, just like the British subaltern in a British unit. Whatever may be the case in the British units,

**First argument
considered.**

**Second argument
considered.**

there is no justification for differentiating between the Indian King's commissioned officer and the British King's commissioned officer and imposing upon the former duties that are not laid upon the latter. If the Viceroy's commissions were abolished throughout the Indian army, both in the Indianised and the non-Indianised units, there might be something to be said in support of this plea. But if Viceroy's commissioned officers are maintained in the non-Indianised units and eliminated in the Indianised units, the maintenance of an invidious dual system would cause untold harm. It would certainly be treated as a brand of inferiority upon the Indian officer, lower his status and prestige in the eyes of the other ranks and render it impossible for him to discharge his duties properly or maintain his self-respect. The unwillingness of the young Indian officer to accept different treatment from that accorded to the British King's commissioned officer of the same standing cannot in justice be interpreted as a desire to shirk responsibility.

The argument based upon the social position and status of the Viceroy's commissioned officer and the likelihood of friction between him and the King's commissioned officer will not hold water. The higher social position of the Viceroy's commissioned officer as compared with that of the direct recruit to the King's commission exists only in the imagination of the Government and the military authorities. A superiority conferred by educational qualifications must always tell in favour of the King's commissioned officer and will be recognised and accepted by the Viceroy's commissioned officer who is wanting in such qualifications. Our colleagues who are

Third argument considered.

representatives of the martial classes do not apprehend the possibility of any such friction.

Fourth argument considered. The argument that the interest and prospects of the Viceroy's commissioned officers who form a valuable element in the army should be protected may be conceded. But it really does not help the contention that the Viceroy's commissioned officers should be gradually eliminated. So far as the prospects of the Viceroy's commissioned officers are concerned, they consist in the chances of promotion to King's commissioned ranks, whenever they may be found to possess suitable qualifications. So far as the prospects of the men in the ranks are concerned, their interest lies in the maintenance of the class of Viceroy's commissioned officers to which they may expect promotion by meritorious service and conduct. The military authorities are so full of tenderness for the Viceroy's commissioned officer that they wish to improve his class out of existence. It is not by abolishing the class of Viceroy's commissioned officers, but by giving them an opportunity for the King's commission that they must be encouraged to acquire higher intellectual qualifications. The private and the non-commissioned officer must be encouraged by maintaining the Viceroy's commission class and giving them a chance of rising to that class which alone the large majority would be fit for. In the case of the exceptional few men in the ranks who may possess sufficient ability and education, they may be given opportunities of securing appointment to King's commissions by admission to the military college. The abolition of the class of Viceroy's commissioned officers would remove all prospects of promotion for the other

ranks. Individual Viceroy's commissioned officers may be benefited by appointment to King's commission, but it is difficult to understand how the class of men who now rise to Viceroy's commissions can possibly benefit by the abolition of this class of commissions.

Some light is thrown by paragraph 14 of the Report of the Committee upon the genesis of the idea of the elimination of Viceroy's commissions. It had not taken shape in the mind of Lord Rawlinson in February 1923, though it had been put forward by the Shea Committee in 1922. The reason why the idea was not seriously considered by anyone was this. If the Officers' cadre in the Indian units could be wholly Indianised in 30 years, even if the Viceroy's commissioned officers had to be replaced by King's commissioned officers it was not worth the while of any member of Lord Reading's Government to examine the soundness of this proposal for elimination. Though the abandonment of this proposal might by itself tend to shorten the process of Indianisation, the need for protecting the rights of the existing British officers would prevent full Indianisation for about 30 years. The Indian members of Lord Reading's Government were therefore quite satisfied with the period and did not care to worry themselves about this proposal. Lord Rawlinson had definitely made up his mind about the policy of segregation so far as the 8 units were concerned. He could defend it in the Assembly as a device for testing the fitness and efficiency of the Indian King's commissioned officers. He went on to point out that "simultaneously with the Indianisation of these selected 8 Indian units, Indians who qualified for King's commissions will continue as at present to be posted to

the other units of the Indian army. The number of Indian cadets now sent to Sandhurst each year, if all pass out successfully, is more than sufficient to replace the normal wastage in the 8 units alone. I draw attention to this matter, as it has a significance which the House, I am sure, will not fail to appreciate." But his successor began to consider what should be done with the Indian King's commissioned officers after the 8 units had been Indianised under the present system. Should they be posted to other units with British King's commissioned officers or should they be posted to fill up Viceroy's commissioned vacancies? He must have evidently thought that the policy of segregation should be continued and must have evidently preferred the elimination of Viceroy's commissioned officers as the lesser of two disagreeable alternatives, to the course of allowing the Indian King's commissioned officers to be distributed in the other units.

The objective contemplated (the elimination of the Viceroy's commission) is bound to have a very detrimental effect upon recruitment to the other ranks, for their educational qualifications would be too poor to permit them to aspire to King's commissions and the only class to which they now look forward for promotion would have disappeared.

Another serious consequence of this proposal is that it would affect recruitment to the Indianised units and young men of mettle and ambition who wish to enter the ranks would prefer to enlist in the non-Indianised units which hold out prospects of promotion to Viceroy's com-

Objections to elimination of Viceroy's commissioned officers; adverse effect on recruitment generally.

Adverse effect on recruitment to Indianised units in particular.

missions. Recruitment to the Indianised units is bound to suffer in comparison and the efficiency of the Indianised units is thus bound to suffer.

The notion that, as education makes progress, educated young men will enter the other ranks of the army in considerable numbers with the ambition of rising to King's commissions through this avenue is unwarranted. In the first place, there are not a sufficient number of King's commissions to attract any considerable number of men to the ranks. In the second place, experience shows that, save under exceptional circumstances, young men of education, even in England, do not care to be recruited in the ranks. General Macmunn observes in his book that "In Great Britain, for reasons explained, it is usually the lad of the humblest classes, the least educated classes, who selects the military life. It would be safe to say that not 20% do so from love of soldiering and adventure. Want of employment, love quarrels, *res angusta domi* and the like, still must account for a far larger percentage of enlistment than is dignified, yet gives illogically the finest soldiery in the world." ("The Army" p. 70.)

Apart from the demoralising consequences of the proposed change on the Indian army and the Indian officers, there are two most serious objections to the proposal, one relating to the cost of the scheme and the other to the time required for complete Indianisation. The number of Viceroy's commissioned officers in one infantry division and one cavalry brigade is 312 and the cost of converting them into King's commissioned officers will throw a very considerable additional burden upon the finances of the country. But very probably the inten-

tion of the military authorities is to fix the pay of the Indian King's commissioned officers on a much lower scale than that in force for the British officers in the Indian units. What exactly is the scale of pay proposed, we have not been informed. The adoption of a differential scale of pay is bound to deter young men of self-respect and spirit from entering the commissioned ranks and doom the scheme of Indianisation to failure.

The next objection to the scheme proposed is that it will indefinitely prolong the period taken to completely Indianise the officers ranks of the division and the brigade selected for the purpose, not to speak of the Indianisation of the whole army. It has been stated that if British recruitment is completely stopped, it would take 35 years for the army to be completely Indianised. This is based on the normal figures of annual wastage among the King's commissioned officers. But if the Viceroy's commissioned officers are also to be Indianised, it must necessarily take a much longer period. Out of the 60 cadets proposed to be admitted into the military college, the annual output of commissioned officers, after making allowance for wastage, is expected to be 53. The number of commissions required to replace the vacancies in the British King's commissioned ranks of the Indianised division and brigade every year would only be about 20. The remainder of the output from the college must therefore be utilised for replacement of the Viceroy's commissioned officers. How many of the graduates of the college would replace British officers and how many of them would replace the Viceroy's commissioned officers, we have not been informed. But it is quite likely that

**Retardation of
Indianisation.**

they may first be posted to fill all the vacancies in the Viceroy's commissioned ranks, the surplus only being drawn upon to replace the English officers.

Yet another objection to the scheme is that side by side with the Indianised units there will be non-Indianised units in which the British King's commissioned officers will have opportunities for promotion and command, denied to the Indian King's commissioned officers in the Indianised units and any differential treatment would be invidious. The considerations we have adduced above should be sufficient to condemn the whole scheme in the eyes of the Government.

In any event the question of the adoption of the British pattern is one which should be left to the decision of the future Government of India after all the Indian units have been completely Indianised on the present basis. We have discussed this question of a change in the organization at some length in the hope that the Government may be induced to reconsider the decision instead of treating it as a settled fact. The zeal for imitation of the British pattern is liable to be ascribed, and not without a show of reason, to the sinister object of retarding the process of Indianisation as much as possible and not to the love of ideal perfection.

We now come to the third important feature of the proposed Indianisation scheme, and this relates to the time required for the Indianisation of all the Indian units. It has been already pointed out how the adoption of the British pattern of organisation and the proposal to convert all

Differentiation of prospects.

Question premature in any event.

Pace of Indianisation.

the Viceroy's commissioned officers into King's commissioned officers will necessarily tend to the prolongation of the total period of Indianisation. Apart from the bearing of the change of organisation on the length of the period required, it has been said it would take 35 years from the date of stoppage of British recruitment. *Prima facie* it might be supposed that no harm would be done even if British recruitment was stopped from tomorrow, for there would be British officers in the superior ranks of the Indian army to train, guide and direct the Indian officers for over a generation. His Excellency the Commander-in-Chief remarked that he could not take the responsibility of going beyond the Indianisation of one division of infantry and one cavalry brigade for the present. No doubt, His Excellency observed that his proposals were not of a static or rigid character, that after a period of 14 years commencing from 1924, it would be possible to form a definite opinion as to the success of the experiment and that it would not be necessary to wait for a further period of 7 years before deciding to carry the experiment further and that it would then be an easy matter to increase Indianisation by brigades or divisions. Assuming that on the lapse of 7 years from this date, the authorities would recommend the entire stoppage of British recruitment, the time required for complete Indianisation would be 7 plus 35, or 42 years. If, on the other hand, it was decided to stop British recruitment not completely, but only piecemeal, it would prolong the period still further. A scheme of this indefinite character will fail to satisfy Indian aspirations. If there was no proposal to abolish the Viceroy's commissioned officers or to segregate the Indian King's commis-

sioned officer in separate units and if there was also a proposal for a liberal initial intake of Indians and a progressive annual increment of Indian recruits and a corresponding decrease of British recruits for the commissioned ranks it might be possible to satisfy the demands of public opinion. There was undoubtedly a difference of opinion in the sub-committee of the Round Table Conference as to the stoppage of British recruitment and the laying down of a definite time table. But there can be no reasonable doubt that all the members of the Round Table Conference would have been in favour of starting the process of Indianisation with a liberal percentage of initial recruitment. This is apparent from the unanimous resolution in favour of a substantial increase in the rate of Indianisation, commensurate with the main object in view. Having regard to the opinions expressed at the Conference it would not be proper to suggest the immediate abandonment of British recruitment. It is still open to us to express an opinion on the question whether the Indianisation of one division and one brigade now proposed is, or is not a substantial increase in the rate of Indianisation, 'commensurate with the object in view.' Putting it crudely it may be said that compared with the 8 unit scheme the proposal to Indianise one Infantry Division and a Cavalry Brigade is a substantial increase but considering the entire strength of the Indian army now, the increase is neither substantial nor commensurate with the object in view. In coming to a conclusion upon this question, regard may legitimately be had to the proposals of the Government of India in 1922. The resolution of the Legislative Assembly in March 1921 which was accepted by the Government was that not less than

25% of the King's commissions granted every year should be given to His Majesty's Indian subjects to start with. We may also take it that the principle of an annual increment was not unacceptable to the Government, though they were not willing to commit themselves openly to any specific rate. Had a scheme of Indianization been started immediately, we should now have reached an annual Indian recruitment of 50% on the assumption of an increment of $2\frac{1}{2}\%$ every year. We do not think that an initial intake of less than 50% of the total number of commissions thrown open every year would satisfy public opinion. As to the further steps to be taken to carry on the process, two methods of progression might be suggested, either an annual increase of 5% in the Indian recruitment and a corresponding decrease of British recruitment, or a stoppage of British recruitment to be completed in two steps, one after a period of five years and the next, after ten years. The first alternative would work automatically and bring about the cessation of British recruitment after a period of ten years. But if the automatic principle is considered objectionable and it is necessary to be satisfied as to the flow of a steady supply of suitable candidates, the latter alternative would serve the purpose. According to either of these schemes, the progress of Indianisation of the Indian army will be completed within a period of 45 years. It must be remembered in this connection that according to the original proposals of the Shea Committee of 1922, the period suggested was only 42 years. Their revised programme, which was accepted by the Government of India, reduced the period to 30 years. We must not forget that in their supplementary report the committee expressed the opinion that

it was impossible to produce the very large number of educated, trained and experienced officers in a shorter time than 42 years. But this opinion was expressed upon the basis that the Viceroy's commissioned officers would be eliminated from the army, a proposal which has already evoked a storm of disapproval.

Perhaps the most important question included in the agenda placed before the Committee is the proportion of vacancies to be filled up by competition and nomination respectively. The importance of general education among the qualifications of officers is now being more and more largely recognised. Even in England, where the system of purchase once prevailed, selection by competition has become the rule and selection by nomination, the exception. Though a certain number of commissions are given to men from the ranks, the number of such commissions is very limited and the proportion of the vacancies filled up by nomination to those filled up by competition is very small.

The representatives of the enlisted classes on our Committee have pleaded for a large majority of the commissions being given to the members of these classes by the system of nomination. The grounds on which they base their advocacy are that it would not be possible for the Viceroy's commissioned officers and the non-commissioned officers and the private to reach the standard of general education prescribed for competition and that the boys belonging to these classes start their education at a comparatively late age and would not be able to satisfy the age requirement for entry into the military college. The argument necessarily proceeds upon the admission of back-

wardness in general educational attainments. No one would wish to deny opportunities for promotion to men of capacity in the ranks, provided they come up to the required level of fitness in point of education. There is no objection to the concession of special educational facilities to the sons of soldiers and officers who may be in need of help. Nor would any one be disposed to raise any objection to some relaxation of the upper limit of age for the grant of King's commissions. In spite of the educational progress which is claimed to have been made in the Punjab, and among the enlisted classes of this province during recent years, it cannot be denied that their education has not sufficiently advanced to enable them to compete in the entrance examination. It is because the enlisted classes cannot come in by the open door of competition that they plead for entry by the back-door of nomination. It is admitted by the military authorities that for several years to come, very few of the Viceroy's commissioned officers will be fit to be recommended for entrance into the military college. The same remark must hold good of the non-commissioned officers and the privates. A private cannot be recommended for admission to the college, until he has put in a certain number of years of service and attained the rank of a non-commissioned officer. It has been stated by military authorities that the lowest age at which a private can become a non-commissioned officer is 30, though it is generally 40. Viceroy's commissions too are attained by non-commissioned officers only at a later age. These two factors relating to the age and the educational qualifications of the non-commissioned officers and the privates have a most important bearing up-

on the successful Indianisation of the officers' ranks in the army. Even taking into consideration the provision recently made for the special enlistment of promising young men of ability, the age at which non-commissioned officers and the Viceroy's commissioned officers can obtain King's commissions must ordinarily prevent them from rising to the higher ranks of the King's commissioned offices in the army; and the process of Indianisation must therefore be necessarily delayed. The admission of officers who are below the level of general educational qualifications prescribed must seriously interfere with the success of Indianisation. To admit a large proportion of such officers to commissioned ranks would be to court the failure of the whole scheme. It is on these grounds that we are unable to agree to any large proportion of the King's commissions being offered for appointment by nomination.

The contention that King's commissions must be distributed in proportion to the number of recruits furnished by different classes of the population is untenable. In countries which have not adopted the system of conscription, recruits are generally furnished by the labouring and the uneducated classes and not the educated or the upper classes. If it is contended that the upper ranks of the martial classes should be rewarded, because the lower classes of these communities furnish recruits the claim rests on no principle. To reward one man for service done by another is absurd. The only principle upon which commissions should be awarded is the basis of individual fitness and not membership of a class which furnishes recruits. In paper No. 4 of the supplementary papers to the Peel Commission Report, General

Jacob strongly condemned recruitment on the basis of membership of any race, tribe or caste (see page 79). Mere military training or membership of a military caste cannot make up for deficiencies in general education. According to the existing practice, 16 out of 25 commissions are filled by competition. Of the remaining 9, five are given to the Viceroy's commissioned officers and four are filled up by nomination by the Commander-in-Chief out of those who have obtained qualifying marks in the entrance examination. This works out to a proportion of 16 for competition out of 25 or a little over two-thirds. The Skeen Committee recommended that 80% of the King's commissions should be filled up by competition and 20% by nomination by the Commander-in-Chief from among those who have obtained qualifying marks in the entrance examination. The necessity for enlarging the field of recruitment was emphasised by Sir Malcolm Hailey and by the Skeen Committee. Sir Malcolm Hailey expressed the opinion that it was not advisable to make the preference in favour of land-owning and Military classes a fixed item in the policy of recruitment, and he thought that the process of education among the other ranks would produce its inevitable result in reducing the preference which the other ranks may feel for officers of particular classes. It was also emphasised by the Round Table Conference. Unless the number of commissions available for competition is largely increased, we cannot expect young men to come forward in sufficiently large numbers for the competitive examination. Nor is it possible to expect educational institutions to introduce any changes to adapt themselves to military requirements. We are therefore of opinion that the proportion of competitive vacancies

should be fixed in accordance with the recommendation of the Sken Committee, *i. e.*, at 80%.*

Having regard to the low educational qualifications of the Viceroy's commissioned officers and the Y. Cadets, we think that the reservation of 20% of the commissions for nomination from among both these classes is ample. We may mention that according to the recommendations of the Lee Commission on the superior Civil Services the proportion reserved for promotion from the Provincial Civil and Police Services was only 20 per cent. The fear of the enlisted classes that they will not be able to obtain an adequate number of King's commissions by competition is not well-grounded. It must be remembered that candidates with military inclinations are more likely to come forward from these classes than from others. The very high maximum allotted to the test of Interview and Record is also bound to weigh the scales very considerably in favour of candidates belonging to the enlisted classes. In the second place, the advocates of this view ignore the educational progress which is being made in the Punjab. Lastly a policy of protection for particular classes is not merely unjust to other classes, but deprives the former of all stimulus to progress. We do not consider it necessary to dwell upon the well-known arguments in favour of open competition as the means of excluding favouritism and attracting the best talents. One argument which weighed with the official members

*On a fuller consideration I now agree with Sir Sivaswamy Aiyer in fixing the proportion of competitive vacancies at 80% as against 66% which I had previously suggested in the Committee.

G. R. RAJWADE.

(see para. 14 of the Report of the Committee) in deciding to allot 50% of the vacancies to Viceroy's commissioned officers is that if the Viceroy's commissions are abolished, prospects at least as attractive must be substituted for them for the benefit of the young soldier. But if Viceroy's commissions are not abolished, as we contended they should not be, this argument falls to the ground. The military members of the Committee were at first inclined to allot not more than 40% of the vacancies to the Viceroy's commissioned officers and proposed 50% for open competition.

We regret that we have been obliged to take a different view from our colleagues on **Conclusion.** the fundamental principles underlying the scheme for an Indian Military College. The issues involved are of such vital consequence to the best interests of the country that we have been compelled to deal with them at considerable, though not unnecessary, length in the hope that our arguments may induce the Government to re-consider and examine their policy. We have endeavoured to discharge our duty with a desire to appreciate the official point of view and with a due sense of responsibility informed by such study as we have been able to bestow, in the case of one of us during a long period of service in the profession, and in the case of the other during such opportunities as have been available in the last ten years in connection with Lord Rawlinson's Military Requirements Committee of 1921 and otherwise.

G. R. RAJWADE, P. S. SIVASWAMY AIYER.

MAJOR-GENERAL.

Dated Simla, the 2nd July 1931.

APPENDIX.

1. Giving evidence before the Eden Commission of 1878-79, Sir Richard Temple remarked:—

“In India under British rule, the former martial tendencies of the native population gradually become lessened till they almost disappear and this circumstance is considered to be one of the safeguards of our rule. So conscious has the Government been of this, that within the present generation the native population has been generally disarmed, that is, the people have been enjoined to give up their arms. The Government never passed its Indian subjects through the ranks, nor sent them to their homes in the vigour of life. On the contrary, it has heretofore never parted with its native soldiers till they were pensioned in the evening of life. Therefore, to train them, to keep them for a limited time, either with the colours or in reserve, and then altogether to discharge them without pension to their homes in numbers increasingly large...would be to ensure a constant influx into the civil population of military men no longer bound to Government and to infuse again into the people a part of that martial spirit which has been disappearing, and the disappearance of which is still advantageous to us. This would be different from the past policy of the Government, which is still as sound as it ever was, and would militate against those maxims of political safety which are likely to continue as imperative in the future as they have been in the past and are in the present.” (Appendix to the Report of Army Committee of 1878, Vol. I, p. 191-2.)

Lieut-General Warre, the Commander-in-Chief of the Bombay Army, stated: "I have always been under the impression that the restoration of the martial spirit in India would be fatal to our supremacy."

2. Speaking of the Bengal Army, Lord Ellenborough wrote:—

"It is distressing to think that we must abandon the hope of ever seeing a native army composed, like that we have lost. It was an army which under a general it loved and trusted, would have marched victorious to the Dardanelles". [Report of the Commissioners appointed to inquire into the organisation of the Indian Army (Peel Commission Report) 1859. Appendix to Minutes of Evidence, p. 6].

3. Sir John Lawrence's memorandum on the homogeneity of the Bengal Army:--

"Among those defects (of the pre-Mutiny Army) unquestionably the worst, and the one which operated most fatally against us, was the brotherhood or homogeneity of the Bengal Army; and for this particular defect the remedy is counterpoise. Firstly, the great counterpoise of Europeans, and secondly, that of the various native races. Had the old Bengal Army had all these remedies applied to it ten years ago.....it would have been a much better army. [Report of the Peel Commission (1859) Papers connected with the re-organisation, etc., p. 14].

4. Sir John Lawrence's remarks on the importance of keeping up rivalries and differences:—

"To preserve that distinctiveness which is so valuable, and which while it lasts makes the Mahomedan of one country despise, fear or dislike the Mahomedan

of another; corps should in future be provincial, and adhere to the geographical limits within which differences and rivalries are strongly marked. Let all races Hindu or Mahomedan, of one province be enlisted in one regiment and no others, and having created distinctive regiments; let us keep them so against the hour of need. By the system thus indicated two great evils are avoided, firstly that community of feeling throughout the native army and that mischievous political activity and intrigue which results from association with other races and travel in other Indian provinces." (Peel Commission Report, Papers, etc., p. 30).

5. General Mansfield's proposals for the heterogeneity of the regiment:--

"Let all castes and let the Musalman share and share alike in the regiments of the local armies.

There may be low caste corps, and Musalman corps.

Other regiments may be formed of companies of different castes and in all these should probably be a company or two of Musalmans. Uniformity in these respects is neither desirable nor advisable. The more diversity that can be introduced into the constitution of the different corps, the better, so that in case of any future combination the heterogenous character of the various regiments may present an effective bar to it." (Peel Commission Report, appendix to minutes of evidence, p. 100.)

6. Major-General Tucker's memorandum on the introduction of factors for separation:—

"Talk as we will of the beneficial effects and the paternal character of our rule, we can never alter that fact that in India we are foreigners and interlopers; and

while we remain what we are, the natives of Hindustan what they are, the haughty and offensive conscious manner the consequence of our superiority, morally and intellectually--will remain indelibly stamped in the bearing and character of the European, out-weighing all the material benefits we can confer; and it is opposed, therefore, to all experience and to commonsense, to suppose that ever under any circumstances the natives in their inmost hearts can become reconciled to our rule as a class. This has never been sufficiently understood or insisted upon. Nevertheless, it is and will be found ultimately to be the truth; and it speaks forcibly for the strong necessity which exists for so dividing and separating into distinct bodies the 'different nationalities or castes' the rulers in our eastern dominions may deem it safe and expedient to entertain in our armies, so as to render them as little dangerous as possible to the State which they undertake so solemnly and faithfully to serve, but to which solemnity they, be it always remembered, attach little or no real meaning or importance, and by which, as we have seen, they are in no way really bound.

Seikhs, Rajpoots and Goorkhas constitute perhaps the best description of men for soldiers in Bengal and there are endless varieties of others; while the low castes will doubtlessly meet with great favour, after the events we have experienced so recently. It is, however, essential to be alike cautious with them all, and we should be most guarded and watchful with the Seikhs. Of these, one fourth part would prove an ample proportion, of Goorkhas and Hillmen generally a like number, if procurable, but the real Goorkha is not to be found in any large numbers; an-

other fourth part, of low caste men of all sorts, and the rest must, it is presumed, be made up of the endless varieties of Hindustanians and Musalmans usually employed. The introduction, however, of other different elements would be advisable, if it can be done, Africans, Malays and Arabs; anything in short, to divide and so neutralise the strength of the castes and nationalities which composed our armies in the East." (Peel Commission Report, appendix to minutes of evidence, p. 10.)

7. On the degradation of the native officer:—

"The founders of the native army had conceived the idea of a force recruited from among the people of the country, and commanded for the most part by men of their own race, but of higher social position.....men, in a word, of the master class, accustomed to exact obedience from their inferiors. But it was the inevitable tendency of our increasing power in India to oust the native functionary from his seat, or to lift him from his saddle, that the white man might fix himself there. So it happened, in due course, that the native officers, who had exercised real authority in their battalions, who had felt an honourable pride in their battalions, who had enjoyed opportunities of personal distinction, who had felt an honourable pride in their position, were pushed aside by an incursion of English gentlemen, who took all substantive power into their hands, and left scarcely more than the shadow of rank to the men whom they had supplanted. An English subaltern was appointed to every company, and the native officer then began to collapse into something little better than name.

As the degradation of the native officer was thus accomplished, the whole character of the Sipahi army was

changed. It ceased to be a profession in which men of high position, accustomed to command, might satisfy the aspirations and expend the energies of their lives. Thenceforth, therefore, we dug out the materials of our army from the lower strata of society and the gentry of the land, seeking military service, carried their ambitions beyond the red line of the British Frontier and offered their swords to the Princes of the Native States". (Kaye and Malleon History of the Indian Mutiny, Vol. I, p. 153-54.)

8. On the exploitation of the Sikhs' animosity towards the Hindustanees :--

"It was not because they loved us, but because they hated Hindustan and hated the Bengal Army that the Sikhs had flocked to our standard instead of seeking the opportunity to strike again for their freedom.

They wanted to revenge themselves and to gain riches by the plunder of Hindustani cities. They were not attracted by mere daily pay, it was rather the prospect of wholesale plunder and stamping on the heads of their enemies. In short we turned to profit the *esprit de corps* of the old Khalsa army of Ranjit Singh in the manner which for a time would most effectually bind the Sikhs to us as long as the active service against their old enemies may last". General Mansfield in appendix to the minutes of evidence, Peel Commission Report (1859), p. 97.

See also General Hancock's evidence before the Peel Commission:-- "The feeling of the Punjabees and the heart with which they served us, was partly owing to this sort of national or quasi-national feeling on the part of the Punjabees against the Hindustanee people;

they had no compunction in plundering their cities and working against them". (Peel Commission Report minutes of evidence, p. 242.)

9. General Hearsey on the stoppage of recruitment in Oudh, the Doab, etc. :—

"I am strongly of opinion that recruiting should cease in Oudh, the Doab of the Ganges and Jumna, in Shahabad and Bhojpur, and in Rohilkund and Bundelkhand, that no soldiers from these districts should remain in the regular army of Bengal.

That recruiting from the Punjab Seikhs, Punjabee Musalmans, hill tribes of Kamaon, Ghurwal, Sirmoor, Bussaihir, Chumba, Lahool, the Dogras of the lower Kashmere hills, men from the hills of Muree, the Hazarah hills, even the wilder tribes of Kohat, Khyberes, Mohmands and the hillmen of Damun Koh, the tribes that herd cattle on the Punjab rivers, the Jats of Kausi Kissat, the Daud Pootras of Bhawalpur, the inhabitants of the Shekawat country, the Rajputs of Rajputana, the Beloches--all might be entertained for the regular army.

No more Brahmins, no more Musalmans of Hindustan proper to be entertained in the regular native force." (Peel Commission Report, supplementary papers connected with the organisation of the army, p. 169.)

10. Major-General Cotton on the North-West Frontier recruits:—

"The newly raised troops of the Peshawar and Mooltan frontiers, and of the adjacent countries in and bordering on our territory, who have so well served us in our difficulties, and by adhering to or espousing our

cause saved us at a most critical moment, are no more to be depended upon than any others...Already do they feel their importance as the saviours of our tottering government. Already do they feel the power which we have placed in their hands and they have before their eyes the baneful example of rebellion, which has been shown them by their Hindustanee neighbours, tending to prove that our Government has hitherto been placed on an insecure foundation." (Peel Commission Report, supplementary papers on the re-organisation of the army, p. 121).

11. Upon the desirability of recruiting ill-educated, lower classes of Nepal:—

"The Brahmins and Thakurs may be considered the aristocracy of the country, and together with the Khas represent its intelligence. The lower castes are, as a rule, ill-educated and somewhat obtuse...Magars and Gurungs are invariably soldiers or agriculturists; they are far and away the best classes from which to enlist. The Gurungs are the least civilised and least Hinduised of all Gurkhas. They eat both beef and pork, which the Magars and others do not. The Khas are more or less under Brahmanical influence, and more national than the Magar and Gurung, and therefore less suited for employment in the Bengal Army." [Barrow-Sepoy Officer's Manual (2nd edition), 1887, p. 100.]

12. Sir Frederic Haines on the principle of equilibrium:—

"Distinct in race, language and interests from the more numerous Army of Bengal, it is, in my opinion, eminently politic and wise to maintain these armies (the Madras and Bombay armies) as a counterpoise to it; and

I would on no account diminish their strength in order that a reserve composed of what is called 'the most efficient fighting men whom it is possible to procure' may be established. If by this it is meant to replace sepoy of the Madras and Bombay by a reserve of men passed through the ranks of the Bengal Army, and composed of the same classes of which it is formed, I would say that anything more unwise or more impolitic could hardly be conceived." (Appendices to the Report of the Special Committee of 1879, Vol. I, p. 151).

13. Lord Dufferin on the principle of economy:—

"Here also there is a great deal to be said against the proposal to reduce them. I have brought this question several times to notice, but hitherto my military colleagues have not seen their way to effect any reduction.....Undoubtedly there are many considerations besides those of economy, which present themselves in discussing this question. Although some of the regiments of these armies are not well adapted for severe campaigns, it is considered by some that they are sufficiently good to act as the police and garrison of the country, and that it would be a mistake to trust entirely to the best fighting classes in India, while it would certainly be dangerous to allow any great preponderance of one particular class." (Collen "Armies of India during the Viceroyalty of Lord Dufferin," p. 19.)

G. R. RAJWADE,
MAJOR-GENERAL.

P. S. SIVASWAMY AIYER.

**INDIAN PRINCES
AS THEIR
PEOPLE SEE THEM**

**An inside view of the Administration of the State of
Navanagar of 'Prince Ranji'**

All the extravagance, inequities, and maladministration that would be seen depicted in the following pages are the outcome of protection, shield and encouragement, direct or indirect, that the mighty British Empire is extending to the princes of India. With motives far deep and methods far from honest or honourable, British Imperialists wish these princes—and sometimes do render active help to them—to develop into tyrannical autocrats of the worst-administered states. It is the Britisher in particular who is responsible to man and God for all the miseries of the dumb seventy millions of humanity in Indian States.

NAVANAGAR STATE

Area : 3,791 square miles.

Population : 3,45,353 Souls.

Treaty Relations : There is no treaty with the British ; Navanagar has only passed several bonds, undertakings etc. to the British, viz., (1) Undertaking to renounce piracy in 1808, (2) Fa'el Zamin bond, i. e., a sort of good behaviour bond in 1812, (3) cession of jurisdictions on various railway lines etc.

General : The State contains 85% of agricultural population. It has about 687 villages including 12 towns such as Navanagar and Khambhalia. Navanagar has a population of about 60,000 souls containing about a hundred graduates of law and art, enterprising merchants, and otherwise capable inhabitants. The town of Khambhalia is the native place of a number of merchant princes of Bombay. Some of the first rank politicians of the Bombay Presidency originally belonged to Navanagar State. On the whole Navanagar can boast of cultured and capable population that can stand shoulder to shoulder with neighbouring British Indian population in educational, intellectual and cultural equipment.

GRIEVANCES

- (1) No freedom of speech.
- (2) No liberty of the Press.
- (3) No liberty of person.
- (4) No security of property.
- (5) No Municipal Government by people.
- (6) No institutions to afford amenities to rural area.
- (7) No representative institutions.
- (8) No Legislation.
- (9) No trace of financial position, no systematic accounting and no independent auditing.
- (10) Tyranny of Monopolies.
- (11) Tyranny of state trade.
- (12) Tyranny of pleasure hunts.
- (13) Tyranny of taxation.
- (14) Tyranny of compulsory labour.
- (15) Tyranny over Jagirdars.
- (16) Mad waste of public money over friends and entertainments.
- (17) Unparalleled huge expenses on the person of His Highness.
- (18) Public works and education money spent for royal pleasures.
- (19) Poverty of education, medical relief and other departments of popular welfare.
- (20) Hoodwinking the public.
- (21) The Bombay Advocate General on Navanagar Judiciary.

THE MATERIAL THAT WILL BE FOUND IN THE FOLLOWING PAGES IS COLLECTED MOSTLY FROM ADMINISTRATION REPORTS, GAZETTES, ETC. IN ADMINISTRATION REPORTS OF INDIAN STATES FIGURES AND HEADS OF INCOME, EXPENDITURE ETC., HAVE BEEN FREQUENTLY FOUND TO BE MOST UNRELIABLE, AT TIMES POSITIVELY MISLEADING, ALMOST ALWAYS UNCHECKED BY ANY INDEPENDENT AUDIT; AND YET THAT IS THE ONLY AVAILABLE MATERIAL FROM WHICH OUTSIDERS CAN BE ASKED TO JUDGE ABOUT REALITIES IN THE STATES.

3

(1)

No Liberty of Speech

An executive order has been promulgated in the state taking away the liberty of speech. The following is taken verbatim from the State gazette.

Vol. 54, page 291, dated 16th Feb. 1921 H. O. O. No. 84.

"All are hereby informed that no person, association or gathering should address a public meeting in political matters without the permission of the political secretary which should be secured in advance. Further, no political meeting of any kind should be held. Those who would act otherwise would be legally proceeded against.

(Sd.) G. B. Desai
For Political Secretary."

14-2-21.

The year of promulgation was 1921 A. D. The order is in force till to day. Even for social and religious meetings permission is considered necessary. The gagging is so complete that in the last 7 years not more than half a dozen social and religious meetings have been held in Navanagar.

Let it be explained here that there is no distinction made in the state between executive orders and legislation. Both have the same force and both are being promulgated without any fuss of form by the same executive authority at any moment they please.

(2)

No Liberty of the Press

There is no State Legislation concerning the Press; nor have the press laws of British India been adopted either bodily or in spirit. The situation is therefore this; that there is no Press law. The Pressman, has, therefore to please the gods of the secretariat to secure permission, which however is denied to all political papers. For social or religious papers also, the editor has to sign a bond of Rs. 500/- and give an undertaking that he would not discuss any political questions in his paper. Even for discussion of social and religious matters, the editor often receives oral warnings from the secretariat.

In the state, there is one monthly magazine 'Social Servant' edited by one Mr. Gokuldas. At the time of getting permission he had to sign a bond of Rs. 500/- and give an undertaking that he would not discuss any political questions. He has been warned more than once, even regarding his discussion of social evils etc. Here is a copy of the order of permission.

No. 86 of 1927.

"Thakkar Gokaldas Hirji of Jamnagar is hereby permitted to edit and publish the monthly magazine "Samaj Sevak" subject to the conditions laid down in his recognizance bond of Rs. 500/- executed by him before the First Class City Magistrate Jamnagar.

Jamnagar
4th June 1927

(Sd) I. J. Chhaya
District Magistrate
and
Sir Nyayadhish
Navanagar State.

Countersigned
(Sd) P. B. Junarkar
Political Secretary
Navanagar State.

The following is the prescribed form of the bond :

' Applicant shall not touch any political matter or publish any writing likely to create any hatred or contempt towards the public.....In default, he shall pay Rs. 500 five hundred as penalty to His Highness the Maharaja...'

Whether or not, the pressman has contravened the provisions of the bond is left to the decision of the Political Secretary. No court of justice can enter the domain of the political secretary. A pressman is at the mercy of that mighty officer.

(3)

No Liberty of Person

There is no law guaranteeing the liberty of person.

No Judiciary in the state can issue 'Habeas Corpus' for the bodies of persons detained illegally by orders, oral or written, of the Maharaja or his officers.

A few out of many instances of violating the liberty of person are given below :

(1) One Sheth Premchand Keshavji, residing in Bombay but originally belonging to Navanagar, owning a newly built bungalow there, was arrested without any legal process and was long kept in confinement without any judicial trial. He was fined one lakh of rupees by an executive order. His bungalow now forms the guest house of the State.

(2) One Mansinhji Zala of Bodi was arrested without any legal process and kept in confinement for five long years without any judicial trial.

(3) One Mulji Nagji of Lalpur was arrested and kept in confinement in the same way for about three years; his brother, who went to his rescue, with a letter from a Bombay gentleman, was also jailed in the same way for about a year and a half.

All such arrests usually end after the victims consent to pay heavy fines.

Even to-day one person named Zino is in Police custody for the last eleven years; and one other person named Mulu Pachan is in the same condition for the last two years. Both of these unhappy victims of Jamsaheb's autocracy are to-day rotting at Jiva Satan's Dela in Jamnagar.

(4)

No Security of Property

Nothing but an executive order, oral or in writing, is necessary to wrest any property from any citizen. The following are a few instances in point :—

(1) One Vajubhai Motichand, a member of a most respectable bania family of Navanagar, was an agricultural graduate. He had made one rich and beautiful garden. He had spent some thousands after it. Even the state officer valued it at Rs. 45,000. But the Maharaja snatched it away from the owner and ordered that Rs. 5000 be paid as its price. The owner refused to accept the price. He lost heart, developed T. B., and later died disappointed. The garden, after coming into the possession of the State, has been a waste piece of land all these years.

(2) In old times, in the regime of the father of the present Maharaja, relatives and servants of the Maharaja were granted villages as permanent gifts by regular documents under the signature of the Maharaja. All such lands and villages numbering about forty have been confiscated by the Maharaja.

(3) For a pet dream of the Maharaja, namely to make a second Paris of Navangar, wholesale markets and streets were taken possession of and demolished by the State; and only nominal prices—so nominal that the price won't cover even the rent of the property—as compensation were given to the owners. No law, on British Indian model, giving proper price and compensation to the owners has been in force.

Cases of confiscations of big Jagirs etc. are treated separately under a different head.

(5)

No Voice of people in Municipal Affairs

In a city like Navanagar, the capital of 'Prince Ranji' so big, so cultured and so abounding in people of education and capacity, people have no voice in the administration of the Municipality.

Navanagar Municipality means not even a pretence of people's representation. One officer of the state administers the Municipality.

Navanagar Municipality is collecting a house tax, a conservancy tax, a wheel tax, octroi and most of other taxes on the analogy of the most advanced Municipalities run on democratic lines. It has a total revenue of Rs. 1,71,904, and yet the people have nothing whatsoever to do with it either in the matter of revenue or in the matter of expenditure, in any form or shape.

The city of Navanagar has two sorts of public roads; namely motor roads and public roads. Motor roads are being kept in up-to-date order at special costs. They can only be used by motor cars, which means Maharaja's cars generally, because there are only a few private cars in the city. Yet the state would not pay a single farthing for these roads specially used by it.

There are public roads on which also bullock carts cannot ply even though a heavy wheel tax is collected from these carts.

Situation is this: that a big number of those who pay the wheel tax is forbidden to use either motor or public roads; while the state who pays nothing, is the principal user of these roads. And most of the Municipal expenditure goes towards the maintenance of these roads.

Everything Municipal is to be decided by an officer of the State working under the guidance of the Maharaja.

(6)

No Municipal Amenities in Rural Area

Navanagar State possesses 12 towns and 675 villages. More than 85% of its population reside in villages.

Excepting the city of Navanagar other towns have no Municipality of importance. Between eleven towns together the total expenditure comes to about eleven thousand a year. The little work that is being done is entrusted to a revenue officer who controls all the expenditure.

But in villages proper, there is no semblance of any Municipal amenities; no sanitation, no lighting, no roads etc. Needless to say that there is no institution or body like the Local Board, Country Council, Panchayats, etc, either official or non-official.

The whole of rural population is absolutely without these amenities.

Outsiders are generally misled about the real situation about roads, when they see two long beautiful roads, one 57 miles long connecting Navanagar with Killeswar—Maharaja's health resort—and the other 40 miles long connecting Samana—Maharaja's Hunting Camp. These roads do pass near a number of villages. But no villager is permitted to ply his cart on these roads. Sign Boards are posted at different places saying '**Not for Carts**'; and villagers have only carts to ply.

Then there are special motor roads rules. Here is one extract from the same:

Huzur Office Circular Book No. 26.

"By circular No. 113 dated 13-5-21 it is ordered that none should ply carts on roads, built for motors; and that those found

breaking the rule will be punished. It is hereby repeated that no one should ply a cart on these roads nor any state servant should ask the cartman to ply the cart there. Any cartman or state servant found to be breaking the rule will be fined Rs. 50 fifty.

29th September
1921.

(Sd) G. B. Desai,
Revenue Secretary."

(7)

No Representative Institution

There is no Municipality in the State containing peoples' representatives.

There is no popular rural institution in the State.

There is no Legislative body.

There is no advisory body of any kind, through which people can express their wishes or views to the State in any matter.

And yet H. H. the Maharaja did declare before H. E. the Viceroy when the latter visited Navanagar in the ~~current year~~ as follows :

' We have tried to move with the times. Long before, I have established advisory council in which leading men from amongst my people are invited to deliberate and advise on questions of popular and common interest.'

The latest synopsis published by Navanagar State on the eve of the visit of the Butler Committee also makes the following mention :

' In March 1919 His Highness announced the institution of an advisory council. It consists of representatives of various interests. Its special feature is majority of non-official members ... The object of the Council is one of joint deliberation and advice on matters referred to it by the Durbar.

' An Agenda of the business to be transacted is prepared in advance by the Durbar and supplied to individual members. Council deliberates on subjects referred. Proposals made by the council are then submitted to His Highness for order.'

Now the facts about this are as under :

In the year 1919 Maharaja of Alwar was on a visit to Navanagar. On that occasion Maharaja Jam Saheb issued an order establishing an advisory Council and appointed certain gentlemen as members. It was at once summoned to meet. Maharaja Jam Saheb delivered an inaugural address; Maharaja of Alwar gave benefit of an oration; and it dispersed.

Nine years have passed since then and yet Durbar has never summoned it nor has it met again. Durbar has never referred to it any matter for joint deliberation and advice, nor has there been any joint deliberation. No Agenda has ever been prepared, none supplied to members. Members never met, never discussed any thing and never did they submit anything to Durbar.

And yet the Maharaja declared before H. E. the Viceroy and his synopsis reiterates the declaration to give one an impression that the Council is meeting and functioning!

(8)

No Legislation

Let it be borne in mind that sanctity of Legislation in its true aspect is rarely understood in Indian states. Limitation of executive power and sovereignty of law and justice are things almost unknown to them. Issuing authority of orders or circulars and of legislation is the same executive authority. Formality observed for promulgation of both is the same; i. e. both can be issued at any time without any fuss, at the sweet will of the executive. Effect or force of both is again the same. This general state of things in all states is true in Navanagar as well.

A circular or an order issued under the signature of a secretary treats a certain thing as an offence, determines punishment for the same and empowers anybody, a judicial or a non-judicial man, to exercise that power. Shikar rules, extracts from which are given in the chapter of Shikar and the order restricting the freedom of speech would illustrate the point.

Executive orders are issued taking away certain powers of civil and criminal courts, and giving the same to executive officers. Orders empowering the forest officer in Navanagar to try, settle

and otherwise deal with matters concerning shepherds and such class of people is an instance in point.

Seldom there is any legislation in Navanagar. Administration is run by orders, circulars and rules issued at the sweet will of the Maharaja or his Secretaries.

(9)

**No Trace of Financial Position ; No Systematic Accounting ,
No Independent Auditing.**

In the Administration Reports, there is a chapter named Revenue and finance; but one may search in vain to trace the financial position of the state in that chapter. Nowhere in the whole report can be found any trace of the real financial position of the state. ' Revenue and Finance ' chapter merely gives figures of revenue and expenditure to the date of the report and there it ends. It does not show what balance is then in hand, where the surplus money is invested, what the liabilities of the state are and such other things.

According to figures given in the synopsis on page 9, the state has saved Rs. 62 lacs in these twenty years of the rule of the present Maharaja. Where are these 62 lacs ?

With such a sum in hand, why has it been necessary for the state to issue loans for the Gargasagar Tank ? And why is there no mention of these loans in the Administration Reports ?

Navanagar state owes to H. H. the Gaekwar about Rs. 40 lacs; and about Rs. 25 lacs to the state of Gondal. Not a pie of these loans is paid still. Then, where are these 62 lacs ?

To-day the treasury of Navanagar state owes to merchants, contractors and other people not a few lakhs collectively ; their bills have remained unpaid because of the want of balance in the treasury. Then, where are these 62 lacs ?

About accounting, less said the better. The State may spend, on purely personal luxuries of His Highness, and yet the money can be, and as a matter of fact, is debited to any public expenditure head. Money spent after Kumars can be debited to education. Any expenditure can be debited to any head like that. That is the system. Hunting expenditure would be debited to Miscellaneous, journey expenses would be debited to the same head ; all motor cars

and entertainments money would be debited to Rayasat; all clothes-ornaments-jewels money would be debited to Jamdarkhana; and after everything that could conceivably be spent by the Maharaja has been debited to different heads in such a way, there would still remain the Maharaja's civil list! That is how the civil list is charged and then trumpeted in England, as was recently done by the Maharaja of Patiala. Yes, the Maharaja of Navanagar has a fixed civil list of Rs. 4,80,000, which in the year 1926-27 has been raised to 6 lacs to be pocketed by him over and above all his fanciful expenses debited in the manner described above.

No independent auditing

There are auditors in the state. They do audit accounts of different departments. But the real test of it is this: can these auditors object to the debiting of money spent for superfluous new palace buildings, to the head of public works department? Can they say that the hunting expenditure should go to the civil list? Can they ask for the correct financial position?

Jam Saheb has spent, as he says, Rs. 80 lacs after the port. In the administrative reports there is no head for this expenditure. It may be included in P.W.D. It may be included in Miscellaneous. But one does not really know under what head it is contained. And auditors cannot ask for these explanations. They cannot say that this should be a separate head; they cannot ask for even vouchers.

Auditors in Navanagar and everywhere in states can only examine departments at the bottom. They dare not examine things at the top. They are not the watchdogs over the finances and the financial position of the state. They can only prick in the petty things and harass small people.

No independent auditing is allowed, tolerated or even thought of in states, and none at all in Navanagar.

(10)

Tyranny of Monopolies

Over and above the monopolies of intoxicants like liquor, opium etc., there are a number of other monopolies; out of which the following deserve particular attention:

1. Monopoly of tobacco.
2. Monopoly of cotton.

You Shall Purchase Tobacco

Monopoly of tobacco is difficult to manage; but the same must be managed. So the state has issued no less than 179 different circulars to regulate the work and help the monopoly-holder.

All officers, judicial, police and revenue are enjoined by different circulars to help the monopolist in his business.

The following is an extract from a circular printed on page 300 of the State Gazette dated 1st May 1923 :

"As consumers of tobacco do not purchase the commodity in proportion to the use to be made by them, the monopolist suffers losses. Consumers of tobacco must convince the monopolist that they use the commodity from him. It is therefore ordered by this circular that the consumers of tobacco must satisfy the monopolist that they use his commodity; if they don't, it will be understood that they are using foreign goods and they would be punished in accordance with rule 60 of circular 8 of 30-7-21. Consumers must give satisfaction that they do not use non-state goods and use state goods; else they would be liable to punishment.

20 April, 1923

(Sd) G. B. Desai,
Revenue Secretary "

The following extract is taken from the booklet 'At the feet of Jamsaheb' from page 33 :

'The mamlatdar of Padadhari accompanied by one companion of the monopoly-holder went to the village of Visaman. They collected the villagers and reprimanded them for the less consumption of tobacco. The officer decided that it must be the result of some smuggling by them so he fined them all. It was then ordered that every consumer should purchase at least one pound and a half, or should pay the price for the same. From villagers refusing to agree to that, Mamlatdar took bonds to insure fulfilment of the order.'

Lest incomers in the state limits may smuggle tobacco, cigars etc., every one is searched while entering the state limits; and instances are on record that anyone found in possession of about say 25 cigarettes, is fined ten times the duty over it.

The monopoly-holder has been given a further right of having his dues collected as revenue collections. He has not got to go to Courts for the collection of his dues from the people.

Thus, tobacco smoking is made compulsory, in a way, in the limits of Navanagar State.

Cotton Monopoly

Monopoly of cotton presses has been given to Sheth Lalji for 15 years by Hazur order No. 16 of 26-7-1924. The following is an extract from the order :

"No cotton in the State shall go outside the State limits without being pressed in one of the two presses in the State limits...If anyone exports cotton without getting the same pressed in these presses, he will be fined Rs. five per maund."

The following is the resultant state of things :

There are two districts of Atkot & Bhadla, which too have cotton crops. These towns are only sixteen miles distant from the city of Rajkot, while for them the nearest state press is in Jamnagar which is 66 miles distant from them. In Rajkot the rates of pressing are Rs. 4-8 to Rs. 5-8 per bale, while in Jamnagar it is Rs. 7 per bale.

So both these districts have to go 50 miles more distant and pay about two Rupees more as pressing charges per bale.

(11)

Tyranny of State Trade

The state trades in salt. So the state salt must be consumed. The following circular of the state would give an idea how this system works.

"It is hereby notified that because the people of the state do not consume salt in proportion to their number, the following arrangement is made.

"Chief custom office will prepare tables showing the quantity of salt that ought to be consumed by each village and town. The same shall be forwarded to revenue clerks through their Mamlatdars. Every household shall purchase the quantity fixed accordingly. People be explained that they have to purchase salt according to necessity.

"Revenue clerks when on tour on villages of their group should see particularly whether or not salt has been consumed by householders according to tables prepared; if not, he should see that they do. He should provide for the necessary salt and give it over to the people. For this work he should take police help if he finds it necessary.

"Taluka Mamlatdars, Police Inspectors and police sub-inspectors should also look into these matters when they may be encamping in the villages.

5-1-1924

(Sd) Mahervanji Pestonji,
Diwan Navanagar State.'

Matters don't end here. Consumption is fixed at one half maund per head. A consumer himself should go to the Taluka head-quarters to purchase salt. Whether he does or does not take salt, he has to pay to the treasury the price for the salt.

In the tables prepared by the custom department, names of even dead persons may continue; and the family must consume the share of the dead man or at least pay for the same.

That is how the state makes profits out of this trade.

(12)

Tyranny of Pleasure Hunts

Shikar amenities afforded in the territories of the Maharaja of Navanagar have acquired a fame of their own. It is not so much the variety or wealth of shikar that has given this fame to Navanagar; but it is the great, luxurious and costly arrangements in the shikar camps that charm the guests. These shikar pleasures that are described by many guests of the Maharaja as veritable paradise are the outcome of various sorts of tyranny over the people. These tyrannies are threefold. (1) Tyranny of shikar rules. (2) Tyranny of shikar camps. (3) Waste of public money.

Shikar Rules

For the purpose of protecting beasts and birds of shikar, numerous circulars, orders and rules are published in the State Gazette.

The following are a few extracts :

From H. E. C. F. No. 22 dated 13-8-1909

".....If any breach of these rules is proved before a Magistrate, the offender will be punished with an imprisonment simple or rigorous, for six months; or a fine extending to Rs. 100 or both..."

From a circular No. 22 dated 1st November 1923, State Gazette page 54, issue 4, vol. 43 :

"Police and revenue officers, as also the Patel and Mahajan of the village, should see that rules of shikar are strictly observed by people. Breach of Shikar rules will be inquired into by the special officer appointed by His Highness, if he so chooses. That officer's orders shall be considered final and legal."

From a circular dated 24-4-19 :

"A new species of deer are now moving free in the land. If any one harasses or injures these deer, he would be punished with five years rigorous imprisonment and a fine of Rs. 1000."

Panthers, deer and various other birds and beasts are declared as Shikar birds and beasts. Harassment to them, even in self-defence is made a crime. An army of keepers is constantly on move in villages to detect these crimes. These keepers, if they choose to harass any villagers, have merely to present a report to the special officer, who, on the evidence of these keepers, would either fine or jail offenders pointed out by them.

Even if a beast damages crops or injures or kills the human being, the beast cannot be touched or attacked or resisted by the villagers. The following are but a few instances in point.

- (1) Seven merchants of the village of Nagaja were accused of putting to flight some partridges. They were arrested and kept in confinement for two days, and were subsequently released on payment of a fine of Rs. 100 each.
- (2) One patel of a village was charged of killing a panther. He was fined Rs. 1000 and was deprived of his patel rights.
- (3) In the Village of Bhalsan one old dame belonging to the caste of untouchables, was pounced upon by a panther and killed. None could go to her rescue, because that may be harassment to panther and as such punishable.
- (4) In the village of Sumeri, one shepherd boy was wounded by a panther. But none would go to his help.
- (5) In a family of three brothers, in the village of Raliya there was only one male child as an heir to all three. While out for play in fields, a panther came and killed the boy. None could help him.
- (6) An only son of a Brahmin widow of Upleta was killed by a panther in the same fashion.

Shikar 'Veth' or enforced labour

When Maharaja or his guests are camping for shikar, hundreds of labourers are requisitioned for various kinds of work in connection with the camp. Every village will have its turn to send batches of labourers according to the necessity. Number in each batch would vary from 10 to 100.

Expenditure

Expenditure of shikar is such as would stagger the world. One big camp, say, for a couple of days at Samana, costs not thousands but lacs: so great and perfect are the arrangements made that it has now been a proverb that "Jamsaheb creates paradise in jungle"

(13)

Tyranny of Enforced Labour

State reports and documents speak of 'Veth' or enforced labour as having been totally abolished. But any one who has an occasion of visiting Shikar camps would be instantaneously disillusioned. Batches and batches of villagers are brought from villages to Shikar camps. Villages will have their turns to labour compulsorily for Jamsaheb's Shikar luxuries. These villagers are kept for days together in the camp and given only food and a very trivial sum of two to three annas per head. The point is that they are brought on compulsion; they have to leave their work and go and stay in the camp. These batches consist so often of some fifty men per village; and many villages have to send their batches at a time.

(14)

Tyranny of Taxation

The Maharaja thinks of levying a tax one morning and issues such orders an hour after. There is no law or rule governing the levy of taxes which can prevent him from doing so. Most people

would know of taxation only at the time of collection. This is the situation prevailing in most of the states. Navanagar is one of them and taxes are as many as the genius of the Maharaja or his Secretaries can invent. Here is a list of them :

For city people

1. Octroi i. e. tariff on all sorts of things imported in the city.
2. House tax.
3. Conservancy tax.
4. Wheel tax.
5. War loan tax.
6. Grazing tax.
7. Ghee production tax.
8. Ghee import tax.
9. Brokerage tax on things imported.

For non-agriculturist people in villages

1. Ubhad Vero i. e. a tax per head on all non-agriculturist people as follows:

| | Rs.a.p. |
|---|---------|
| 1. Bankers, grocers, drapers and other-wise Good traders per head | 4-0-0 |
| 2. (a) Ordinary traders | 3-8-0 |
| (b) Artisans like carpenters, tailors etc. | 3-8-0 |
| 3. (a) Blacksmiths | 3-0-0 |
| (b) Agricultural labourers | 3-0-0 |
| (c) Cotton carders, weavers and such others | 3-0-0 |
| 4. Other professionals not coming in above classes | 2-0-0 |
| 5. Shepherd etc. | 1-0-0 |
| 6. Beggars like brahmans, fakirs, Sadhus | 1-0-0 |
| 7. Propertyless people doing sundry labour | 0-8-0 |

2. Ghee tax.
3. Grazing tax.
4. Octroi.
5. Cotton tax.
6. Salt dues.
7. Famine fund.

For Agriculturist villagers

1. Assessment.
2. Property-right tax four annas per rupee of assesment.

3. Famine tax an anna per rupee of assess ment
4. Famine insurance fund.
5. Milch cattle tax.
6. Cotton tax.
7. Cattle sale tax.
8. Ghee tax.
9. Grazing tax.
10. Agricultural produce sale tax.
11. Miscellaneous assesment.
12. Girl marriage tax.
13. Marriage party tax.
14. Re-marriage tax.
15. Fruit-trees tax.
16. Raw Sugar pot tax.
17. Sugar Produce tax.
18. Postal tax.
19. Vegetable produce tax.

Be it noted that an agriculturist is paying more than 60 p. c. of his income as taxes including the land tax.

(15)

Unparalleled Personal Expenses

The Maharaja of Patiala in his first public speech in London under the auspices of the East India Association declared on the 24th July last that a number of princes had their civil lists fixed. The Maharaja of Navanagar is one of such princes whose civil list is said to be fixed. Now let the reader have an idea of the Maharaja's so called civil list from the following figures taken from the Navanagar State administration reports.

The year 1925-26, the boom year of the port income, had a revenue of Rs. 97,11,266.

The following are the principal items of expenditure :

Rs. 19,51,570 Palace expenses as follows:

- 4,80,000 Civil list.
- 4,05,706 Sundry palace expenses.
- 2,44,258 allowances etc. of the members of royal family and of the personal staff.

| | |
|-----------------------------|--|
| 54,253 | Expenses after Kumars. |
| 7,67,353 | Jamdarkhana including presents etc. (Jamdarkhana means the treasury of ornaments, Jewels, etc.) |
| Rs. 27,70,067 | spent principally for Maharaja's personal gratification as under : |
| 4,94,183 | Rayasat (This means expenditure on Maharaja's motors, carriages, horses as also expenditure after guests.) |
| 8,47,377 | Minor departments. (No description of these departments is seen anywhere in reports...In synopsis published by the state, agriculture and cattlebreeding are mentioned. No expenditure is incurred after cattle-breeding: while H. H. Maharaja's twelve gardens cost Rs. 95,000. For the rest, nothing can be traced anywhere. Money is understood to be spent as per directions of the Maharaja, which nowhere finds any mention in the reports.) |
| 8,29,602 | P. W. D. (Most of this money is spent after palaces and Motor roads) |
| 5,98,905 | Unforeseen (This too is nowhere accounted for.) |
| <hr/> | |
| Total Rs. 47,21,637. | |

Thus it would be seen that civil list is a mere name. Over and above the sum of Rs. 19,51,570 distinctly mentioned as palace expenses, greater part of Rs. 27,70,067 goes for the personal tastes and use of His Highness.

The year 1926-27 has even a worse story to tell. The following figures will be interesting.

| | |
|----------------------------|--------------------|
| 17,15,292 | Palace. |
| 14,32,798 | P. W. D. |
| 7,58,341 | Rayasat. |
| 18,55,750 | Minor departments. |
| 30,60,493 | Unforeseen. |
| <hr/> | |
| Total Rs. 81,22,673 | |

None knows how these huge sums debited to minor departments and unforeseen are spent.

But the years 1925-26 and 1926-27 were boom years. Let us take figures of the year 1922-23, an ordinary year.

The year 1922-23 shows an income of Rs. 64,42,170 ; while principal items of expenditure are as follows :

| | |
|-----------|--------------------|
| 18,27,600 | Palace expenses. |
| 6,50,917 | Rayasat. |
| 4,67,612 | Minor departments. |
| 7,00,564 | P. W. D. |
| 3,76,767 | Unforeseen. |

Total 40,23,460

Even if half of the last four items of expenditure be taken as expenditure for His Highness, we come to the figure of Rs. 30 lacs as Maharaja's personal expenses.

It means that His Highness the Maharaja Jam Saheb spends about 50 p. c. of the public revenues on his person and for his personal tastes and fancies.

Compare with it, the percentage of expenditure of H. M. the King Emperor of India or other Royalties of Europe.

Even after such huge expenditure on his person from the money of the people, His Highness seldom finds time to stay with his people and to work with and among them. Greater part of his time is spent in foreign wanderings. His love is not Navanagar, but the castle of Ireland, bought out of public money. Poorest people must pay for his fishing in Ireland or witnessing cricket matches in England.

Mad Expenditure after Guests and Entertainments

That His Highness the Jam Saheb is lavish in his expenditure after his guests is a fact now accepted even by himself. But very few might be knowing even the approximate figures of expenditure in this branch.

'Saurashtra' a vernacular weekly newspaper with a large circulation, has published these figures with a declaration that if at all it errs, it errs on the side of moderation.

| <i>Maharaja's Guests</i> | <i>Expenditure</i> |
|--|--------------------|
| Lord Sydenham | 7 lacs. |
| Lord Willingdon | 10 lacs. |
| Sir George Lloyd | 15 lacs. |
| Lord Reading | 15 lacs. |
| Lord Irwin | 27 lacs. |
| Maharajas of Alwar, Bikaner, Patiala, European friends, Agents, etc. | 18 lacs. |

Total 92 lacs.

The following are the detailed figures of expenditure at the time of the visit of H. E. Lord Irwin :

- 4,00,000 Purchase of new motor cars as under; 4 Chevroletts, 12 Fiat, 12 Ford, 4 Lanchester, 2 Rolls.
- 5,800,000 Purchase of a vessel 'Star of India'
 - 2,50,000 Price of the vessel.
 - 3,00,000 Overhauling expenses.
 - 30,000 Carriage expenses.
- 65,000 New dresses for the Police.
 - 50,000 Messrs Renkins & Co, Simla.
 - 15,000 Messrs Asquith & Lord, Bombay.
- 40,000 New concrete platform for the landing of H. E. the Viceroy at the Rozi port. (The platform is 5000 ft. long, 6 ft. wide, and 4 ft. high. The cost of cement was 15,000, the cost of labour was 25,000. The labour contracts were given to contractor Tejsi Mehta for Ra. 22,000; but as the work was to be urgently finished, he was promised Rs. 3000 more.)
- 15,000 Paper flowers of the length of about 8 miles; all the high school students were engaged in arranging these flowers for four days continuously.
- 2,00,000 Decorations on Roads (The contract was given to contractor Hosain Nensi.)
 - 5,000 Golden garlands.
- 1,50,000 Electric arrangements. (Contract for one lac was given to Oslers; fifty thousand for sundry bills of other contractors.)

| | |
|----------|---|
| 50,000 | New tents bought from Cawnpore. |
| 20,000 | Fire works. |
| 50,000 | Petrol and motor sundry expenses on the occasion. |
| 1,00,000 | State dinner. |
| 1,00,000 | Decorations in Samana Shikar camp (A new stone railing round the whole camp, a pucca metalled road round the whole railing, a new garden and a fountain inside, new marble statues, electric lights etc.) |
| 1,00,000 | New furniture. |
| 3,00,000 | New roads. |
| 35,000 | Photography. |
| 2,00,000 | Sundry. |
| 3,00,000 | Things that cannot be mentioned. |

Total Rs. 27,10,000

Tyranny over Jagirdars

There are various sorts of Jagirdars in the state. They are as under :

- (1) **Amran** : This was a separate state enjoying jurisdictional powers with an average yearly revenue of about two lakhs. Though carved out of Navanagar state, it had its direct relations with the British, quite independent of the Navanagar state. In former times when Navanagar state tried to harass Amran Darbar, British intervened and gave full protection to Amran.
- (2) **Jagirdars** that are cadets of the state, who have their rights guaranteed by the British Government.
- (3) **Other Jagirdars** like Sodhas and others have been the principal supporters of the state for hundreds of years; their rights are not guaranteed by the Government, simply because they thought it below their dignity to go to the British Government for protection, against their own master, even though in these days, guarantee could have been secured for the mere asking.

- (4) Personal servants who rendered meritorious services to the person of former Maharajas and were rewarded with villages in perpetuity by regular documents under the signature of the Maharaja.
- (5) Holders of Lands or villages given to by the state for religious purposes, or village servants who had lands for village services.

Now let us see what has happened with each class of these jagirdars.

- (1) Amran Darbar married a girl of the clan of the Maharaja Jam Saheb; for this alleged offence of his, a detachment of troops was dispatched to Amran. Darbar was arrested and then exiled; and his state was confiscated. Jam Saheb's contention has been that although he, that is, Jamsaheb had forbidden the marriage, the Darbar still married the girl. Darbar thus defied his order and defamed his clan.

Amran Darbar has proved to the hilt that he received the order only after the marriage was consummated. Further, he has proved that his family has been marrying daughters of Jamsaheb's clan. At times, the then reigning Jamsahebs have remained present and have given presents.

With all this in his favour, the Amran Darbar who once enjoyed an annual revenue of about two lakhs with civil and criminal powers, has now been turned into living on public charity.

And the British Government dare not interfere in the affairs of the great Jam Saheb.

- (2) Guaranteed Jagirs: as an instance the case of the jagirdar of Panchdevda has been treated in the last chapter.
- (3) Brave Sodhas, who are blood relatives of the Jams of Navanagar, whose heads were always first to be sacrificed for the throne of Navanagar, who were too proud and too attached to Jams to go to the British for their security, possessed 18 villages. Jam Saheb ordered such enormous quit rents to be levied on their villages that they had to give up possession of these villages to Jam Saheb. For the last eleven years all these eighteen villages are with the state and these once brave Rajputs have to wander and work for their bread elsewhere.

There were other unguaranteed Giras-holders too. They too came under this quit rent and most of them lost their lands.

For those Jagirdars who still stuck to their Giras, numerous circulars have been issued. The following is one of them :

Hazur Order

"It has been brought to our notice that heirs of alienees do not care to notify deaths of their predecessors; and consequently the Alienation settlement records remain in an incomplete state, which state of things, if allowed to continue, would eventually result in disputes about title and a necessity for fresh investigation.

Therefore, in order to avoid further disputes and to secure the continuity of the completeness of the Alienation settlement records, it is ordered that upon the death of an alienee, his heir or heirs claiming to succeed to his rights should notify the fact of the death within one month from the date thereof and on failure of the heirs of the deceased alienee to do so without sufficient cause, he or they shall forfeit their right to the holding.

4th April 1918

(Sd) Ranjitsinhji.
Maharaja Jam Saheb."

Numerous lands were confiscated under the above circular. Following are a few instances.

- (1) There were two brothers; Khengarji and Becharji in Bhalsan. Both were managing together their Giras. Khengarji died and Becharji could not inform the state authorities in time; so half of his lands were confiscated.
- (2) Ladhubha Shamji had three sons, father and sons all living together. Father died. Sons could not inform the state in time. All their lands were confiscated.
- (3) Latia Darbar Dajibhai Jibhai, his brother and nephews lived together. Dajibhai died; his brother could not inform the state in time. All their lands were confiscated. Most of the non-guaranteed lands were thus confiscated.
- (4) All lands and villages numbering about forty, given to personal servants etc. were confiscated.
- (5) Most of the lands given for religious purposes and to servants have also been confiscated.

Let it not be misunderstood that there was any regular or legal process adopted in doing all this. In most cases, Revenue Secretary merely ordered that land be confiscated; and they were confiscated! That is Jam Saheb's Government.

(18)

**P. W. D. and Educational Money Spent after
Royal Pleasures**

The state synopsis mentions six classes of public works executed by the State. Let us examine them one after another

130 Miles of new roads : 6 lacs

All these roads are called motor roads, and the public is forbidden to use them. The expenditure incurred on these roads must be much heavier.

New buildings of public utility : 56 lacs

Practically no school, or dispensary has been built by state money, except one vegetable market. No buildings of public utility are built by the State. Most of this money has gone after palaces.

City improvements : 20 lacs

This is problematical. The state has lost nothing. It has positively gained. In city improvement schemes it took away peoples' property at nominal prices: after keeping certain parts of the property for roads etc., it sold away the rest to people, securing on the whole, goodly gains in practically every scheme of improvement.

Bunds, causeways and reclamations of wells : Rs. 50 lacs

This is how this money has been spent. Navanagar, Killeswar Road and Navanagar Samana Road were to be built, because Killeswar is the health resort of Jam Saheb and Samana is the place for his hunts. So rivers and rivulets crossing the roads had to be bridged. All these expenses of bridging these rivers etc. have been debited to development purposes.

Navanagar Killeswar road has 15 bunds and 4 causeways.
Navanagar Samana road has 7 bunds.

But all this expenditure cannot go to more than nine lacs at the most. The following would give an idea.

| | |
|---------------------|--------|
| Navanagar Killeswar | 4 lacs |
| Navanagar Samana | 1 lac |
| Other Bunds etc. | 4 lacs |

It is therefore a problem how 50 lacs can be made up even if a little money spent after wells is added. But there is one solution. 130 miles of roads are shown to have cost only 6 lacs; that means only Rs. 4615 is the expenditure for one mile of a road. This is impossible. One mile will cost at least twenty thousand. So it seems that for the purpose of showing great expenditure on the bunds etc., meaning development schemes, most of the money, spent on roads is shown as spent after bunds etc. That is the only possible solution.

Electric Power House : 7 lacs

For a population of 45,000 of Navanagar, a power house of 7 lacs cannot be thought of. Even in cities like Ahmedabad and Karachi with population of more than two lacs each and with numerous industrial concerns using the electricity, the power houses of these cities have not cost more than two lacs. Most of this power in Navanagar is consumed by palaces, Government houses, camps etc.

Gangasagar Tank : 12 lacs

This is a really good and progressive scheme. But for that purpose Jam Saheb asked his people to subscribe to loans. Loans of about ten lakhs have already been subscribed, out of which only five lakhs have been spent to this date. Figure of 12 lakhs is not correct. But Navanagar or any state's figures are difficult to be challenged. Unless they submit their accounts to independent auditing, what other proofs can be brought to substantiate the challenge?

Education money : 15 lacs

In the state synopsis, on page 327, under the head Education and sub-head scholarship, the following is found :

'Suitable boys are selected for education in England. Four of His Highness nephews, all educated in England have received commissions in the Indian Army. The sum already spent in education of Rajkumars in England, in Rajkumar College Rajkot and in Jamnagar aggregates to about 15 lacs.'

Now let it be remembered that Jam Saheb Ranjitsinhji is an adopted son. In his new position as an adopted son, he has no brother and no nephews. All these nephews are his former relations and as such they do not belong to royal family, and yet Rs. 15 lacs of people's money are spent over their education, with what benefit to people one does not know.

(19)

Poverty of Education, Medical Relief and other Departments of Popular Welfare

This would be better understood by comparative figures taken from the administration reports for the years 1922-23 and 1923-24.

| Year | Income | Direct-Palace Expenses | Education | Medical relief |
|-----------|-----------|------------------------|-----------|----------------|
| 1922-23 : | 64,42,170 | 18,27,600 | 1,58,176 | 1,01,973 |
| 1923-24 : | 64,32,558 | 15,07,507 | 1,55,451 | 1,05,099 |

This means that

| | | | |
|-----------|----------|------|-------|
| Palace | consumes | 28.4 | P. C. |
| Education | consumes | 2.3 | P. C. |
| Medicine | consumes | 1.6 | P. C. |

of the total income.

This percentage of expenditure on people's departments has still gone down in later years as under :

| | 1925-26 | 1926-27 |
|-----------|-----------|-----------|
| Education | 1.8 P. C. | 1.5 P. C. |
| Medicine | 1.1 P. C. | 0.9 P. C. |

Following figures will be interesting :

Villages 675 : Villages with schools 184.

Population: 3,45,353. Number of students 15,505.

| Number of dispensaries | Number of liquor shops. | Opium shops |
|------------------------|-------------------------|-------------|
| 16 | 29 | 18 |

Don't these figures speak sufficiently ?

Hoodwinking The Public

So many specious statements are made and are being made by or on behalf of the Maharaja, that they really hoodwink the unwary public or even wary individuals. Hereunder are given some such statements with a real statement of facts side by side :

| <i>Statement made by whom</i> | <i>Statement</i> | <i>Real state of things</i> |
|---|--|---|
| A synopsis of salient features of His Highness the Maharaja Jamsaheb's administration of the Nayanagar state from 1907 to 1927 Page 12 | Establishment of advisory council in 1919; giving one to understand that it is working since then. | It has never met after the day of its establishment. |
| Do. Page 12 | Abolition of 'Veth' or Compulsory labour in any form whatsoever. | It is still prevalent. |
| Do. Page 18 | His Highness immediately on ascending the throne separated judicial and executive functions. | Revenue secretary Mr. G.B. Desai is the head of the revenue department. He is also the high court judge. He is also the legislator, some times alone and sometimes in company with the political secretary. |
| H. H. Maharaja Jamsaheb in the state banquet to H. E. Lord Irvin. | 'We have moved with times. We have established the advisory council.' | Nine years long before the date of this speech, the council was dead and has never been brought to life again. |

| <i>Statement made by whom</i> | <i>Statement</i> | <i>Real state of things.</i> |
|---|---|---|
| Prof. Raily, in the 'Manchester Guardian' reporting his talks with H. H. the Maharaja Jamsaheb. | 'When I ascended the throne 1/5 of the lands were uncultivated; now they are all cultivated.' | Total state lands to day are 18,08,193 acres; out of which total cultivated land to-day is 9,85,474 acres, according to the administration report for the year 1924-25. |
| Do. | There is one School for every village. | Villages 687: Villages with schools 184. |
| Do. | My agriculturists give me 1/8 share in a good year, 1/12 share in a bad year. | The agriculturists pay to-day in all 60 p. c. of his gross income to the state. |
| Do. | Eleven thousand new wells are sunk after my ascending the throne. | Hardly fifteen hundred wells are sunk. |
| Synopsis page 1. | Jamnagar is a first class state in Kathiawar. | Jamnagar is one of the eight first class states in Kathiawar. Its rank amongst Kathiawar states is third. |

(21)

The Bombay Advocate-General on Jamnagar Judiciary

The following is the verbatim opinion of Sir J. T. Strangman, Bar-at-Law, late advocate-General, Bombay, on the case of the Jagirdar of Panchdevda referred to in chapter 17 entitled 'Tyranny over Jagirdars.'

1. I am asked to give my opinion as to what course the Querist should pursue in the circumstances below set forth.

2. The Querist is a Bhayat of Navanagar. As such he holds 3 villages, namely, Panchdevda, Bajana and Babarzar.

In normal years the annual income of Panchdevda is Rs. 12,000/ or thereabouts, whilst that of the other two, taken together is Rs. 8,000 or thereabouts.

3. From the plaint referred to in para 6 here, it seems that K. S. Bhagwansinhji, the then Bhayat and father of the Querist, applied to the Bhayati Court of the Nawanager State on the 27th January 1884, for a Hak Patrak being granted to him and a survey being made of the village of Panchdevda.

* On the 14th February, 1884, the Dewan, in answer to a communication from the Judge of the Bhayati Court, replied:

"I having asked the Huzur as to what he desired to do in this matter, he has ordered that the said village (Mota Panchdevda) should be recorded in the Patrak of Bhayat Mulgirasia. You will therefore record in accordingly, and register the Hak Patrak (settlement of rights) thereof in a regular manner in the Bhayati Court and get a measurement made."

From a consent decree passed by then Court on the 18th May 1884, it appears that on the 2nd April 1884, no doubt in answer to such application, the State put forward claims to certain rights in reference to the village: and effect was given to those rights by a Decree of the 5th April 1884. With a view to satisfy the requirements of Rule 3 of the rules of the Rajasthanik Court, an agreement was recorded in the shape of a consent decree before the Bhayati Court abovementioned, between the State and the Bhayat on the 28th May 1884. being the consent decree abovementioned. The consent decree contains a list of the rights of the State and a condition against alienation by the Bhayat, and I take it that it merely repeated what was claimed by the State and contained in the previous decree.

On the 5th June 1885 the agreement was admitted by the Bhayat before an Assistant Political Agent and on the 9th July 1884 it was registered by the Rajasthanik Court. This agreement constitutes the Hak Patrak applied for.

* N. B. I take this from the Querist's letter to the Chief Revenue Officer dated 24-6-21.

4. K. S. Bhagwansinghji died in or about the year 1909 and was succeeded by the Querist, his son, who is now of the age of 30 years or thereabouts. The Querist was created Kumar Shri on the 24th September 1909 and Tazimi Sardar in the year 1918 or thereabouts by H. H. the present Jam Sahab.

5. On the 27th April 1921, it seems that the Chief Revenue Officer addressed the Querist stating the village of Panch Devla was with the latter's family as Jivai and calling upon him within 15 days to show cause why its settlement should not be made in accordance with the State Alienation Rules.

After obtaining time to look into the matter the Querist replied on the 24th June 1921 pointing out that a Hak Patrak had been granted as abovementioned and requesting the Chief Revenue Officer to disclose to him the evidence on which the notice had been issued so that he, the Querist, might give an explanation in the matter. No reply was sent to the Querist's letter.

6. On the 15th December 1921 proceedings were instituted in the Bhayati Court by the State against the Querist, the case being headed Misc. Case No. 6 of St. 1928. In the plaint it was alleged that the village of Panch Devla was in the possession of the Querist's father as Jivaidar and that he concealed this first in his application for a Hak Patrak as abovementioned. It was further alleged that the facts had come to light owing to a search in the State records undertaken by reason of some application of the Querist in June 1920. The prayers were for a cancellation of the Hak Patrak and its deletion from the register, for resumption of the village and an award of mesne profits from the beginning upto the time possession should be restored to the State. The claim to mesne profits would amount to upwards of Rs. 3 lacs.

An application was made for attachment of the village and for its Vahivat being done by the State and its produce being kept in deposit until the final decision of the case.

7. On the face of it the State would appear to have an extraordinary difficult task to establish a case of fraud over 37 years after the event, when all originally concerned are dead.

Even assuming that the Querist's father was at the beginning of the year 1895 a Jivaidar of Panch Devla and that he did not mention this fact in his application to the Bhayati Court for a Hak Patrak, non constat that this fact was not perfectly well known to the officials, non constat that the then ruler of the State did not change the tenure out of bounty.

In such circumstances, in a Court in British India no application in the nature of an application for a receiver pending the hearing would be entertained for a moment.

8. The hearing of the application for attachment was apparently fixed for the 3rd January 1922, but at the instance of the Querist was adjourned and ultimately heard on the 18th March 1922.

On the 15th April 1922 the learned Judge delivered judgment wherein he stated, *inter alia*, as follows:

"The question at present before this Court is whether order of attachment before judgment as demanded by the Darbari Vakil should be given or not. It appears to us that by granting attachment before judgment the defendant is not likely to suffer any loss and the Darbar Shree will find it convenient to recover his revenues and to ascertain the past revenues. It is therefore ordered that the Darbar Shree may place attachment over the village of Panch Devla and do its Vahivat and keep the produce that may be recovered in deposit in the Darbari Treasury pending this case."

This is an amazing decision. Firstly, to deprive a man of his village without any prima facie case being made out and secondly to tell him that he will not suffer any loss by such deprivation.

9. Meanwhile it seems that as a price of obtaining an adjournment of this extraordinary application the Querist had undertaken to the Private Secretary of H. H. the Jam Saheb that he would not measure Khalas (i. e. collect the revenue) over the adjournment.

What the Querist seems to have meant was that he would not collect revenue until the hearing of the application. What the private Secretary seems to have thought the Querist meant was that the latter would not collect revenue until the disposal of the application. I should point out that the Darbari Vakil did not ask for any interim order pending the hearing and disposal of the application in December 1921 or pending its disposal when it was heard in March 1922. After the application had been heard in March 1922 the Querist proceeded to collect the revenue. This was regarded by H. H. the Jam Saheb as a breach of the Querist's undertaking. On the 10th April 1922 the Querist was called before H. H. the Jam Saheb and fined a sum of Rs 5,000—to be paid within 24 hours. Here was a decision even more amazing than that of the learned Judge.

On the night of the 14th, 15th April 1922, it seems that the fine not having been paid, all the 3 villages of the Querists were attached.

10. On the 21st April 1922 the Querist had an interview with H. H. the Jam Saheb at the Taj Mahal Hotel in Bombay but without result.

11. On the 10th June 1922, there was published a notification in the Navanagar State Durbari Gazette to the effect the Darbari Vakil had submitted a Yadi to the Bhayati Court of the Navanagar State on the 28th April 1922 wherein he had demanded that K. S. Bhagwansinhji had died issueless on Vahishak Vad 1st of St. 1965 corresponding with the 6th May 1909; as he belonged to the class of Bhayats and as he had no direct heir, the villages of his possession (viz., the 3 above referred to) be resumed by the State; claims were accordingly invited on the 22nd September 1922.

Some 29 years after the Querist's birth, some 13 years after the death of his father, after he had been honoured by H. H. the Jam Saheb as mentioned in para 4, it discovered that after all he is illegitimate.

12. The chain of events is really remarkable. First it is discovered 37 years after the event that his father committed a fraud and Panch Devla should really be Jivai. Next he is fined Rs. 5,000 and all his villages are attached for what, assuming everything against him, was a mere misunderstanding. Lastly, it is discovered 29 years after the event that he is illegitimate (the discovery being one which would lead to a loss of all his villages).

13. The question is what should the Querists do. There are two courses open. One is to make peace with H. H. the Jam Saheb and I gather that the price would be an admission that Panch Devla was Jivai. The other is to fight. The first is easy if expensive. The second means litigation with a powerful opponent for a number of years. It will be both difficult and expensive. The querist tells me that he desires to take the second course. What then should he do to ensure success?

14. It is clear from the bare recital of facts as above that the Querist can look for no justice in Nawanager. His only possible chance of success is through the intervention of the Political Authorities.

These authorities have, I understand, already been approached with the result that the State was requested to stay proceedings in the Bhayati Court pending the return of H. H. the Jam Saheb. The request was made in September or October 1922 at a time when

H. H. the Jam Saheb was expected to return by the end of the year. I gather that it is now known that H. H. the Jam Saheb will not be back before the end of the current year. Meanwhile, all the Querist's villages are under attachment.

15. The Querist should again approach the Political authorities. He should ask that political advice be tendered to ensure

- (a) That all proceedings in the Bhayati Court against him be dropped.
- (b) That his villages be released to him and the revenue collected be made over to him,
- and
- (c) That the fine of Rs. 5000 be remitted.

If the authorities be doubtful as to prayers (a) and (c) in the absence of H. H. the Jam Saheb, he should in any event press for (b) and on the return of H. H. the Jam Saheb press for (a) and (c) also.

I can quite understand the reluctance of the British Govt. to interfere in matters which should ordinarily be dealt with by the Tribunals of an Indian State. Here, however, the title of the Querist is based on registration with the Rajasthanik Court, a British Institution. Further, it is clear that the State is determined to deprive the Querist of everything he has got, and lastly, it is futile to expect that the Nawagar Courts would afford any protection whatever to the Querist.

If a Judge could grant a drastic order depriving the Querist of his villages although no prima facie case has been made and then say it did not harm the Querist so to be deprived, there is no particular reason why on no evidence whatever he should not hold that the Querist's father was guilty of fraud, that the Querist is liable for mesne profits and that the Querist is illegitimate.

If ever there was a case in which the British Government should interfere, I should say it was this.

The Jagirdar of Panchdevda, who was always being described by Jam Saheb in his state documents and reports as his next kin, has been deprived of his all the three villages on the allegation that it has subsequently come to the notice of Jam Saheb that he was a got-up son. Panchdevda Kumar is fruitlessly struggling to get justice from the British Government, who have given a guarantee to his family for his Jagir.

It remains to add that if per chance the Political Authorities were to refuse to interfere, the Querist must appeal to the Bombay Government, and if needs be, right upto the Secretary of State.

HIGH COURT,
Bombay,
4-4-23.

(Sd). T. J. T. Strangman.