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THIRD AND FINAL REPORT

OF THE

Committee appointed to investigate the Dangers arising from Coal-Dust in Indian Mines.

CALCUTTA: GOVERNMENT OF INDIA
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Third and Final Report of the Committee appointed to investigate the Dangers arising from Coal-Dust in Indian Mines by the Government of India, Department of Industries and Labour, in Resolution No. M-498, dated 24th July 1923.

CONSTITUTION OF THE COMMITTEE.

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Mr. R. R. Simpson, C.I.E., Chief Inspector of Mines in India.

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Mr. J. B. Wardlaw, Mr. J. E. Phelps } nominated by the Indian Mining Association.

Mr. H. K. Nag, Mr. P. B. Basu } nominated by the Indian Mining Federation.

Mr. A. Farquhar, nominated by the National Association of Colliery Managers, Indian Branch.

Mr. J. Thomas, nominated by the Mining and Geological Institute of India.

Mr. J. H. Lang, Inspector of Mines,

and

Dr. D. Penman, Principal, Indian School of Mines (also Secretary).

Former Members.

Messrs. J. G. Foster, H. C. Read, G. Naysmith and P. Bates.

TERMS OF REFERENCE.

To enquire into the danger of explosions of coal-dust in Indian coal mines; to make experiments on different kinds of coal-dust with a view to determine their liability to explode or otherwise; and to report what means, if any, are necessary or desirable to provide against the risk of coal-dust explosions in Indian coal mines.

INTRODUCTORY.

In our First Report we gave a brief resumé of the evidence of the explosibility of coal-dust together with a record of certain preliminary tests of the inflammability of dusts from Indian coal

seams. We made also some general recommendations which in our opinion would reduce the risk of explosions both in fiery and in non-fiery mines.

2. In our Second Report an account is given of more elaborate tests of the explosibility of Indian coal-dusts, and we indicated certain directions in which our investigations might usefully be continued.

3. Recently a series of experiments was carried out at the Indian School of Mines on the friability of Indian coals. Owing to the lack of suitable apparatus for the purpose considerable difficulties were encountered in the carrying out of these tests. As a result the determinations were somewhat inconsistent. A general deduction was, however, indicated, *viz.*, that certain seams are more friable than others and produce a larger percentage of fine dust. The results obtained however are incomplete and do not warrant inclusion in this report or any attempt at a classification of Indian coal in order of friability. Dr. B. B. Banerji of the Indian School of Mines carried out tests on the ignition of fine coal-dust by electric arcs. An account of his experiments is given in Appendix VII. The tests were on a laboratory scale and showed that under certain conditions an electric spark can ignite an air-dust mixture. More elaborate tests in other countries have proved the possibility of an ignition of coal-dust by electric arcs. We do not, however, think that the risk from this source is comparable with the risk from shot-firing. The danger of an ignition of inflammable gas by electric sparks or arcs is however in a different category and must not be overlooked by those who use electricity in situations in which there may be accumulations of firedamp.

4. In 1928, two demonstrations on the explosibility of coal-dust were carried out, one before the members of the Coal Dust Committee at the underground experimental gallery described in the Second Report, and the other before the Colliery Managers Association in India at the Indian School of Mines, in the experimental gallery described in the First Report (*see* Appendix 2). These tests did not reveal any new data and were carried out chiefly for their publicity value.

Effect of the Presence of Coarse Dust on the Explosibility of Fine Coal-Dust.

5. The tests recorded in the First and Second Reports, with the exception of Test No. 52, were carried out on dust which had been artificially ground and sieved so as to eliminate all the coarser dust. As a consequence in those tests the concentration of very fine dust was higher than normally exists in the roadways and working places of a mine. Moreover, since all the coarser pieces of coal had been removed, there was no obstruction to the raising of the dust in a cloud by detonation or shot-firing. Where the dust is intermixed and overlain by coarser particles, as is usual in a mine and particularly so at the working face, the up-lifting

of the fine dust is to a great extent obstructed. The finer dust settles into the cavities and irregularities of the floor and is covered by the larger pieces of coal. This is a characteristic of the conditions of working places and mine roadways which has been noted and commented on by investigators in other countries, and it is of such importance that in some cases the failure of an initial explosion of firedamp to be propagated by coal-dust has been attributed not to the absence or insufficiency of fine coal-dust in the workings but to its having been prevented from being raised into the air by reason of the weight and size of the overlying coarser particles.

It may be concluded, therefore, that as a general rule the presence of coarser particles of coal in coal-dust has a considerable influence in reducing the risk of a coal-dust ignition or propagation. It should be noted, however, that the same argument does not apply to fine dust which collects on the roof and sides of a mine roadway. This aspect of the problem we discuss more fully elsewhere (page 9) in this report.

Additional Tests in an underground Gallery.

6. With a view to the testing of Indian coal-dusts under circumstances more closely approximating to actual working conditions than was done in the tests recorded in our First and Second Reports a series of tests was carried out in a portion of an old underground incline in No. 15 seam, Kendwadih colliery, Jharia, placed at the disposal of the Committee by the East Indian Coal Company, Limited. The dimensions of the incline are given in Fig. 1, and a description of the experiments is given in Appendix III.

In the first set of these tests slack coal collected from the floor and sides of a roadway in a mine was distributed on the floor of the experimental gallery so that the volume of the gallery over which the dust was spread was the same as the volume of the roadway from which the slack had been collected. The slack coal was not sieved in any way and was thus, as far as the methods of collecting the sample allowed, in the same state of division and presumably in the same relation with respect to mixing in the experimental gallery as in the mine roadway. In most of the tests charges of country-made gun-powder were used as the igniting medium. In one or two tests charges of gelignite were exploded on the floor of the gallery. In only two of the tests were ignitions of coal-dust observed. (Appendix III, pages 22 and 23).

7. We do not suggest that these tests are conclusive. They were carried out on a comparatively small scale in a gallery which had not been in use for a considerable time and in which there was no fine coal-dust remaining from previous operations. The dust used though collected from mine roadways as carefully as the conditions and means of collection allowed may not have contained the finest of the dust, which would naturally collect and settle in the smaller depressions and crevices in the floor and sides. Some

of the finest and most buoyant of the dust may also have floated clear of the area under treatment during the process of sweeping up the dust. Again we cannot be certain that the grading of the dust when laid on the floor of the experimental gallery was exactly the same as in the original state of the mine roadway. For obvious reasons it would be difficult to ensure absolutely similar grading in the two cases and, owing to the difficulties of making such tests, no grading tests were attempted. As far as possible, however, the dust was stirred up by foot before each test.

On the other hand the flame and concussion of the charges of explosives used were probably more intense than is usual in actual practice. The shot-holes, which were bored in the coal sides of the experimental gallery, were lined with steel pipes and the charges were abnormally heavy. These factors would undoubtedly to some extent counterbalance the possible deficiency of fine dust in the slack and the inaccuracy of the grading and distribution of the dust.

8. We are conscious also of the force of the argument that in a series of tests such as these, more weight ought perhaps to be given to one ignition than to a considerable number of non-ignitions. It is obvious to practical mining men that an ignition of coal-dust in a mine is not a probable contingency, as if it were so no mine would be safe and coal-dust explosions would be of every day occurrence. We have to deal with possibilities rather than probabilities. While therefore we realise that it would be unscientific and unwise to give too much weight to the results of these tests we opine that within their experimental limitations they indicate that the conditions must be more severe than is usual in actual practice before an ignition of coal-dust is likely.

9. In the second set of tests, contained in Appendix IV, tests were made on specially sieved dust. Slack was collected in the same way as for the tests described in Appendix III, but it was in this case sieved so as to obtain the included fine dust in three grades, *viz.*, dusts of sizes between 30 and 90 mesh, between 90 and 150 mesh and over 150 mesh. Three tests only were carried out and the igniting charge in all cases was a heavy shot of country-made loose gunpowder. The concentration of the dusts per cubic foot of air space in the length of gallery over which the dust was spread was in each case greater than the concentration necessary to form an inflammable dust-air cloud. No ignition was obtained with the two coarser grades, but a feeble ignition resulted with the finest dust.

These experiments although perhaps imperfectly staged from a scientific and practical view point indicate that fine coal-dust is more readily ignitable than coarse dust.

Visits to Representative Coal Mines.

10. In the course of our investigations we visited a number of representative collieries in the Jharia and Raniganj coalfields.

Our chief object was to see and examine the conditions as regards the presence of coal-dust. We visited three collieries in each field, and a brief report of the inspections is given in Appendix V. The general outcome of our observations may be stated as follows:—

Collieries in the Raniganj Coalfield.

11. *Colliery A. Seam—Dishergarh.*—Depth of shafts 1,500 feet. Conditions dry throughout. Inflammable gas given off. Stone-dusting applied throughout in the mine workings, except in a few working places where local watering is done. Permitted explosives are used where blasting is necessary. Ventilation good. The workings appeared to be adequately stone dusted.

Colliery B. Seam—Dishergarh.—Depth of shafts 1,175 feet. Conditions near the face of working galleries were usually wet but at a short distance from the face the roadway became dry and on several of the haulage roads the conditions were dry and dusty. Permitted explosives are used. The seam gives off inflammable gas. Ventilation good. Coal-cutting machines used extensively.

Colliery C. Seam—Poniati.—Depth of shafts 980 feet. Explosive used—gunpowder in tin tubes owing to the wetness of the shot holes. No inflammable gas given off. Ventilation good. Coal-cutting machines are in use. The haulage roads were moist and firm underfoot, all new drivings were wet, and depillaring areas were dry but not unusually dusty.

Collieries in the Jharia Coalfield.

12. *Colliery D. Seams Nos. 13 and 12.*—Depth of shafts 650 feet. Conditions in working galleries fairly dry, in depillaring areas damp, and on haulage roads in general dry and dusty. One part of this mine we would describe as dry and very dusty. The seam does not give off inflammable gas. Country-made gunpowder is used to a large extent. The coal in galleries is undercut mechanically. Ventilation good.

Colliery E. Seams Nos. 15 and 14-A.—Depth of shafts 400 feet. Conditions generally dry and in many places dusty. No inflammable gas given off. Country-made gunpowder used extensively. Ventilation good.

Colliery F. Seam No. 18.—Depth of shafts 450 feet. Permitted explosives used. Ventilation good. Haulage roads were damp and comparatively free from coal-dust, advancing faces were wet and depillaring places were dry.

13. Summarising, we may say that excluding Colliery A, which was dry throughout and in which precautions against the risk of coal-dust explosions are already being taken, the condition of the mines visited showed that the workings either in whole or in part contained deposits of dry coal-dust.

Analysis of Representative Samples of Coal-dust.

14. In our First Report (1) we discussed in a preliminary way the conditions as regards coal-dust in Indian mines and gave some results of screen analyses of dust collected in a typical hand-cut gallery in an Indian mine. These tests showed 11·76 per cent. of the dust to be finer than 150 mesh, and 47·97 per cent. to be below 30 mesh. The concentration of dust below 150 mesh was 1 lb. 7 oz. per 100 cubic feet of roadway or 0·23 oz. per cubic foot of volume.

At our request Mr. N. Barraclough, B.Sc., Inspector of Mines in India, with the assistance of Mr. B. Sen of the Indian School of Mines, made a large series of screen analyses of dusts collected in a number of mines in the Raniganj and Jharia coalfields (see Appendix VI). These collieries were the same as those visited by us and the dust was collected from places selected by the Committee.

Taking dust below 30-mesh and excluding Colliery A for the reason mentioned in the foot-note (2), it will be seen that the concentration of dust in the tests of Jharia collieries is higher than in the collieries tested in the Raniganj field. This may be accounted for by the fact that as observed by us in our visits of inspections the conditions in Collieries D. and E. (Jharia Coalfield) are on the whole drier than in Collieries B and C (Raniganj Coalfield). Another noteworthy point is that in many cases the ash percentage of the samples is high.

15. Perhaps the most significant point which emerges from these analyses is that the fineness and concentration of dust is greatest on haulage roads. For example in Colliery E, the concentration of dust below 90-mesh in a machine-cut gallery was 0·09 oz. per cubic foot of air space, while the average of two samples collected from haulage roads in the same mine was 0·171 oz. per cubic foot of air space. Similarly in Colliery D the values of concentration of dust below 90-mesh were 0·133 oz. per cubic foot of air space in a working gallery, and 0·22 oz., 0·16 oz. and 0·68 oz. per cubic foot of air space on haulage roads. The last value is particularly high and this was due to the use of a rotary tippler which produced much fine coal-dust at the place where the sample was collected.

General Conditions in Indian Coal Mines.

16. On the whole in our view coal mines in India are for various reasons neither so dry nor so dusty as coal mines in such countries as Great Britain.

As regards dryness, most of the coal mines in India are comparatively shallow; there are only a few over 1,000 feet deep.

(1) Paragraph 24, page 20.

(2) The results of the analyses of dusts from Colliery A cannot be compared with those of other collieries as this dust was chiefly incombustible dust due to stone-dusting.

Shallow mines are as a rule wetter than deep mines. Because of this the condition at the working face of many of the coal mines in India is not such as to be favourable to the production of dry fine coal-dust.

A different condition of things exists however on the majority of the main haulage roads. In many of the mines wet conditions at the working face gradually change to dry conditions in the main haulage roads, particularly if these are also intake airways. Moreover there is generally a greater accumulation of fine coal-dust on haulage roads than in working galleries.

17. Apart from conditions with respect to moisture however there are other important reasons why the quantity of coal-dust generally found in Indian mines is less than in mines in Great Britain. Work in Indian mines as a rule is carried on more leisurely than in the more highly organised mines of other countries. There is not the same hurry and bustle. In other countries, using highly skilled labour, mechanical coal-cutters and conveyors, and high speed haulage, the production of coal and the activities of transport are on a much more intensive scale than is usual in Indian mines. As a result in the latter within a given area and a given time less fine coal-dust is produced than under conditions in which activities are more intense.

18. It is also necessary to consider the effect of the ventilating current in drying and distributing such fine coal-dust as is produced in the mine. The drying power of the air in an Indian coal mine may be considerable. Such drying power is not the same in all mines. In shallow mines it is less than in deep mines. It is also less at some seasons of the year than at others.

Again the drying power of the air is greatest in the main intake airways because in them the air is travelling at a higher velocity and is still unsaturated. It is practically *nil* in the working places and in the main return airways. In the working places the air is as a rule almost stationary (except where there is a risk of accumulations of inflammable gas) and is approaching saturation, while in the main return airways the air is as a rule practically saturated.

For these reasons it will be found that even in mines which are naturally wet at the working face the main haulage roads, particularly if they are also intake airways, are invariably dry.

We have pointed out that the air-current is often sluggish in the working places. Because of this any fine coal-dust produced in such places is not re-distributed and kept in motion by the air-current. It may be disturbed from time to time by blasting or by the movement of tubs or workmen but soon after it settles again within the same locality. Fine dust on haulage roads where the air-current is strong is, however, being continually winnowed and re-distributed over the sides and floor of the roadway. Again a working gallery or a pillaring area in an Indian mine has, as a rule, a short life and soon ceases to be the scene of human activity,

whereas a main haulage road may have an active life extending over the whole history of the mine. Even in main haulage roads the speed of the ventilating current in an Indian mine is seldom as high as in a British mine owing to the greater thickness of the seams. In our view, therefore, the slower movement of the air-current is a factor of some importance which renders the coal-dust danger in Indian mines actually less evident than in British mines.

Recommendations of the Coal-Dust Committee already included in the Indian Coal Mines Regulations, 1926.

19. Since the publication of our First Report several recommendations made by us have been incorporated in the Indian Coal Mines Regulations, 1926. For example:—

(*a*) the recommendation that a supply of clay tamping should be provided at convenient places in the mine is embodied in Regulations 107 and 111,

(*b*) our recommendations regarding the examination of a working place for the presence of inflammable gas or dry coal-dust before the firing of a shot and the making safe of such a place before firing is covered by Regulation 115,

(*c*) our views on the use of " Permitted " explosives were met in Regulation 116,

(*d*) our comments on the particular danger resulting from narrow advance galleries in seams which give off inflammable gas have been partly given effect to in Regulation 124.

Proposed Emendations to Certain Regulations.

20. In our Second Report we refer in conclusion 3, page 7, to the desirability of " correctly proportioning " a charge of explosive. This is an important desideratum, since if the charge is too light for the work to be done it may simply blow out the tamping, and if it is too heavy much of the energy will go to produce heat and flame. It is, however, obviously impracticable to lay down any definite process of determining what is a correctly proportioned charge. Such determination must be left to the person whose duty it is to estimate the amount of the charge. On account of the nature of the work, blasting is hardly ever entrusted to inexperienced persons and any recommendation we can make cannot go beyond an injunction to bear always in mind the importance of suitably proportioning the charge to the work to be done. Proper proportioning is, however, of equal importance to proper drilling and placing, and accordingly we recommend that existing Regulation 107 be amended to read:—

" The amount of every charge of explosive shall be proportioned to the work to be done, and the charge shall be placed in a properly drilled and placed shot-hole and shall have

sufficient stemming. A sufficient supply of clay or other suitable stemming material shall be provided at places convenient to the shot-firers."

21. In our First Report we laid emphasis on the desirability of restricting the length of the narrow advance galleries which are common in pillar and stall workings in India and of conducting the ventilating current as near to the working face as is practicable. Accordingly we recommend that existing Regulation 124 be amended as follows:—

"In every mine in which inflammable gas has been found during the previous twelve months safety lamps shall be used as a precautionary measure in all galleries driven to a distance greater than the length of two pillars ahead of the last connecting gallery and in all narrow advance galleries, and no narrow advance gallery shall be driven more than 10 feet ahead of the widened gallery; in every such gallery the ventilating current shall be conducted as near to the working face as is practicable."

22. Some of the aspects of the problem outlined in our First and Second Reports were discussed at meetings of the Mining and Geological Institute of India. In particular the Council of the Institute invited opinions on the following points:—

(*a*) Whether the proposal that all dust within a comparatively small radius of a charge of explosive should be removed before the shot is fired is approved.

(*b*) Whether it is reasonable to insist on the use of 'permitted' explosives only.

(*c*) Whether the precautions applied in Great Britain are necessary in India in whole or in part.

The consensus of opinion as revealed in the discussion was that—

(*a*) it was desirable to remove coal-dust before shot-firing;

(*b*) that a general enforcement of the use of 'permitted' explosives was impracticable and unnecessary; and

(*c*) that except in perhaps a few mines in which the danger from coal-dust was more evident than in the majority such precautions as are applied in Great Britain are not necessary.

23. The general question as to the necessity or otherwise of the usual precautions against the risk of coal-dust explosions is discussed elsewhere, but we wish here to make a few comments on the practicability of cleaning up the coal-dust before shot-firing. In our Second Report it is suggested that the removal of fine coal-dust from the vicinity of a shot might eliminate the risk of an ignition by that means. On fuller consideration, however, we are inclined to the view that in general such a course would be impracticable under actual working conditions. In the ordinary process of "cleaning up" in a working place it would be only the

coarser and hence least dangerous dust which could be removed by ordinary means. The finer dust would remain and indeed would be more accessible to dust-raising agencies than if the coarser dust were not removed at all. The removal of coal-dust in the vicinity of a shot since it cannot in practice be thorough is not a complete safeguard and would have to be followed by watering or stone-dusting before the risk of an ignition of coal-dust would be effectively prevented.

Where watering or stone-dusting is to be carried out previous removal of the coal-dust as far as possible is to be recommended since less water or less stone-dust, as the case might be, would then be necessary. But where no additional palliative is to be applied it is doubtful if the removal of the dust, unless very thorough, would in itself be sufficient. The suggestion to be worth anything in practice would involve careful sweeping up of the fine dust before every shot and we greatly doubt if that is practicable. We feel that in cases where there is an obvious danger cleaning up the dust must be followed by watering or stone-dusting to be of any use, and if the danger is not a serious one, as in our opinion in general in a non-gassy mine it is not, it is perhaps better not to attempt any sweeping up of the dust before shot-firing. At the same time we approve of the removal of as much of the small coal as possible from the mine so as to minimise the amount of fine dust produced.

We wish also to draw the attention of mine managers to the possibility of fine coal-dust from screening plants being carried into the mine, and the desirability of taking steps to minimise or prevent this occurring.

General Discussion of tests included in the First and Second Reports.

24. In our Second Report we stated (1) that the dust of any coal seam of commercial value in India, if in a sufficiently fine state of sub-division and in sufficient quantity, is capable of rendering an atmosphere of ordinary air explosive. We also concluded that dust from a seam having a large percentage of ash and a low volatile content was less readily ignitable than dust from a seam low in ash and high in volatiles. For example, out of ten ignition tests of dust from the Dishergarh seam there was only one non-ignition, and of three ignition tests of dust from Sanctoria seam the non-ignitions were *nil*; while out of thirteen ignition tests of dust from No. 15 seam, Jharia, there were eight non-ignitions. Again out of five propagation tests of dusts from the Dishergarh and Sanctoria seams all resulted in inflammations, while out of six similar tests of No. 15 seam there were three failures. In our view the greater inflammability of dusts from the Dishergarh and Sanctoria seams, as compared with Jharia

(1) Conclusion 1, page 7.

No. 15 seam, is chiefly due to the larger percentages of volatile matter.

It was also shown that in order to obtain an explosion under the same conditions as with richer seams dust from No. 10 seam Jharia, for example, had to be crushed to a finer state of subdivision.

The Indian Coal Grading Board classify the coals of Bengal and Bihar and Orissa in two groups, *viz.*, low volatile coal and high volatile coal. We are of the opinion, and the view is supported by more elaborate tests in other countries, that dust from a high volatile coal under similar conditions is more inflammable than dust from a low volatile coal.

25. In considering the tests described in the First and Second Reports it must be remembered that the conditions were much more severe than are likely to obtain under normal conditions in a mine. The dust was ground artificially to a greater degree of fineness than is usually to be found in mine workings, and the source of ignition of the dust was more severe than that ordinarily obtainable from shot-firing in a mine. At the same time although the conditions were abnormal it is not impossible to obtain conditions equally severe in a coal mine, as witness the circumstances giving rise to the explosion which occurred at Parbelia Colliery in 1923. There the conditions were ideal for an ignition of coal-dust, a badly placed shot the charge from which ejected a large column of hot flame into a narrow gallery containing a large accumulation of very fine dry coal-dust.

Proposals in Respect of Coal Mines Working Seams which do not give off Inflammable Gas.

26. We have given careful consideration to the question of what safeguards, if any, are necessary against the possibility of a coal-dust explosion in mines in which inflammable gas has not been found. We have also discussed this matter with many mining engineers and colliery managers. The consensus of opinion appears to be that in such mines the risk of an explosion of coal-dust is remote and that no special safeguards are necessary.

One of the main arguments put forward has relation to the extensive use of gunpowder in these mines and the practical non-existence of any evidence of an ignition of coal-dust (1). It is argued that not only are many charges of gunpowder fired every day in these mines, but that many of them must unavoidably result in partially and occasionally completely blown-out shots, since in some mines the coal is blown from the solid face without undercut or side-cut. This argument must, we feel, be given considerable weight.

(1) The only instance of an inflammation which may have been due to coal-dust is that which occurred at Sijua Colliery and is mentioned in our First Report.

Furthermore in our view the amount of fine dust in working galleries is as a rule so meagre and so mixed with coarser particles of coal that the possibility of an inflammation in the absence of inflammable gas is remote. Consequently we do not feel justified in suggesting that any additional precautions should be taken at the coal face beyond a general recommendation that colliery managers should instruct all subordinate officials to take special care in the proportioning, placing and tamping of charges so as to avoid blown-out shots.

27. We recommend, however, that two additional regulations be made applicable to all coal mines as follows:—

> "As far as practicable main haulage roads shall be kept free from accumulations of fine coal-dust;" and
>
> "All coal tubs shall be so constructed and maintained as to prevent, as far as practicable, coal-dust escaping through the sides, ends or floor of the tubs."

The object of these regulations would be to minimise the production of fine coal-dust as far as practicable. Much fine dust, as we have pointed out elsewhere, is produced on haulage roads, and the greater the accumulations of small coal on such roads the greater the production of fine dust which may be carried by the ventilating current and by other agencies to other parts of the mine.

Proposals in Respect of Coal Mines Working Seams which give off Inflammable Gas.

28. The arguments based on the extensive use of gunpowder and the absence of any definite ignition of coal-dust though potent when applied to non-gassy mines in India are not applicable to mines in which inflammable gas is found. Other things being the same, a coal-dust explosion is much more likely to eventuate in a gassy mine than in one in which inflammable gas is absent. The presence of even a small percentage of inflammable gas in the air will greatly increase the inflammability of a dust-air mixture. Moreover an initial explosion of fire-damp provides an ideal pioneering wave which stirs up and raises any fine dust in the vicinity, and the magnitude of the flame of the gas explosion renders it probable that dry coal-dust if present will become ignited and propagate the explosion beyond the limits of the inflammable gas.

Again in India a seam which gives off inflammable gas is as a rule rich in volatiles. The evidence of coal-dust explosions even in gassy seams in India may not be so weighty as in other countries, chiefly perhaps because the number of mines working such seams in India is small compared with the number in other countries, but in our opinion it is sufficient to warrant a clear

distinction being made in our recommendations between gassy and non-gassy mines. We have the evidence of the part played by coal-dust in the explosions at Khost in 1908 and Chowrassie in 1913 and more recently at Dishergarh West Colliery in 1930. The explosion at Parbelia Colliery in 1923, while said to have been a pure coal-dust explosion, occurred in a seam which constantly gives off inflammable gas.

In our view, therefore, more stringent precautions with respect to the danger from coal-dust should be applied in gassy than in non-gassy mines.

29. Under Regulation 116 of the Indian Coal Mines Regulations, 1926, " permitted " explosives are required to be used in any mine in which inflammable gas has been found in the previous twelve months.

We recommend that additional regulations respecting the use of " permitted " explosives be made as follows:—

Suggested Regulation 116-A.—" In any place where the use of ' permitted ' explosive is enjoined by the Regulations all shots in a round of shots shall be fired simultaneously."

Suggested Regulation 116-B.—" In any place where the use of ' permitted ' explosive is enjoined by the Regulations the aggregate charge in any number of shots fired simultaneously in coal shall not exceed the permissible maximum charge for the kind of ' permitted ' explosive used."

Suggested Regulation 116-C.—" In any place where the use of ' permitted ' explosive is enjoined by the Regulations no shot shall be fired in coal which has not been undercut, overcut or sidecut, and the length of the shot-hole shall be at least 6 inches less than the length of the cut."

30. In suggesting these further precautions in respect of the use of " permitted " explosives we desire to emphasise the fact that the use of a " permitted " explosive instead of an ordinary explosive is no more than a partial safeguard. In the year 1929 eight explosions of fire-damp due to the firing of shots of " permitted " explosives occurred in Great Britain. In India the explosions at Parbelia and Dishergarh collieries were caused by the firing of shots of " permitted " explosives. It is evident, therefore, that the protection afforded by using " permitted " explosives in place of ordinary explosives is not enough to prevent an explosion of inflammable gas or coal-dust.

We invite attention to the recommendation contained in the report of the Court of Inquiry into the explosion at Dishergarh West Colliery in 1930 that shot-firers in gassy mines be required to hold a certificate of ability to test for inflammable gas. We fully endorse this suggestion and believe that it is an obvious and necessary safeguard.

31. In addition we suggest the desirability of applying the following new regulations to certain coal mines:—

"All airways, haulage and travelling roads and working places or parts of same which contain dry coal-dust shall be treated in one of the following ways:—

(*a*) they shall be treated with fine incombustible dust in such manner, and at such intervals, as will ensure that the dust on the floor, roof and sides throughout shall always consist of a mixture containing not more than 50 per cent. of combustible matter;

(*b*) they shall be treated with water in such manner, and at such intervals, as will ensure that the dust on the floor, roof and sides throughout shall be in such a wet condition that it cannot be raised in a cloud; or

(*c*) they shall be treated in such manner as the Chief Inspector of Mines may approve.

NOTE.—The incombustible dust used for the purposes of this regulation shall be prepared from shale or other material containing no injurious free silica."

These recommendations follow on the lines of regulations in use in Great Britain but are much less stringent since we have omitted the requirements regarding sampling and testing. We think that it will be sufficient to leave the proper application of the foregoing safeguards to the judgment of the mine manager and the vigilance of the officers of the Department of Mines.

32. There remain to consider the particular mines or classes of mines to which the new regulations suggested in the preceding paragraph should apply. We doubt the necessity of applying them to all coal mines in which inflammable gas is found or likely to be found, or to all mines in which safety lamps are required to be used in compliance with Coal Mines Regulation 123. In our opinion the number of coal mines in India in which there is any appreciable danger of an explosion of coal-dust is few. In South Africa and Australia—where underground conditions in coal mines are similar to those in India—precautions in respect of coal-dust are applied at the discretion of the Inspector of Mines. We consider that this example may well be followed, and we recommend that the Chief Inspector of Mines be empowered to apply the regulations detailed in the preceding paragraph to any mine in which in his opinion the risk of an explosion of coal-dust is such as to require the taking of precautions additional to those enjoined in respect of all coal mines.

GENERAL REMARKS AND CONCLUSION.

33. Before concluding our report we wish to point out that our investigations have necessarily been less elaborate than those carried out in more important coal mining countries such as Great Britain, France, Germany, and the United States of America. The

funds at our disposal were relatively small and we had to rely chiefly on investigators who could devote only a small portion of their time to the work of the Committee. As was pointed out, however, in our First Report many of the facts of cardinal importance have been adequately established in other countries and with a precision which we, with our limited resources, could not hope to emulate. We have not, therefore, considered it necessary to follow either in form or in magnitude the course of investigations elsewhere but rather to gather such data with respect to conditions in India as would enable us to arrive at an accurate appreciation of the problem as it exists in this country. We are satisfied that the information at our disposal is sufficient for the purpose for which we have been constituted and that the recommendations we have put forward are such as will provide reasonable and sufficient safeguards against the risk of explosions of coal-dust in Indian coal mines. A summary of the recommendations made is given in Appendix I.

34. In conclusion we wish to express our cordial appreciation of the valuable assistance given by owners, agents and managers of coal mines in the provision and erection of the test gallery, the supply of samples of coal, and in many other ways. The experimental work has been personally supervised by Dr. D. Penman, and in its later stages by Mr. N. Barraclough. The Committee gratefully acknowledges the valuable work done by these gentlemen on its behalf.

R. R. SIMPSON.

JAS. E. PHELPS.

H. K. NAG.

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J. THOMAS.

J. B. WARDLAW.

P. B. BASU.

JAS. H. LANG.

D. PENMAN.

APPENDIX I.

Summary of Recommendations.

1. That Regulation 107 be amended to read :—

" The amount of every charge of explosive shall be proportioned to the work to be done, and the charge shall be placed in a properly drilled and placed shot-hole and shall have sufficient stemming. A sufficient supply of clay or other suitable stemming material shall be provided at places convenient to the shot-firers."

Page 8, para. 20.

2. That Regulation 124 be amended as follows :—

" In every mine in which inflammable gas has been found during the previous twelve months safety lamps shall be used as a precautionary measure in all galleries driven to a distance greater than the length of two pillars ahead of the last connecting gallery and in all narrow advance galleries, and no narrow advance gallery shall be driven more than 10 feet ahead of the widened gallery; in every such gallery the ventilating current shall be conducted as near to the working face as is practicable."

Page 9, para. 21.

3. That two additional regulations be made applicable to all mines as follows :—

" As far as practicable main haulage roads shall be kept free from accumulations of fine coal-dust; and

" All coal tubs shall be so constructed and maintained as to prevent, as far as practicable, coal-dust escaping through the sides, ends or floor of the tubs."

Page 12, para. 27.

4. That additional regulations respecting the use of " permitted " explosives be made as follows :—

Regulation 116-A.—" In any place where the use of ' permitted ' explosive is enjoined by the Regulations all shots in a round of shots shall be fired simultaneously."

Regulation 116-B.—" In any place where the use of ' permitted ' explosive is enjoined by the Regulations the aggregate charge in any number of shots fired simultaneously in coal shall not exceed the permissible maximum charge for the kind of ' permitted ' explosive used."

Regulation 116-C.—" In any place where the use of ' permitted ' explosive is enjoined by the Regulations no shot shall be fired in coal which has not been undercut, overcut, or sidecut, and the length of the shot-hole shall be at least 6 inches less than the length of the cut."

Page 13, para. 29.

5. That shot-firers in gassy mines be required to hold a certificate of ability to test for inflammable gas.

Page 13, para. 30.

5. That to certain coal mines a new regulation, as follows, be applied :—

"All airways, haulage and travelling roads and working places or parts of same which contain dry coal-dust shall be treated in one of the following ways :—

(*a*) they shall be treated with fine incombustible dust in such manner, and at such intervals, as will ensure that the dust on the floor, roof and sides throughout shall always consist of a mixture containing not more than 50 per cent. of combustible matter;

(*b*) they shall be treated with water in such manner, and at such intervals, as will ensure that dust on the floor, roof and sides throughout shall be in such a wet condition that it cannot be raised in a cloud; or

(*c*) they shall be treated in such manner as the Chief Inspector of Mines may approve.

NOTE.—The incombustible dust used for the purposes of this regulation shall be prepared from shale or other material containing no injurious free silica."

Page 14, para. 32.

7. That the Chief Inspector of Mines be empowered to apply the regulation detailed in the preceding paragraph to any mine in which in his opinion the risk of an explosion of coal-dust is such as to require the taking of precautions additional to those enjoined in respect of all coal mines.

Page 14, para. 32.

APPENDIX II.

Demonstration Tests.

Tests Nos. 74, 75, 76.—These tests were carried out at the experimental underground gallery at Godhur on the 27th January 1928 (see Second Report, page 11). The condition of the floor of the gallery was damp due to running rain water.

Test No. 74.—The testing gun was placed at a distance of 150 feet from the mouth of the incline and charged with three-quarters of a pound of English compressed gunpowder. The floor of the gallery was strewn with dust from No. 13 seam, Jharia, 80 per cent. of which was ground to pass a sieve of 150 meshes per linear inch.

Result.—No ignition.

Test No. 75.—Repeat of No. 74 but with the gun brought up to a dry place at 35 feet from the mouth of the incline. A small amount of fresh dust was placed on the floor near the mouth of the cannon.

Result.—An ignition, large volumes of flame being ejected from the mouth of the incline.

Test No. 76.—Repeat of test No. 75.

Result.—An ignition similar to that in test No. 75.

Tests Nos. 77, 78, 79.—These tests constituted a demonstration of the inflammability of Indian coals to members of the Colliery Managers' Association in India and were carried out, in the steel test gallery at the Indian School of Mines, Dhanbad, on the 9th July 1928.

Test No. 77.—Seam No. 13, Jharia. Fineness of dust 75 per cent. passed through 200 mesh sieve. Source of ignition—Three-quarters of a pound of English compressed gunpowder fired from the test cannon. Dust strewn on floor of test gallery for a distance of about 25 feet.

Result.—Ignition with large volume of flame emerging from mouth of tube.

Test No. 78.—Repeat of No. 77 but without spreading any more coal-dust.

Result.—Ignition as in test No. 77.

Test No. 79.—Repeat of Nos. 77 and 78, but with dust which was six months old.

Result.—Ignition as in tests Nos. 77 and 78.

APPENDIX III.

Tests in an underground gallery with sweepings collected from working galleries and haulage roads.

Date:—21st February 1931.

In the majority of previous tests artificially ground fine coal-dust was used and the tests were made under conditions which were very favourable to an explosion or ignition being obtained. The following tests were made with dust in, as far as possible, the same state of sub-division as it was found in the mine.

The tests were conducted in an underground incline in 15 seam which was prepared and placed at the disposal of the Coal-Dust Committee by the kindness of the East Indian Coal Company, Limited, the owners of Kendwadih Colliery. The dimensions of the incline are shown in Figure 1.

Tests Nos. 80, 81 and 82.—Dust used.—A dry hand-cut gallery in 15 seam was swept clean for a distance of about 15 feet from the face and the whole of the material collected, with the exception of pieces of coal exceeding a 1-inch cube, was placed in kerosene tins. From a volume of 973 cubic feet of gallery and a floor area of 122 square feet, a quantity of 375 lb. of dust and small coal was obtained.

At the experimental incline the material was evenly spread on the floor over an area such that the volume of the gallery was the same as the volume of the gallery from which the sample was obtained.

Test No. 80.—Two shot-holes about 4 feet deep were drilled in the coal side of the experimental incline and lined with iron pipes having an internal diameter of about 2 inches. The holes were 18 inches above the floor and inclined so that they pointed towards a point on the floor in the centre of the gallery.

The object in lining the holes was to produce blown-out shots and to prevent the sides of the incline being unduly shattered. The holes were charged each with 1 lb. of country-made gunpowder and stemmed with 2 inches of clay.

The shots were fired electrically, the second shot being fired about 1 second after the first.

Result.—The first shot raised a cloud of dust but no flame other than the flame from the explosive was observed. The second shot did not cause an ignition of the dust cloud.

Test No. 81.—This test was a repetition of No. 80 as described above, but the first shot was a charge of 2 lb. and the second 1½ lb. of country-made gunpowder. An interval of about 10 seconds elapsed between the firing of the two shots.

Result.—The first shot raised a cloud of coal-dust but no flame other than the flame of the shots was observed.

Test No. 82.—The conditions were the same as in tests Nos. 80 and 81, but the charges were 6 oz. of gelignite and the interval between the firing of the two shots was about 2 seconds.

Result.—The dust cloud formed by the first shot appeared to be smaller than the clouds produced by the charges of gunpowder in the previous tests. One cartridge of gelignite was projected from the second shot-hole and continued to burn on the floor of the gallery until it was consumed. No ignition took place

Sieve analysis of a representative sample of the dust used in tests Nos. 80, 81 and 82.

Total weight of sample.	Remained on 30 mesh sieve.	Remained on 90 mesh sieve.	Remained on 150 mesh sieve.	Remained on 200 mesh sieve.	Passed through 200 mesh sieve.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
3 lb. 9·05 oz. .	77·7	13·8	4·7	2·1	1·7

Proximate analysis of coal-dust used in tests Nos. 80, 81 and 82.

Ash.	Moisture.	Volatile matter.	Fixed carbon.
18·35	2·51	27·20	51·94

It is interesting to note that in the experimental incline the concentration of dust which was capable of being passed through a 150 mesh I.M.M. Sieve was ·228 oz. per cubic foot of air space; a concentration in excess of that required for an explosion.

The fine dust, however, was mixed with 25 times its own weight of coarser dust, which would, to a considerable extent, prevent it being raised in a cloud by the blown-out shots.

Tests in an underground gallery with sweepings collected from a machine-cut gallery.

Date:—26th February 1931.

Dust used.—The mixture of small coal and dust was taken from a gallery in 15 seam which was being driven along a barrier to prepare a pillar for extraction. The gallery being to the rise of an area in which pillars were being extracted was perfectly dry. The face had been undercut by a coal-cutting machine and the normal amount of sweeping and cleaning up had been done preparatory to blasting the face. Although the gallery looked clean there was still a fair amount of the finer dust left on the floor. There was practically no dust on the sides. From a volume of 2,182 cubic feet of gallery and a floor area of 336 square feet, 375 lb. of dust and small coal were obtained.

At the experimental incline the material was evenly spread on the floor over an area such that the volume of the gallery was the same as the volume of the gallery in the mine from which it was obtained.

Test No. 83.—Two shot-holes drilled in the coal side of the experimental incline and lined with iron pipes, 2 inches in diameter and 4 feet long, were each charged with 1 lb. of country-made gunpowder and tamped with about 1½ inches of clay. The first hole was 1 foot above the floor and inclined so that it pointed towards a point on the floor in the centre of the gallery and the second hole was almost horizontal and 3 feet above the first hole. The first hole was fired by ordinary fuse, and the second was fired by electric fuse 1 second after the first shot exploded.

Result.—The first shot raised a cloud of dust and there was a slight ignition of the coal-dust with a flame which appeared to be about 4 feet in diameter and to extend for a distance of 4 or 5 feet across the gallery. There was no ignition with the second shot. The noise made by both shots indicated

that in the absence of the lining pipes they would have done a normal amount of work. The pipes were not damaged and both shots were blown-out shots.

Test No. 84.—This test was a repetition of test No. 83 as described above, but both holes were charged with 2 lb. of country-made gunpowder.

Result.—The first shot raised a cloud of dust but neither of the shots produced an ignition of coal-dust. Although the shots were " blown-out shots " the lining pipes were torn longitudinally and the coal at the face of the holes was shattered.

Test No. 85.—Three, two ounce, cartridges of gelignite were tied together and laid on the dust, as it was spread over the floor for the previous tests, and fired by a fuse detonator.

Result.—A loud detonation with a small bright flame but no ignition. The dust cloud raised by this means was barely perceptible.

Test No. 86.—About 50 lb. of unsieved material was placed on the floor in a pile about 15 inches in diameter and three catridges of gelignite, arranged as in the previous test, were buried in the dust to a depth of two or three inches.

Result.—There was a loud detonation but no more flame than in Test No. 85, and although a large concentrated cloud of dust was formed no ignition took place. The dust from a radius of 18 inches was blown off the floor.

Test No. 87.—One shot-hole 4 feet deep and lined with an iron pipe, 2 inches in diameter, placed 12 inches above the floor and inclined so that it pointed towards the floor was charged with 2 lb. of country-made gunpowder and stemmed with 1½ inches of clay.

Result.—A " blown-out " shot accompanied by a loud detonation. There was an ignition of coal-dust; the flame being observed very distinctly. It traversed the floor, the opposite side and the roof and appeared to die out on the side in which the shot-hole was placed. The flame seemed to be more intense round the perimeter of the gallery than in the centre. The ignition did not appear to extend outwards although there was dust on the floor for a distance of 20 feet from the shot-hole towards the incline entrance. It seemed to be confined to a section of the gallery, 5 to 10 feet long, in which the concussion and the velocity of the products from the blown-out shot raised a cloud of dust.

The fact that an ignition of this extent was obtained when previous shots of similar charge had not resulted in such an ignition is explained by the fact that the fine dust of the dust clouds raised in previous experiments had been deposited on the floor roof and sides and thus a condition favourable for an ignition was gradually created.

The results so far obtained indicate that where fine dust, which is free to be raised in a cloud, is present in a gallery a blown-out shot can raise and ignite a dust cloud of considerable volume but if the fine dust is intermixed with many times its own volume of coarser dust a blown-out shot is unlikely to raise and ignite a dust cloud of such a concentration and volume as might initiate a coal-dust explosion.

Sieve analysis of a representative sample of the dust used in tests Nos. 83—87.

Total weight of sample.	Remained on 30 mesh I. M. M. sieve.	Remained on 90 mesh I. M. M. sieve.	Remained on 150 mesh sieve.	Remained on 200 mesh I. M. M. sieve.	Passed through 200 mesh I. M. M. sieve.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
4 lb. 12·25 oz.	67·5	17·4	8·4	4·1	2·6

Proximate analysis.

Ash.	Moisture.	Volatile matter.	Fixed carbon.
19·67	2·20	27·64	51·49

In the experimental incline and in the machine-cut gallery from which the dust was obtained the concentration of dust capable of being passed through a 150 mesh sieve was ·184 oz. per cubic foot of air space; a concentration capable of propagating an explosion. It will be noted that the percentage of dust which passed through a 150 mesh sieve was 6·7 per cent. whereas the percentage of dust of the same fineness obtained from a hand-cut gallery (see tests 80—82) was 3·8 per cent. The hand-cut gallery had not been cleaned up before the sample was collected.

By sweeping a gallery with a wisp or coarse broom as was done in the machine-cut gallery before the sample was taken the fine dust is concentrated on the floor.

Tests in an underground gallery with sweepings collected from a haulage road.

Date:—1st March 1931.

Dust used.—The sample consisted of unsieved small coal and dust collected from the floor and sides of a dry section of haulage road in No. 15 seam. The floor could not be swept clean as there was a considerable thickness of small coal which formed the packing of the haulage line and from the floor a superficial layer, not more than ¼ inch thick, was included in the sample. From a volume of 2,340 cubic feet of roadway and a floor area of 234 square feet, 375 lb. of dust and slack coal were obtained.

At the experimental incline the material was evenly spread on the floor over an area such that the volume of the gallery was equal to the volume of the roadway in the mine from which it was collected.

Test No. 88.—Two shot-holes in opposite sides and about 12 inches above the floor of the gallery were made 4 feet deep and lined with strong iron pipes, 2 inches in diameter. The outer end of the holes pointed towards the floor. Each hole was charged with 1 lb. of country-made gunpowder, the first shot being primed with ordinary fuse and the second with an electric fuse.

Result.—The first shot was a " blown-out shot " and raised some dust but no ignition of the dust cloud occurred. It was the intention to fire the second shot one second after the first but it misfired due to a defective electric fuse.

Test No. 89.—Test No. 88 was repeated but two holes were each charged with 2 lb. of country-made gunpowder.

Result.—The first shot, which was ignited by an ordinary fuse, resulted in a loud detonation and was a " blown-out shot ". Although a dust cloud was formed and there was considerable flame with the blown-out shot, there was no ignition of the coal-dust. Despite the fact that two electric fuses were used the second shot was a misfire.

Test No. 90.—One hole, 12 inches above and pointing towards the floor, was charged with 2 lb. of country-made gunpowder and fired by means of ordinary fuse. In order to encourage the formation of a more concentrated dust cloud and create conditions more favourable for an ignition, additional dust was spread on the floor in the line of the shot-hole.

Result.—No ignition. This shot was not a blown-out shot as the lining pipe was destroyed and about 1 ton of coal was blown off the side of the gallery.

Sieve analysis of a representative sample of the dust used in test Nos. 88, 89 and 90.

Total weight of sample.	Remained on 30 mesh I. M. M. sieve.	Remained on 90 mesh I. M. M. sieve.	Remained on 150 mesh I. M. M. sieve.	Remained on 200 mesh I. M. M. sieve.	Passed through 200 mesh I. M. M. sieve.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
4 lb. 8·8 oz. .	73·2	12·8	7·5	4·0	2·5

Proximate analysis.

Ash.	Moisture.	Volatile matter.	Fixed carbon.
17·68	2·98	26·86	52·48

Tests in an underground gallery with sweepings collected from a gallery in the Dishergarh seam.

Date:—7th March 1931.

Dust used.—The unsieved dust used in these tests was obtained from a mine in the Raniganj coalfield and from a district in the Dishergarh seam which was being extended towards the rise. The thickness of strata above the seam was about 850 feet. As the dust at working faces was damp and unsuitable for the purposes of the tests the sample was taken from a dry travelling and carrying road situated about 100 feet from the nearest working face. The faces were being cut by hand, and coal-cutting machines had not been used in the district. The quantity of dust on the sides of the gallery was negligible and the whole of the sample, weighing about 390 lb. was obtained by sweeping the floor. In order to avoid loss of fine dust during transit the sample was transported from the mine to the experimental incline in sealed tins.

At the experimental mine the material was evenly spread on the floor over an area such that the volume of the gallery was about half that of the gallery from which it was obtained.

Sieve analysis of the dust used in tests Nos. 91—95.

Total weight of sample.	Remained on 30 mesh I. M. M. sieve.	Remained on 90 mesh I. M. M. sieve.	Remained on 150 mesh I. M. M. sieve.	Remained on 200 mesh I. M. M. sieve.	Passed through 200 mesh I. M. M. sieve.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
5 lb. 7·35 oz. .	83 9	8·5	2·6	2·3	2·7

Proximate analysis.

Ash.	Moisture.	Volatile matter.	Fixed carbon.
10·10	3·14	35·02	51·74

In the unsieved dust used in the tests the quantity of dust capable of being passed through a 150 mesh sieve was 312 oz. and in the experimental incline the concentration of dust of this fineness was 0·17 oz. per c. ft. of air space.

Test No. 91.—Two shot-holes made in the coal side of the experimental incline and lined with iron pipes, 4 feet long and 2 inches in diameter, were each charged with 1 lb. of country-made gunpowder and tamped with about 1½ inches of clay. The shot-holes were about 12 inches above the floor and 4 feet apart and arranged so that the gaseous products from the shots would strike the floor at about the centre of the gallery. The first shot was ignited by means of ordinary fuse and the second was fired about one second later by an electric fuse.

Result.—The shots which were " blown-out shots " disturbed and dispersed some of the coal-dust in the vicinity of the shot-holes but the cloud of coal-dust which was formed was not ignited.

Test No. 92.—After some fresh dust had been strewn in front of the shot-holes to replace the dust dispersed by the previous shots the holes were each charged with 2 lb. of country-made gunpowder and fired in the same manner as described in test No. 91.

Result.—The charge of the first shot burnt without exploding and gave a large flame for several seconds. The second shot was fired about one second after the flame of the first shot was first observed and it resulted in a loud detonation and a blown-out shot. There was no ignition of coal dust.

Test No. 93.—One shot-hole at the opposite side of the incline to the holes used in tests Nos. 91 and 92 and about 6 feet closer to the incline entrance, was charged with 1½ lb. of country-made gunpowder. The hole was 12 inches above and pointing towards the floor. The fine dust separated from the coarser particles by the previous tests had been deposited as a thin film on the floor and sides and it was thought that an ignition might be obtained.

Result.—A blown-out shot but no ignition of coal-dust occurred.

Test No. 94.—One shot-hole 12 inches above the floor was charged with 8 oz. of Monobel (Permitted explosive).

Result.—A blown-out shot and the lining pipe was ejected from the hole. No ignition took place and no flame was observed.

Test No. 95.—Another hole 12 inches above the floor was charged with 10 oz. of Monobel and tamped with about one inch of clay.

Result.—A blown-out shot and the lining pipe was shattered and blown out of the hole. The detonation was sharp and a flame 9 to 12 inches long was observed. There was no ignition of coal dust.

APPENDIX IV.

Ignition tests in an underground gallery with screened coal-dust of various sizes.

Date:—8th March 1931.

Dust used.—The dust used in the following tests was obtained from a machine-cut gallery in 15 seam which had been cleaned up preparatory to blasting. It was screened through 30,90,150 and 200 mesh I.M.M. standard sieves. Great care was taken in screening the dust to avoid, as far as possible, any of the finer dust remaining with that of a coarser mesh. At the experimental incline the dust of each size was tested separately. As the quantity of dust available was limited it was strewn on iron plates laid on the floor in front of a shot-hole. The shot-hole used throughout the tests was 12 inches above the floor and directed towards a point in the centre of the iron plates, and in each test it was charged with 1 lb. of country-made gunpowder, lightly tamped with 1½ inches of clay and fired by means of an electric fuse.

Table showing conditions and results of tests.

Number of test.	Size of dust used.	Quantity of dust used.	Approximate length of gallery dusted.	Concentration of dust per c. ft. of air space.	Result.
		oz.	ft.	oz.	
96	Through 30 mesh and on 90 mesh.	100	5	·35	No ignition.
97	Through 90 mesh and on 150 mesh.	43·8	4	·19	Do.
98	Through 150 mesh and on 200 mesh.	17·5	3	·17	An ignition.
	Through 200 mesh	11·2			

After tests Nos. 96 and 97 it was observed that the dust had been blown off the iron plates for a width of 2 to 3 feet. As Dr. Penman thought that the failure to obtain ignitions in tests Nos. 96 and 97 might have been due to the dust being blown off the smooth iron plates in advance of the flame of the blown-out shots, several lumps of coal were placed on the plates before spreading the dust from test No. 98 so that there would be greater turbulence in the dust cloud. In test No. 98, when an ignition was obtained the flame appeared to traverse the floor, opposite side and the roof of the gallery, and it was of about the same volume and intensity as the flame observed in test No. 87. After the test particles of coked dust were found on the iron plates.

APPENDIX V.

Note on the visit of the Coal-dust Committee to a colliery in the Raniganj Coalfield on the 15th December 1930.

Colliery A.

The party descended by the upcast shaft which is about 1,500 feet deep. Hygrometric readings taken in a main return airway near to the shaft bottom were, wet bulb 76° F., dry bulb 89° F. The south-east section of the mine was inspected and the workings were found to be very dry. The mine makes very little water and no pumping is necessary.

The general impression obtained from the underground inspection was that the workings were adequately stone dusted, and that the percentage of incombustible matter in the dust was higher than fifty. In the return airways the stone-dust on the floor was of a considerable thickness and when it was disturbed it readily rose in a cloud.

Stone dusting was not done close to the working faces, but as the faces were well ventilated and no shots were being fired in them there appeared to be no danger in leaving a short length of gallery without stone-dust. We were informed that "permitted" explosives were used in certain places on the broad side of pillars and that when a shot was about to be fired the immediate area was drenched with water instead of being stone dusted.

Stone-dust which was prepared from red burnt shale and occasionally from a buff coloured river silt was ground in a steel ball mill. The cost of grinding and spreading the stone-dust, and of cleaning the roads, prior to spreading the stone-dust was stated to be Pies 9·4 per ton of coal raised, and in 1930, when the output was 143,688 tons, 1,466 tubs of stone-dust were sent into the mine.

Note on the visit of the Coal-dust Committee to a colliery in the Raniganj Coalfield on the 29th December 1930.

Colliery B.

Descent was made by No. 1 (upcast) pit, 1,175 feet deep to the Dishergarh seam, 13 feet thick. Along the main east level the haulage road was fairly dry and caked underfoot. On the No. 1 S. E. haulage road it was dry and dusty for about 600 feet and there was a quantity of caked and loose dust on the sides of the pillars. The tram lines here and elsewhere are ballasted with boiler ash (some 15 tubs of ashes are lowered daily). On No. 9 east level there was a certain amount of moisture on the floor and not much dust, but the face, where pillar extraction has been commenced, was dry and there was a fair quantity of slack and dust. The goaved parts, however, contained no slack. We were informed that all coal, even slack and dust, is valuable and that it pays to remove it.

No. 13 level was distinctly damp and this condition obtained throughout the whole of the workings near No. 1 east haulage dip. On No. 18 level between No. 1 east haulage dip and No. 1 west haulage dip it was dry and dusty, but less so near the No. 1 west haulage dip and on the dip itself it was damp. The main dip workings were fairly wet throughout the parts seen, but at certain points conditions were dry within 100 feet of the face. The No. 1 west haulage road was dry in places, and there was not much dust.

In the main west return airway for a stretch of 110 feet near the upcast shaft the conditions were dry and dusty. This was the only part of the return airway examined.

About 8,000 gallons per hour is pumped and this water is given off from one end of the working faces to the other.

900 lb. of stonobel and 3,000 detonators are used in an average month for an output of 14,000 tons. 75 per cent. of this is got by electric coal cutters.

The ventilation was good. The last measurement made on 15th December 1930 was 111,000 cubic feet per minute. The fan was not working at the time and it is not used during the cold weather months.

Note on the visit of the Coal-dust Committee to a colliery in the Raniganj Coalfield on the 29th December 1930.

Colliery C.

Descent was made by the downcast shaft No. 2—980 feet deep to the bottom seam (Poniati) 16 feet thick. We went along south main haulage road. This was firm underfoot and free from slack and dust. We went down No. 5 west haulage dip which was damp throughout and towards the lower end water was dropping from the roof. The south machine galleries were wet throughout. Travelled north to No. 1 west dip haulage depillaring district passing C. P. driven galleries on the way. The whole of this was fairly dry. We returned by No. 4 west and main north all of which were moist. The main haulage roads are all packed with boiler ashes—some twelve tubs per day being used for the purpose.

About one-third of the output is got from machine galleries from an output of 20,000 tons per month. The percentage of slack is about 30 per cent. (below 1½″). Forty per cent. of the slack passes through ½″ mesh. The ash packing is not done as a precaution against the danger from coal dust.

12,000 lb. of country gunpowder is used per month. Gelignite is used only for driving through dykes.

A Turbon fan produced 100,000 cubic feet of air per minute.

The depillaring areas were dry but all new drivings were wet.

Gunpower is fired in tin tubes on account of the wetness of the holes About 250 of these are used per day. They are only used in virgin ground.

14,000 gallons of water are pumped per hour.

Meeting of the Coal-dust Committee at a colliery in the Jharia Coalfield on Monday, 5th January 1931.

Colliery D.

The party descended by No. 11 shaft, 350 feet deep, to No. 13 seam.

On the main dip haulage the conditions were dry, there being dust along the sides near the floor, but the upper half of the sides and the roof were free of accumulations of dust. On No. 3 east level the conditions were similar to those on the haulage road until a dyke was reached when conditions were damp. In the top east pillaring section the conditions were damp and water was dropping from the roof in the goaf. It was stated that the conditions generally were moist in de-pillaring areas.

We also visited parts in which machines were being used to split pillars. In these galleries the conditions were dry. All coal is loaded out as run-of-mine coal—no slack being left behind. The lower part of the main dip haulage was similar to the upper part and at No. 5 pit bottom the conditions were dry and very dusty. This was due to the fine dust given off from the coal in the rotary tippler.

The drift into No. 12 seam was wet. In No. 12 seam we visited several machine-cut galleries. The conditions there were dry.

The workings in No. 12 seam are in general, however, damper than those in No. 13 seam.

We asked if it was considered that the conditions at the bottom of No. 5 shaft constituted a danger and were told that as there was no shot-firing within a quarter of a mile of No. 5 shaft bottom no danger was anticipated. It was stated that the dust was cleaned up daily and that if it was thought to be a danger a simple plan would be to instal water sprays on both sides of the tippler.

Additional information:—

(1) Water pumped from the colliery—1,500 gallons per minute.

(2) Ventilation:—One fan exhausting 200,000 cubic feet per minute and one exhausting 125,000 cubic feet per minute, each dealing with different districts.

(In general we found the ventilation good.)

(3) Country gunpowder is used—
10,000lb. are used per month.

(4) Output—27,000 tons per month.

(5) All coal is machine-cut.

(6) Depth of shafts, No. 11—350 feet, No. 5 shaft—650 feet.

(7) The seam does not give off gas.

Mr. Barraclough was asked to take samples at the following places:—

(*a*) Top of main haulage dip.

(*b*) In a gallery off No. 3 level.

(*c*) In a gallery in No. 13 seam.

(*d*) On the level near the rotary dump.

Each sample at any place to be taken in 3 parts:—

(i) Floor, (ii) sides together, and (iii) roof.

Samples to be analysed for fineness, moisture and incombustibles.

Meeting of the Coal-dust Committee at a colliery in the Jharia Coalfield on Monday, 5th January 1931.

Colliery E.

The route taken was as follows:—Descended No. 1 pit, then went by north level and up north-east jig for about 600 feet. The level was clear of dust, firm under foot and damp. The jig was in a somewhat similar condition but got drier farther up.

We then came down the jig, and went down north side main dip about 200 feet turning off to north machine section. This district is dry throughout. The working galleries were well cleaned up, indeed they were swept up. They were, therefore, as clear of dust as is practicable. (The galleries are swept after every machine cut). The tram lines in the levels in this district were packed with stone and coal slack. It was said that this was common practice throughout the mine and throughout the coal-field. We then returned to the north side main dip and went down it for 400 feet. This dip was dry and dusty.

From the dip we passed through a stone drift into No. 14-A seam, traversing a part of the workings of that seam and emerging on south side main dip into No. 15 seam. The workings of No. 14-A seam were also dry and dusty but the dust appeared to be coarser than the dust in the district visited in No. 15 seam. We now came up south side main dip which was dry for half its length, the remaining portion being damp.

A visit was paid to the south side main return, in which there was a film of dry fine dust over the sides, and the floor was also dry and dusty. We were told that this was the accumulation of a quarter of a century.

Additional information was supplied as follows:—

(1) No blasting is done in No. 14-A seam.

(2) Practically all galleries in No. 15 seam are machine-cut, and are blasted by means of country gunpowder. Shot holes are drilled by compressed-air percussion drills.

(3) Country gunpowder used per month 2,100 lb.

(4) Output for this expenditure of gunpowder—4,500 tons.

(5) The depth of the shaft—400 feet.

(6) Composition of seams:—

No. 15 seam—	
Ash	11·00
Moisture	1·98
Volatile matter	22·00
Fixed carbon	65·02
No. 14-A seam—	
Ash	8·60
Moisture	1·67
Volatile matter	23·40
Fixed carbon	66·33

(7) Quantity of air in circulation—67,000 cubic feet per minute for No. 1 pit, and No. 2 pit 40,000 cubic feet per minute. The ventilation is natural.

(8) The seam does not give off fire-damp.

(9) The reason for not using machines and not blasting in No. 14-A seam is not because of any apprehension of a danger from coal-dust.

Samples to be taken as follows:—

(1) North side main dip.

(2) A gallery in north side machine section No. 15 seam.

(3) A gallery in No. 14-A seam.

(4) South side main dip.

Meeting of the Coal-dust Committee at a colliery in the Jharia Coalfield on Monday, 19th January 1931.

Colliery F.

Depth to 18 seam—430 feet. Thickness of seam—11 feet. The seam dips from the shaft at varying gradients. Present greatest depth of workings 750 feet.

Route.—Descended No. 1 pit, traversed shaft level for a distance of about 250 feet, then down the cross-cut dip and along east level where several galleries were inspected.

Conditions.—Comparatively free from dust and damp throughout and wet at many places, particularly at the working machine faces.

We then returned to cross-cut dip and went down it for a distance of about 1,000 feet. Conditions on the dip—comparatively free from dust and fairly damp.

From the dip we went along the level on the rise side of No. 3 panel area. Conditions were similar to those on the dip.

We then went to the pillar extraction area through the dyke. In this area there was dry slack lying on the floor.

We then came along the level to the main haulage dip and up to No. 1 shaft level again.

Ventilation.—A fan is provided which gives 140,000 cubic feet per minute. In the cold weather the fan does not run and the quantity got by natural ventilation is over 90,000 cubic feet per minute. The seam gives off gas in most new galleries but particularly rise galleries. In through galleries and in depillaring areas no gas is given off.

	Per cent.
Analysis of seam—	
Volatiles	29·76
Fixed carbon	58·40
Ash	11·84
Moisture	1·14

Explosives used—

Permitted—Monobel.

Maximum quantity per day—51 lb.

Maximum number of shots fired per day—105 shots.

Output per month—10,000 tons, 90 per cent. of which is from machines.

Quantity of water pumped per hour—13,500 gallons. Water is fairly generally distributed over the workings.

Mr. Barraclough was asked to take a sample in the pillaring area, the conditions in respect of coal-dust there although not bad and not representative of the mine were the worst seen by the members.

APPENDIX VI.

Note regarding samples of Dust collected at mines in the Raniganj and Jharia Coalfields.

Method of collecting samples.—In order to ascertain if the quantity of dust present was sufficient to propagate an explosion, a transverse section of the roadway or gallery, one foot wide, was swept.

Near working faces where there were no tram lines and no great thickness of materials, the floor was swept clean, but on haulage roads where the materials on the floor were of an appreciable thickness this was not possible and a superficial layer not more than half an inch deep was removed. The intention was to include in the sample only such dust as would be likely to be raised in a cloud by an explosion. This procedure was followed throughout so that from the results it is possible to compare the conditions obtaining at the various mines. From each sample about an ounce of the dust was placed in an air-tight bottle for the purpose of analysis.

The samples collected on haulage roads were taken at points where the conditions of dryness and dustiness were fairly representative of the general condition of the whole roadway.

Concentration of coal dust necessary for the propagation of an explosion.—In paper No. 31, Safety in Mines Research Board, it is stated that Allison (an American investigator) found from experiments conducted in a small experimental gallery, 17 feet long and 8 inches in diameter, that the definite lower limit of inflammability of Pittsburgh coal dust was ·034 oz. per cubic feet of air space. With concentrations above the lower limit of inflammability the flame length increased to a maximum with a dust density of ·5 oz. per cubic feet of air. In dust clouds of higher concentrations the lengthening of the flame was less than in clouds of the optimum concentration. The dust used in the experiments was passed through a 20 mesh sieve (Tyler standard—about 15 mesh I. M. M.).

Extract from a paper "The testing of mine dusts" by Godbert and Wheeler read before the Midland Institute of Mining Engineers on 16th January 1931.

The limits of concentration.—"The lower limit is usually well defined and can be determined experimentally, but the upper limit, since it implies the continued maintenance of a dense cloud in the air, is probably indeterminate and has but little practical significance. For the lower limit between 0·075 and 0·10 oz. per cubic feet of air has been found for fine dusts (85 per cent. through 200 mesh sieve). For each coal-dust there is an optimum concentration at which its inert-dust limit (which is a measure of its inflammability) is greatest. In the Safety in Mines Research Board's tests the optimum concentration has ranged between 0·11 and 0·60 oz. per cubic feet of air, being between 0·18 and 0·38 oz. for the majority of the dusts tested."

Extract from Bulletin 167, Bureau of Mines.

Effect of fineness of dust.—"An extensive series of tests was made to determine the effect of the fineness of coal-dust on its explosibility. It was found that particles coarser than 20 mesh (Tyler standard, nearly equivalent to 15 mesh I. M. M. Standard) has little effect in influencing the development of an explosion of Pittsburgh coal-dust. The pressures developed and the velocity of the explosion increased as the percentage of fine sizes increased; moreover, the percentage of shale-dust necessary to prevent propagation increased with the percentage of fine sizes. An increase from 50 per cent. to 80 per cent. of shale-dust was necessary to prevent propagation when the percentage of 200 mesh (Tyler standard—about 160 I. M. M. Standard) was increased from 10 per cent. to 80 per cent. of the coal-dust through a 20 mesh screen."

The fineness of a coal-dust is of paramount importance as it determines (*a*) the ease with which a dust cloud can be formed, (*b*) the rate of reaction between oxygen of the air and the combustible particles, and (*c*) the rate at which heat can be absorbed by the particles. Tests in India have proved that a charge of 1¼ lb. of country-made gunpowder tamped with clay and fired in a steel cannon is capable of causing an explosion of coal-dust 50 per cent. of which had passed through a 150 mesh I. M. M. sieve. Recent tests, however, have indicated that when fine coal-dust is mixed with many times its own volume of coarser dust a blown out shot of even 2 lb. of country-made gunpowder is unlikely to cause an explosion.

A more severe source of ignition such as an explosion of inflammable gas would be likely to raise the fine dust in a cloud even if the fine dust were intermixed with many times its own volume of coarser dust.

Conclusions to be drawn from the analyses of dust samples collected in the Raniganj coalfield.

Colliery C.—Of the samples collected at this colliery only sample No. 3 can be considered to indicate a dangerous condition. This sample had a low moisture and ash content and it contained sufficient fine dust to render it capable of propagating a coal-dust explosion. The fine dust, however, was mixed with nearly four times its own weight of coarser dust which would militate against the formation of a dust cloud. The seam does not normally give off inflammable gas and open lights are in use throughout the mine. Two of the samples collected on haulage roads contained insufficient fine dust to support an explosion and the third had a moisture and ash content exceeding 50 per cent.

Colliery B.—Of the samples collected at this mine samples Nos. 6, 7 and 9 indicated that there was sufficient fine dust present to support an explosion. The seam gives off inflammable gas and the use of safety lamps is necessary throughout the mine. In the event of a firedamp explosion the fine coal-dust in the quantity found in samples Nos. 6 and 7, which were collected from the vicinity of working faces, would have constituted an additional danger as it would, in all probability, have propagated an explosion over a more extensive area. The majority of the working faces in this mine were wet but a number of galleries in the area from which samples Nos. 6 and 7 were taken were approaching to dryness. These galleries had lagged behind the faces on the flanks with the result that the water normally present in the seam had been drained by the more advanced galleries.

Colliery A.—With the exception of sample No. 13 all the samples collected at this mine contained more than 70 per cent. of moisture and incombustible matter. All the workings are stone dusted to within a short distance of the working faces. Sample No. 13 was collected 15 feet from the face of a hand-cut gallery where stone-dust had not been applied but a small amount of inert-dust had been deposited by the ventilation. From this sample it will be noted that there was sufficient fine dust present to support an explosion and that 28·6 per cent. of the dust passed through a 30 mesh sieve (I. M. M. Standard).

(Sd.) N. BARRACLOUGH,
Inspector of Mines.

TABLE

Result of Sieve tests and analyses of dust collected

Serial No.		Place from which sample was taken.	Name or number of seam.	Area of roadway sq. ft.
1	Colliery C. . .	No. 4 West Dip Haulage near top level into W. Panel. Intake airway.	Poniati . .	104
2	Do. . .	No. 1 West Dip Haulage near bottom level into W. Panel. Intake airway.	Do. . .	104
3	Do. . .	Loading line in I. Panel 50 ft. from place of pillar extraction.	Do. . .	200
4	Do. . .	No. 5 West Dip Haulage near top level of I. Panel. Return airway.	Do. . .	78
5	Colliery B. . .	West Dip Haulage near No. 14 Level.	Dishergarh .	110
6	Do. . .	150 ft. from face of No. 21 Level gallery.	Do. .	105
7	Do. . .	50 ft. from face of 19 Level . .	Do. .	105
8	Do. . .	No. 1 East Dip Haulage near No. 12 Level.	Do. .	130
9	Do. . .	No. 1 East Dip Haulage near No. 5 Level.	Do. .	145
10	Colliery A. . .	No. 20 Dip Haulage near No. 3 Level 300 ft. from face.	Do. .	105
11	Do. . .	No. 2 S. E. Cross-cut near No. 5 Level.	Do. .	100
12	Do. . .	No. 8 Dip Haulage 1,500 ft. from face.	Do. .	104
13	Do. . .	15 ft. from face of gallery. No. 20 Level.	Do. .	78
14	Do. . .	No. 8 Dip gallery 10 ft. above No. 20 Level 80 ft. from face.	Do. .	78
15	Do. .	No. 3 Dip Haulage road between Nos. 10 and 11 Levels.	Do. .	108

NOTE.—The incombustible and moisture determinations were

I.

at mines in the Raniganj coalfield.

Total weight of sample collected.	Percentage of sample passing through 30 mesh I. M. M. sieve.	Concentration of dust passing 30 mesh sieve. Oz. per c. ft. of air in roadway.	Analysis of sample.		Remarks.
			Ash.	Moisture.	
			Percentage.	Percentage.	
11 lb.	5·9	0·1	46·92	4·1	Haulage line packed with boiler ash. Little dust on sides.
6 lb. 10 oz.	1·4	0·01	20·21	12·0	The haulage line was packed with boiler ash. Floor was moist.
13 lb.	23·1	0·24	13·51	4·1	The road was dry and dusty.
8 lb. 11 oz.	1·9	0·03	12·60	11·9	The surfaces of the roadway were moist. The haulage line was packed with boiler ash.
6 lb. 5 oz.	2·0	0·02	11·55	7·01	Surfaces of roadway were moist.
9 lb. 13 oz.	8·0	0·12	15·05	2·44	Floor was moist for 2 ft. on dip side of gallery. Gallery was dry up to face.
5 lb. 10 oz.	10·6	0·09	9·49	3·26	The gallery was fairly clean but dry.
5 lb. 5 oz.	3·1	0·02	18·19	10·36	Floor damp and compacted. A small amount of dust on sides.
4 lb.	26·4	0·11	20·22	6·20	Part of floor was moist. A fair amount of dust on sides.
11 lb.	43·9	0·73	69·0	1·0	Very little dust on sides.
8 lb. 6 oz.	34·4	0·46	72·3	1·6	
16 lb. 1 oz.	37·8	0·93	80·0	1·2	
5 lb.	28·6	0·29	21·2	2·2	No stone dusting had been done. The face was hand worked.
8 lb. 4 oz.	62·0	1·05	74·0	5·0	Sample taken at limit of stone dusting and 70 ft. from serial No. 13.
9 lb.	39·8	0·53	75·0	1·9	

kindly made by Mr. B. Sen at the Indian School of Mines.

TABLE

Result of Sieve tests and analyses of samples

Serial No.		Place from which sample was taken.	Number of seam.	Area of cross section of roadway sq. ft.	
1	Colliery D. . .	Main dip haulage road 70 ft. down from No. 11 pit West Level.	13	135	Floor . . Sides .
2	Do. . .	Cross-cut between Nos. 2 and 3 panels used as locomotive haulage road.	13	135	Floor . Sides .
3	Do. . .	No. 3 panel, No. 3 Rise gallery West off No. 1 Main Rise.	13	132	Flo or . Sides .
4	Do. . .	No. 5 pit Main West Level, 150 ft. West of car-dumper.	13	108	Floor . Sides .
5	Colliery F. . .	1st Intermediate off No. 7 Level. A rib of coal between two sand packed galleries was being extracted.	18	152	Floor . Sides .
6	Colliery E. . .	No. 1 pit, South dip haulage near No. 4 Level.	15	124	Floor . Sides .
7	Do. . . .	No. 1 pit, 2nd Rise gallery from North dip haulage.	14A	42	Floor . Sides .
8	Do. . .	No. 1 pit North side main dip haulage road between Nos. 1 and 2 Levels.	15	154	Floor. Sides .
9	Do. . .	No. 1 pit, about 20 ft. from face of machine-cut gallery.	15	68	Floor .

NOTE.—The incombustible and moisture determinations were kindly made

II.

of coal-dust collected at mines in the Jharia Coalfield.

Total weight of sample collected. Oz.	Percentage of sample passed through 30 mesh sieve.	Percentage of sample passed through 90 mesh sieve.	Concentration of dust passed through 30 mesh sieve. Oz. per c. ft. of air space.	Concentration of dust passed through 90 mesh sieve. Oz. per c. ft. of air space.	Analysis of sample.		Remarks.
					Ash.	Moisture.	
	Percentage.	Percentage.			Percentage.	Percentage.	
192	29·4	12·8	·42	·18	29·0	1·56	Floor and sides were dry and dusty.
40	32·5	14·5	·10	·04	21·1	1·74	
153	27·2	10·8	·31	·12	40·5	1·2	Floor and sides were dusty.
46	31·3	12·4	·11	·04	25·0	0·34	
169	24·6	10·5	·31	·13	14·9	7·5	Pillars were being split and roof coal blasted in vicinity. The fine dust on floor was probably due to flitting of coal cutting machine.
3	33·3	13·3	·01	·003	17·4	9·0	
77·2	58·7	46·1	·42	·33	20·8	10·6	Floor was damp. Sides were extremely dusty. The dust from car-dumper was being carried in by ventilation.
80·0	61·1	46·7	·45	·35	14·8	2·8	
275	28·7	10·3	·52	·18	21·6	1·64	
16	17·5	5·6	·02	·006	15·34	0·95	
155	25·7	13·4	·31	·17	16·6	1·1	
0·8	87·5	50·0	·007	·003	14·5	4·9	
80·5	13·0	8·1	·25	·15	10·63	0·9	Hand-cut gallery, no blasting being done.
1·0	90·0	50·0	·02	·002	11·45	2·2	
90·0	46·6	23·6	·27	·14	10·96	0·9	For 9 months all coal hauled on this road was from 14A seam.
20·0	34·5	19·5	·04	·03	13·15	1·34	
40·5	38·3	14·8	·23	·09	15·25	1·98	The gallery looked clean and had been swept. The quantity of dust on the sides was negligible.

by Mr. B. Sen at the Indian School of Mines.

APPENDIX VII.

Laboratory tests of the ignitibility of a Coal-dust cloud by an electric arc, made by Dr. B. B. Banerji.

Description of apparatus.—The apparatus employed which was of the simplest construction is shown, diagrammatically, in Figure 2.

A glass tube, 1½" diameter and 12" long, was closed at both ends by cork stoppers A and A-1. Passing through the stopper A was a glass tube into which a copper wire W (No. 20 gauge) had been fused, and through a second hole there was a glass tube with a bulb B at its upper extremity. The glass bulb B was provided with four or five holes of about 1/20" diameter. Passing through the cork stopper A-1, there was a glass tube fitted with a copper wire W-1 similar to the wire W, and also a short piece of glass tube bent at right angles which served as an air release pipe.

The apparatus was mounted vertically with the bulb B at the bottom and the lower end of the tube E was connected to a foot-blower. The copper wires W and W-1 were coupled to four Leyden jars connected in parallel which, in turn, were connected to the secondary winding of a Rhumkorff induction coil. Current in the primary circuit of the induction coil was provided by two accumulators joined in series and controlled by a suitable switch.

The gap between the wires W and W-1 was about ¼".

Experimental details.—A small amount of fine coal-dust (the fineness was not determined) was introduced into the apparatus by opening the stopper A-1, and after replacing the stopper air was pumped into the apparatus by means of the foot-blower in order to maintain a cloud of coal-dust inside the tube. Immediately afterwards a spark was passed between the wires W and W-1. Although a fat and steady spark was maintained the coal-dust cloud was not ignited. The experiment was repeated with coal-dust which had been dried in a steam oven and cooled in a desiccator. This time the coal-dust cloud was ignited, and further experiments resulted in ignitions and occasionally explosions which caused a popping out of the cork stoppers.

Later, as the conditions of the experiments became more and more familiar, it was found possible to maintain a steady flame in the middle of the tube by judiciously pumping the foot-blower. It was observed that the inflammation of the coal-dust occurred when the coal-dust cloud was subsiding and as the density of the cloud decreased further the flame disappeared. It appeared, therefore, that the coal-dust had definite limits of concentration in air beyond which the cloud was incapable of being ignited. Although careful observations were made in course of the later experiments it was impossible to ascertain the mechanism of the start of the flame.

APPENDIX VIII.

Regulations in respect of Coal-dust applying to coal mines in Great Britain and South Africa.

GREAT BRITAIN.

Extracts from Coal Mines Act, 1911, and the General Regulations made under the Act.

Prevention of Coal-dust.

Section 62.—In every mine, unless the floor, roof, and sides of the roads are naturally wet throughout,—

(1) arrangements shall be made to prevent, as far as practicable, coal-dust from the screens entering the downcast shaft; and, in the case of a mine newly opened after the passing of this Act, no plant for the screening or sorting of coal shall be situated within a distance of eighty yards from any downcast shaft unless a written exemption is given by the Inspector of the Division;

(2) the tubs shall be so constructed and maintained as to prevent, as far as practicable, coal-dust escaping through the sides, ends, or floor of the tubs, but any tub which was in use in any mine at the date of the passing of this Act may, notwithstanding that it is not so constructed, continue to be used in that mine for a period of five years from the said date;

(3) the floor, roof and sides of the roads shall be systematically cleared so as to prevent, as far as practicable, coal-dust accumulating;

(4) Such systematic steps, either by way of watering or otherwise, as may be laid down by the regulations of the mine shall be taken to prevent explosions of coal-dust occurring or being carried along the roads.

Regulation.—1. The following regulations shall apply to all mines in which coal other than anthracite is worked.

2. The floor, roof and sides of every road or part of a road which is accessible shall be treated in one of the following ways, either:—

(*a*) they shall be treated with incombustible dust in such manner, and at such intervals, as will ensure that the dust on the floor, roof and sides respectively shall always consist throughout of a mixture containing not more than 50 per cent. of combustible matter; or

(*b*) they shall be treated with water in such manner, and at such intervals, as will ensure that the dust on the floor, roof and sides respectively is always combined throughout with 30 per cent. by weight of water in intimate mixture; or

(*c*) they shall be treated in such other manner as the Board of Trade may approve.

Provided that the percentage of incombustible dust required under this Regulation may be reduced by an amount equivalent to the percentage of water present in the mixture.

Provided also that the obligation imposed by this Regulation shall not apply in respect of any road or part of a road, either

(*a*) in a seam in which anthracite only is worked, or

(*b*) if, and so long as, the natural conditions thereof as regards presence of incombustible dust and moisture are found by tests made in accordance with these Regulations to be such as to comply with the foregoing requirements.

5. The incombustible dust used for the purpose of the preceding regulation shall contain not less than 50 per cent. by weight of fine material capable when dry of passing a sieve with 200 meshes to the linear inch (40,000 to the square inch).

Provided that if a larger proportion of incombustible dust is used than is required under the foregoing regulation, the percentage of fine material, aforesaid contained in the incombustible dust may be reduced proportionately, but shall not fall below 25.

6. Paragraph 3 of Section 62 of the Act shall be amended to read as follows:—The floor of every travelling road shall be cleared of dust at regular intervals of time so as to keep it free from all accumulations of dust. The intervals shall be fixed by agreement between the Manager and the workmen employed in the mine, or their representatives, or in default of agreement, by the Inspector of the Division.

"Travelling road" means a road used by the main body of any shift employed in the mine for travelling to or from their working places, and where the mine is divided into districts, the road used by the main body of men employed in a district.

7. In the foregoing regulations "road" includes all roads of any description extending from the shaft or outlet to within 10 yards of the coal face, but chutes from the coal face down which coal is thrown, offices, stables, engine-houses, motor switch and transformer rooms and pump-rooms, shall not be deemed to form part of any road.

South Africa.

Extracts from the Mines and Works Act of the Union of South Africa as amended up to 1917.

Regulation 3 (7).—At every coal mine the screening or other plant for the treatment of minerals shall not be erected within ninety feet of any shaft or other entrance to the mine. At existing mines as far as practicable adequate provision must be made to prevent coal-dust from entering the shaft or other entrance to the mine.

Regulation 65 (1).—In any coal mine or part thereof which, in the opinion of the Inspector of Mines, is dry and dusty, protective measures approved by him shall be taken for the prevention of coal-dust explosions.

Regulation 65 (2).—Any mine or portion thereof may be exempted from Section (1) of this Regulation by the Inspector of Mines provided fire-damp has not been reported within the preceding six months and where the proportion of marsh gas contained in the body of the air in any return air-way is less than one-half per cent.

Regulation 65 (3).—(*a*) In any coal mine, not exempted by the Inspector of Mines, every main haulage road and every main intake air-way shall be protected from coal-dust explosion by adequate watering, stone-dusting, or other protective measures approved by the Inspector of Mines.

(*b*) These protective measures shall extend from the shaft to within one hundred (100) yards and, where watering is employed, to within thirty (30) yards of the working face.

(*c*) The floor, roof and sides of the haulage roads and intake air-ways shall be systematically cleared so as to prevent as far as possible coal-dust accumulating, and such coal-dust shall be sent out of the mine.

4. (*a*) In each ventilating district of any fiery mine not exempted by the Inspector of Mines there shall be maintained at a maximum distance of one hundred (100) yards from the working face a protective zone, not less than 50 yards in width, which shall effectively separate such ventilating district from the main return air-ways, adjacent districts and disused workings.

(*b*) Such protective zone shall be safe-guarded against explosions by adequate watering, stone-dusting, or other measures approved by the Inspector of Mines.

(*c*) No such ventilating district shall at any time contain more than two hundred (200) persons.

5. In any coal mine which is dry and dusty the coal tubs shall be so constructed and maintained as to prevent as far as practicable coal-dust escaping through the sides, ends, or floors.

6. Any stone-dust used for the purposes of this Regulation shall be non-inflammable, finely ground dust, prepared from shale or other material containing no injurious free silica.

106 (11) The ganger or miner shall not blast in a coal mine if the place where the shot is to be fired is dry and dusty, unless a permitted explosive as referred to in Regulation 98 be used or unless the place of firing and all contiguous accessible places within a radius of 20 yards therefrom are at the time of firing in a wet state through watering or other treatment equivalent to watering in all parts where dust is lodged, whether roof, floor or side.

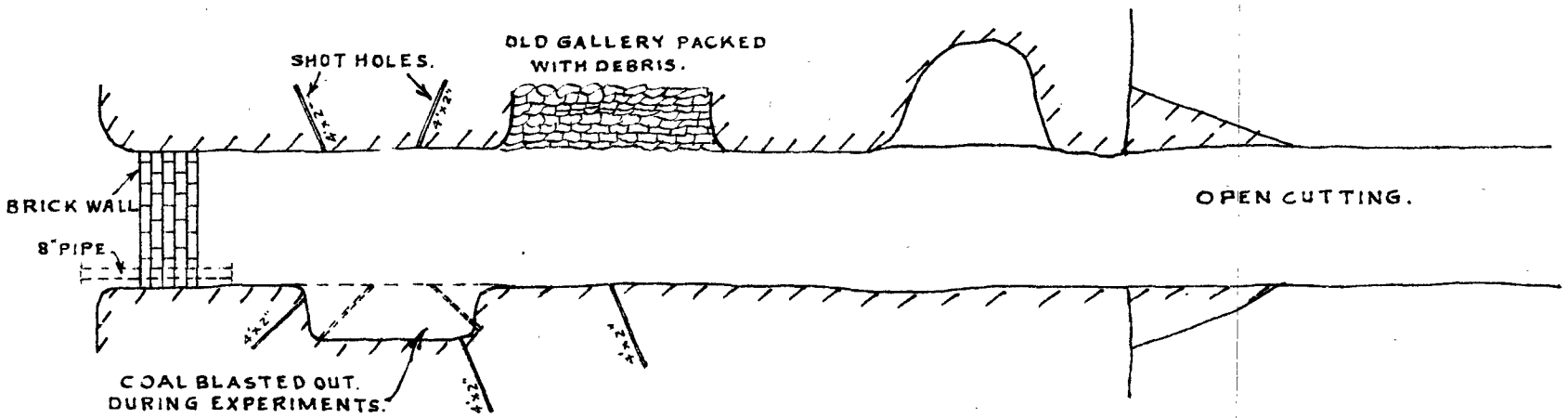
MGIPC—L—VIII-5-9—18-7-32—800.

Figure 1.

Coal Dust Committee.

Plan & Section of the Incline in coal in which Coal Dust experiments were carried out in February-March 1931.

Scale 1 Inch = 10 Feet.



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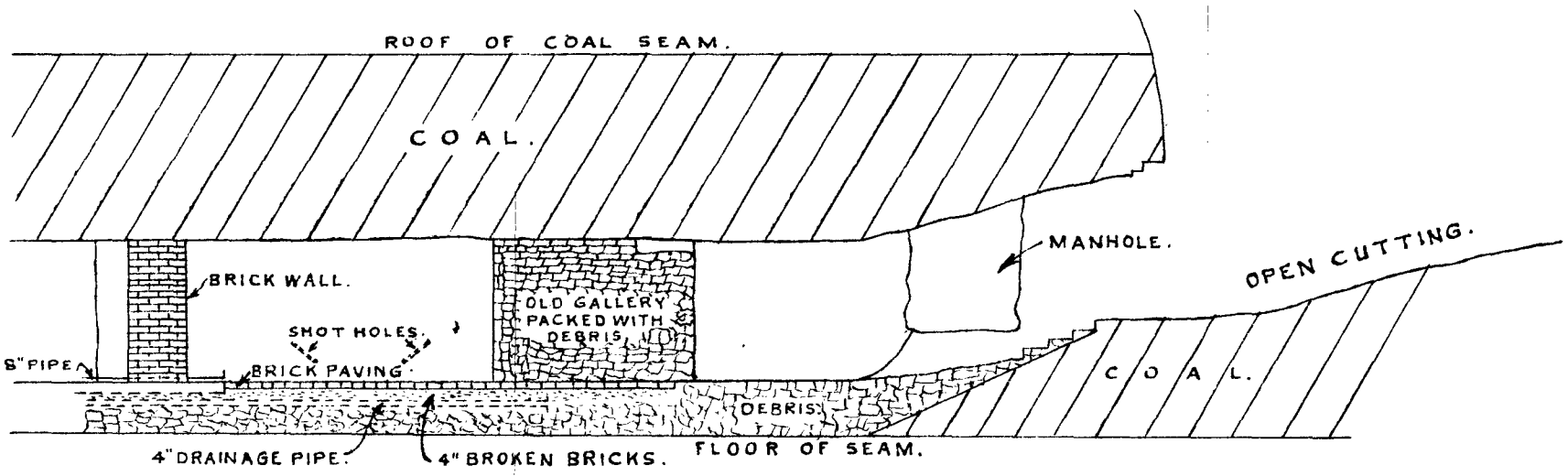

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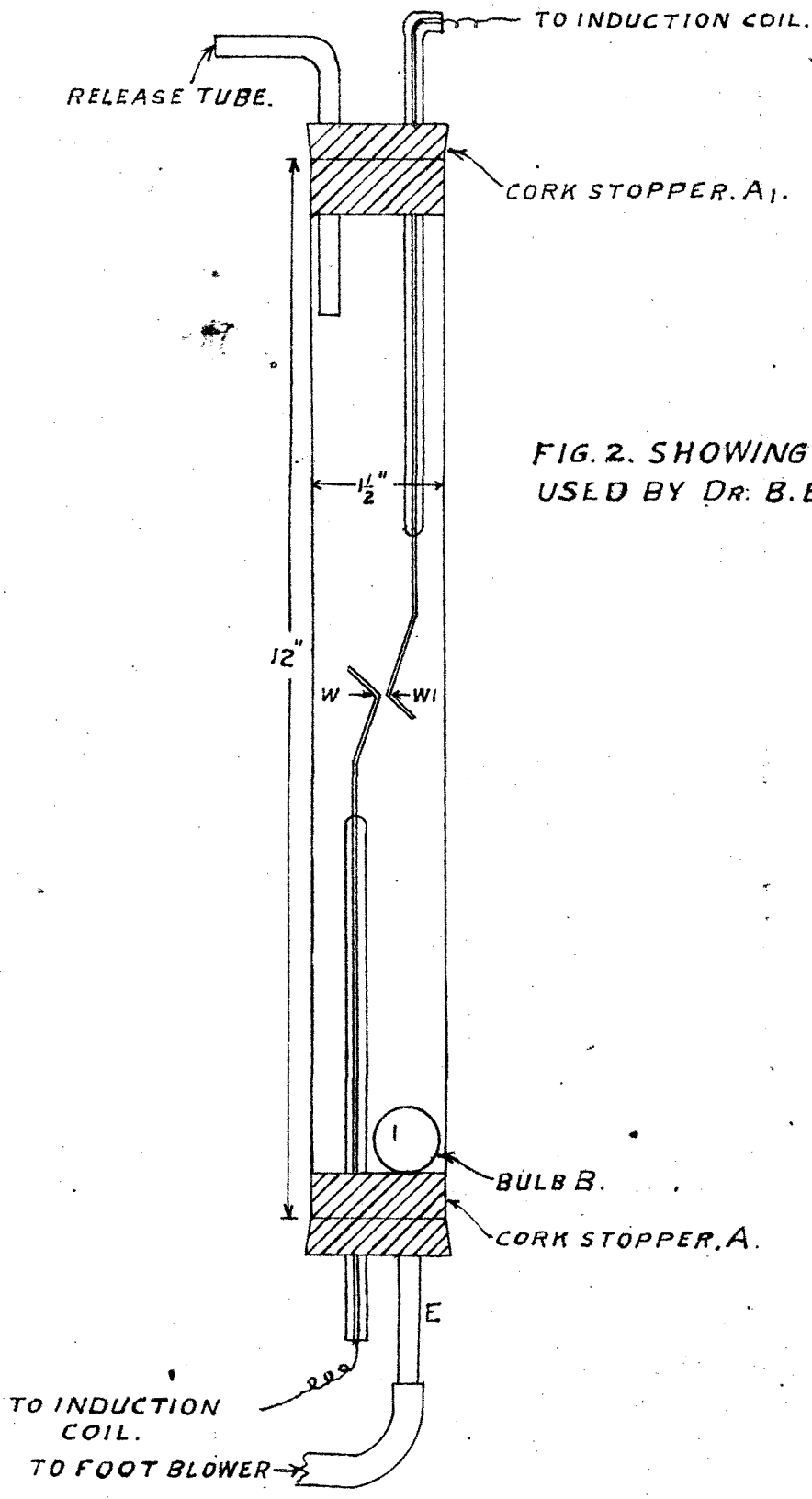

FIG. 2. SHOWING APPARATUS USED BY DR. B. B. BANERJI.

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of the

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on the

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CROP PLANNING CONFERENCE, JUNE, 1934.

AGENDA.

I.—Rice.

Consideration of the following questions :—

(1) Keeping in view the world position, internal consumption, stocks carried over and decreased exports overseas, would it be correct to state that there is an over-production of rice (*a*) in rice producing provinces or other areas ; (*b*) in India as a whole.

(2) If the answer to the first question is in the affirmative, what steps are desirable and practicable to deal with the problem—

A. By way of restriction of the area under rice.

(*a*) If restriction is recommended, what is the extent of the area to be reduced (if any) in the case of each rice producing province ?

(*b*) What are the alternative crops that are recommended in the case of each province or part of a province ? What are the difficulties in the way of the substitution ?

(*c*) In any such change-over, what would be the effects on the Government revenue, both in the shape of land assessment and water-rate, and what would be the effect on the land-owner and the cultivator ?

B. By way of development of markets (*i*) external and (*ii*) internal.

In considering (*i*) discuss any existing restrictions and the possibility of their removal ; also the question of improvements in the quality or milling of the rice.

Also consider in both cases the effect of railway and steamer freights.

(3) In case of restriction of import of foreign rice into India.

(*i*) What would be the effect of such restriction on competition of foreign with Indian rice in outside markets ; and

(*ii*) What form is retaliation by the countries affected likely to take ?

(4) Is the creation of some organisation necessary or desirable for the purpose of improving and developing the cultivation and marketing of rice ? If so, what should be its functions and composition and how should it be financed ? Should it be permanent ?

II.—Wheat.

Consideration of the same questions as under rice.

III.—Cotton.

All that is contemplated is a general review of the position in order to have a complete picture of India's crops. No questions are set down as the subject is dealt with in detail by the Indian Central Cotton Committee.

IV.—Jute.

It is suggested that a general review of the jute position would be sufficient as all the relevant issues have been set out in the Bengal Jute Inquiry Committee's Report which is now under consideration by the Bengal Government. The Secretary's note on jute summarises the position.

V.—Oil-seeds.

A. *Ground-nut and castor.*

(*a*) In view of the fall in exports of ground-nut and castor seed what measures are recommended by way of development of markets (*i*) external and (*ii*) internal.

In considering (*i*) discuss any existing restrictions and the possibility of their removal ; also the question of improvements in their quality and marketing.

Consider in both cases the effect of railway and steamer freights.

(*b*) In view of the increasing exports of ground-nut oil and castor oil, what steps should be taken to stimulate the oil crushing industry ?

B. *Linseed.*

In view of increasing exports, what steps, if any, should be taken to increase production and improve quality and marketing ?

Consider particularly the possibility of expansion in the Central Provinces, United Provinces and Bihar and Orissa.

C. *Rape and mustard, sesamum and cotton-seed.*

What measures are recommended by way of development of markets, external and internal ?

D. *Linseed, castor, ground-nut, rapeseed and sesamum oils.*

In view of the preference in the United Kingdom, are any steps recommended to stimulate the export trade in these oils ?

E. *Coconuts* are dealt with in a report by the Special Inquiry Officer which is under examination.

VI.—Sugarcane.

Generally review the position. The matter is being dealt with in detail by the Sugar Committee.

VII.—Tobacco.

Review the position (*a*) with regard to production of cigarette tobacco and (*b*) of improved varieties suitable for flue curing.

VIII.—Fodder crops.

IX.—Fruits and vegetables (including Roots).

X.—Cereals other than rice and wheat, specially, barley, jowar, bajra, maize and gram (including pulses).

Note by Vice-Chairman, Imperial Council of Agricultural Research, on the Proceedings of the Crop Planning Sub-Committee of the Advisory Board of the Imperial Council of Agricultural Research.

In the following note I have attempted to summarise the conclusions arrived at by the Sub-Committee of the Imperial Council of Agricultural Research that has been considering the subject of Crop Planning. The full proceedings are available to members that want them.

The items are dealt with according to the order in the Agenda paper.

I.—RICE.

(1) On behalf of Madras it was pointed out that there has been a change in the position of rice. Ten years ago it was thought that 40 per cent. of the population of Madras ate rice and on the assumption that an adult ate 1.25 lbs. per day it was supposed that there was a surplus in rice but that was not the position to-day. There had been a small increase in area but the population had increased by over 11 per cent. and many more people were now eating rice than was the case ten years ago. Consequently the assumed surpulses of ten years ago do not now exist. Madras consumed practically all the rice it produced and there were regular imports from Burma and there was therefore no case of over-production.

Bombay had to supplement its production of rice by imports from Burma and there was therefore no question of surplus. In Sind the production of rice was just equal to consumption.

Bengal's production was short of its needs by 1½ lakhs of tons annually and that was supplemented from Burma.

The United Provinces were a deficit province in the matter of rice and had to supplement its production from the Central Provinces and Bengal. The question of rice was not important to the Punjab.

Bihar and Orissa, in spite of its large area under rice did not produce enough for its consumption and had to supplement its production from the Central Provinces and Bengal, the latter probably importing from Burma through Calcutta.

Central Provinces.—As regards the Central Provinces when the crop was a 11 annas crop, it was just sufficient for internal consumption. When the crop exceeded 11 annas it easily exported the surplus to the adjoining provinces.

In Assam the production and consumption were equal.

As regards Burma it had normally an exportable surplus of 3 million tons per annum but all the surplus passed at once into India proper, Ceylon, Malaya and the Far East. There was a very definite demand for Burma rice and there was no question of over-production.

It was agreed by the Sub-Committee that there was no over-production of rice either in India as a whole or in any part of it.

In view however of the fact that the countries of the east which were taking Indian rice, namely Ceylon, Malaya and Japan, were attempting to be self-sufficient in the matter of their rice production and that the last country had succeeded in becoming self-sufficient, and also of the competition that Indian rice was meeting with in foreign markets from Siam and

Indo-China in the East and Italy and Spain in the West it was urged that it would be wise to call a halt to a further expansion of the rice area in India. The following proposition was moved and carried by 7 votes against 5 :—

"That in view of the present world conditions in the matter of rice production, no Provincial Government should ordinarily offer any stimulus to an increase in the present area under rice."

The representatives from Bengal, Burma, the United Provinces, Sind and the Central Provinces constituted the minority.

(2) In view of the answer under (1) above no restriction is recommended and the questions under (2) A do not arise.

(2) B. As regards internal markets it was agreed that the development of internal markets was of great importance and that this development could best be pursued by means of the marketing scheme now under the separate consideration of the Imperial Council of Agricultural Research. As regards external markets the Sub-Committee made the following recommendations :—

(*i*) that negotiations should be opened with Ceylon and British Malaya with a view to obtain preference for Indian rice,

(*ii*) that as soon as financial circumstances permit the export duty on rice should be removed,

(*iii*) that the specific duty imposed by the Ottawa Agreement on imports of rice from foreign countries to the United Kingdom should be extended on paddy to the extent of three farthings per lb. At present import of rice into the United Kingdom is subject to a specific duty of a penny per lb. while foreign paddy is taxed at 10 per cent. *ad valorem*. It was pointed out that Spain was increasing her exports of rice in the form of paddy to England in order to get the benefit of this differentiation, and

(*iv*) that Burma and Bengal which produced rices suitable for English and Continental markets should continue their experiments in the matter of improving the quality of such rices.

As regards railway freights the Sub-Committee was informed by Mr. Calder of the Railway Board that a general reduction in the freights on agricultural commodities was not practicable but that where special rates were required to facilitate particular movements of special crops the question would always receive sympathetic consideration. The Railway Board would always consult agricultural officers and the new marketing staff in connection with such proposals.

(3) The Sub-Committee felt that it would not be wise to impose any restrictions on import of foreign rice into India by means of either an absolute prohibition or an unreasonably heavy tariff. It considered however that a reasonable and moderate rate of duty was unlikely to lead to retaliatory measures on the part of foreign governments affected and passed the following resolution :—

"That an import duty at the rate of Rs. 1-4-0 per maund of rice and 15 annas per maund of paddy be imposed on imports of rice and paddy from foreign countries."

(4) The Sub-Committee unanimously recommended that it was desirable to have a standing committee of the Imperial Council of Agricultural Research on rice. The functions of such a Committee which should be constituted under the Rules and Regulations of the Council, should be advisory and its constitution should be on the lines of the other standing committees of the Council. It should be financed from the funds of the Council.

The Director of Agriculture, Madras, under instructions from his Government asked that a quota should be fixed for rice which Burma was importing to Madras ports. The Sub-Committee was of the view that it was wrong in principle to suggest any restrictions on any inter-provincial trade within the Indian Empire. The proposal was not therefore approved.

II.—Wheat.

(1) On behalf of the Punjab it was pointed out that in the last ten years the area under wheat had increased by 6 per cent. while the population had increased by 10 per cent. As regards the yield roughly half the area depended on rain and considering the not infrequent occurrence of bad monsoons, the production could not be termed excessive. The surpluses of normal years were easily disposed of by export to adjoining provinces and Calcutta. The real danger would arise when Sind increased its wheat area to the maximum limit of two million acres. The representative from Sind considered that with the normal growth in Indian population, the increasing consumption of wheat in preference to inferior grains and the risks to which food crops were exposed by vicissitudes of season, it would be unwise to limit the growing acreage under wheat in Sind. In any case, if the Sub-Committee decided that restriction was necessary, it should impose the restriction on an old province like the Punjab and not on Sind. For the United Provinces it was stated that with the increase in population the surplus of wheat in that province was nothing serious and was easily absorbed by the deficit provinces in India. In the Central Provinces the surplus was about 50,000 tons and there was no difficulty in exporting it to other parts of India. As regards Bihar and Orissa it was a deficit province in the matter of wheat and imported wheat for its own consumption from other areas of India. Bombay was hardly self-sufficient in the matter of wheat production and there was no question of over-production. The conclusion of the Sub-Committee was that there was no over-production at present. It was, however, pointed out by one of the members of the Sub-Committee that the internal requirements of India in the matter of wheat amounted to about 9½ million tons annually, that no export market seemed possible for several years to come, and that in the current year but for unexpected seasonal damage the sown area of over 35 million acres of wheat in India should have produced a crop of about 11 million tons. He therefore proposed that something should be done to limit the production to the figure of 9½ million tons. He suggested that the area under wheat in India as a whole should be reduced by 2 million acres and thought that on this area linseed and barley could be substituted for wheat with advantage. Finally he moved the following resolution :—

> "That keeping in view the world position in production and the trade in wheat it is undesirable that the area under wheat in India as a whole should exceed 33 million acres."

This resolution was lost by 6 votes against 4. Then the following resolution was moved :—

> " In view of the world position in wheat and the possible danger of over-production this Sub-Committee recommends that no fresh stimulus should be given to the expansion of wheat cultivation in India and every effort should be made for the substitution of other crops for wheat."

This resolution was agreed to unanimously.

(2) A. In view of the answer under (1) none of the three questions under A arise.

B. As regards external markets, in view of the fact that the carry over of wheat stocks outside India amount to more than a year's requirements of consuming countries, it was agreed that there was not much chance of India being in a position to export any wheat during the next few years. The following answer was returned unanimously :—

> " So long as world prices remained at the present level and the wheat import duty remained at the present level and the wheat import duty remains, there is no immediate prospect of developing external markets for Indian wheat."

As regards internal markets and railway freights the same answer was returned as under rice.

(3) In view of the existence of the wheat import duty the questions under 3 do not arise.

(4) The Sub-Committee unanimously recommended the creation of a Standing Committee on wheat of the Advisory Board of the Imperial Council of Agricultural Research on the same terms as those suggested for the Committee on rice.

III.—Cotton.

The two questions to be considered in connection with cotton, *viz.*, the scope for an increase in the total area and the selection of varieties to be cultivated, were being dealt with carefully by a special Sub-Committee of the Indian Central Cotton Committee. It was not therefore necessary for this Sub-Committee to go into the matter.

IV.—Jute.

All the questions in connection with Jute were, as explained in the printed note circulated to the Sub-Committee, under the consideration of the Bengal Government on the report of their Special Enquiry Committee and the Sub-Committee considered that no action at this stage was necessary.

V.—Oil-seeds.

A.—*Ground-nut and castor.*

(*a*) As regards ground-nut, the Sub-Committee came to the conclusion that there was no need for placing any restrictions on its cultivation, but that there might be room for cautious expansion. With reference to

external markets, in view of the growing competition in the United Kingdom market from foreign Soya Beans and other oil-seeds and from foreign fats and oils, the Sub-Committee passed the following resolution :—

> " That this Sub-Committee recommends that the Government of the United Kingdom be approached with a proposal to impose an import duty on all foreign fats, oils and oil-seeds which compete with oil-seeds produced in the Empire."

As regards castor seed, the Sub-Committee considered that its position was satisfactory and that there was room for its development rather than for its restriction. The Indian Oil Crushing Industry Committee of the Imperial Council of Agricultural Research was dealing comprehensively with the questions of the improvements in the quality and marketing of all oil-seeds and these questions may safely be left to that body.

(*b*) It was pointed out that there had been great increases in the export of groundnut oil, especially to the United Kingdom, after the grant of the Ottawa Preferences and that the question of stimulating the industry might be left to the Indian Oil Crushing Industry Committee of the Imperial Council of Agricultural Research.

B.—*Linseed.*

The large increases in the exports of linseed to the United Kingdom since the grant of Ottawa Preferences were pointed out and the Sub-Committee emphasized the need for extending the cultivation of linseed in India, especially of the improved rust resistent varieties. It was also agreed that the favourable position in regard to linseed should be made widely known amongst cultivators and merchants.

C.—*Rape and mustard, sesamum and cotton-seed.*

So far as foreign exports were concerned the resolution referred to under A (*a*)—Groundnut—would cover the case of these oil-seeds. The question of developing internal markets should be left to the Indian Oil Crushing Industry Committee of the Council.

D.—*Linseed, castor, ground-nut, rapeseed and seasamum oils.*

Complaints had been made by merchants in Bombay that facilities for tank wagons on railways and tank accommodation on steamers and facilities for storage of these oils at the Indian sea ports were lacking. The Sub-Committee resolved that action should be taken to improve the position in these respects.

VI.—Sugarcane.

The following resolution was adopted :—

> " From the point of view of general crop-planning the sugarcane area in India is not so large as to affect the general question. There is insufficient knowledge of the production and consumption of *gur* to enable the Sub-Committee to make any specific recommendation regarding the maximum sugarcane area."

VII.—Tobacco.

The Sub-Committee considered that there was ample scope for an expansion of area under tobacco provided it was of the right type. The bulk of tobacco produced in India was consumed in India itself ; this was the heavy type of tobacco. What India required to develop was the light bright tobacco which was suitable for cigarettes. The Committee noted with satisfaction the progress made in this direction and considered that this crop could be adequately dealt with by the Tobacco Committee which was shortly to be formed by the Council.

VIII.—Fodder crops.

It was considered that there was great scope in India for an increase of fodder crops but that propaganda for this purpose would be ineffective unless an incentive was given to the ryot to grow fodder where it was not now grown. The Committee was of opinion that this could best be done by a stimulus to the indigenous dairy industry. The following resolution was passed :—

> " In order to develop and organise the Indian dairy industry this Sub-Committee recommends that a protective duty be levied upon all imports of dairy products which are or can be produced in this country."

IX.—Fruits and vegetables (including Roots).

The Sub-Committee noted that at the present moment all the provinces were making special efforts to extend and improve these crops and considered that their efforts should be co-ordinated more than they were now.

X.—Cereals other than rice and wheat, specially barley, jowar, bajra, maize and gram (including pulses).

It was considered that statistics in respect of these crops were extremely insufficient and the Sub-Committee commended to the Government of India the possibility of including the crops mentioned under this subject in the all-India Forecasts.

General.

In view of the Sub-Committee's decision not to recommend any restrictions on the present areas under rice and wheat, the question of suggesting substitutes for these crops did not arise. The Sub-Committee however considered that in the interest of sound crop planning the question of alternative crops should be discussed. It was pointed out by one of the Local Governments' representatives that there was no possibility of taking any steps in this direction during the coming year. It was a matter not for one year or two but at the lowest for ten years. The following suggestions were made :—

(*i*) *Madras.*—Madras could increase its area under cambodia cotton by 50,000 acres. It could put in another 50,000 acres under sugarcane in the next three or four years by which time Madras considered it would be self-supporting in the matter of sugarcane. In the last five years it had increased the area under plantains by 14 per cent. It could increase its area still further if the railways would agree to

grant concessional rates for fruits and facilities for their transport.

(*ii*) *Bombay.*—Bombay considered that the area under sugarcane, mangoes, plantains and pine apples could be increased.

(*iii*) *Bengal.*—Bengal had recently increased its sugarcane area but there was scope for some more increase. It could also increase its area under fodder crops as a ready market for milk and milk products existed in Calcutta. What was required was a stimulus to the Indian dairy industry.

(*iv*) *United Provinces.*—In the United Provinces there was room for a high quality of barley suitable for malting. It could increase the area under linseed with proper rust resisting varieties and also under san hemp.

(*v*) *Punjab.*—In the Punjab there was no information available about substitute crops except in respect of Soya Bean in the case of which prices were however very low. The Sub-Committee suggested that an experimental consignment of suitable soya beans of uniform variety should be sent to England.

(*vi*) *Burma.*—As regards Burma it was pointed out that the only alternative crop possible is sugarcane and the maximum limit to which this could be increased was 100,000 acres even under favourable conditions.

(*vii*) *Bihar and Orissa.*—Bihar and Orissa was hoping to show a further increase under sugarcane. Its autumn rice in unprotected areas in Bihar proper was precarious and it was quite prepared to replace it by more remunerative crops. If protection is afforded to the Indian dairy industry, the Province would gladly go in for fodder crops for which there is a great need. It could also increase its area under linseed with efficient marketing.

(*viii*) The Central Provinces are already taking steps to increase the area under linseed but there were difficulties chiefly connected with the price in this connection. It could also increase the acreage under groundnut and sesamum.

(*ix*) Assam thought that there was scope for the expansion of area under linseed and sugarcane.

The Sub-Committee was of the opinion that one great obstacle in the way of alternative crops was the absence of inducement to the ryot to grow them. It thought that some security should be afforded against competition from foreign countries and passed the following resolution :—

> " That in order to promote the more efficient production and marketing of Indian agricultural produce, this Sub-Committee recommends that the Government of India should consider the advisability of imposing protective duties on the imports of animal and agricultural produce which compete with home-grown produce."

In order to improve agricultural statistics the Sub-Committee also made the following recommendations :—

(*i*) that in the monthly railborne trade returns figures should be given by trade blocks instead of by provinces only ; also that the value of commodities should be given if practicable, and

(*ii*) that the railway freights for agricultural commodities from and to representative centres should be published in the weekly Indian Trade Journal. The Railway Board's representative thought that there would be no difficulty in accepting this recommendation.

PROCEEDINGS.

Friday, the 8th June 1934.

The Crop Planning Conference met in the Members Room of the Legislative Assembly Chamber at 10 a.m., the Hon'ble Khan Bahadur Mian Sir Fazl-i-Husain in the Chair.

In opening the proceedings of the Conference, the Chairman made the following remarks :

Gentlemen : Before we proceed with our work, I think I ought to welcome you to Simla. Representatives from Madras, Burma and Assam have had a very long, tedious and probably troublesome journey to get through, and those of you who have been at work during the last three days in the Advisory Committee have not had, I think, time to get any rest after your arduous journey. From what I have seen of the Agenda it seems that there is not much rest in store for you during the next two days. However, my apology for giving you all this trouble to come these long distances is the extreme importance of the work that is to be done by this Conference. We know too well the gravity of the situation. We also know that for some three years or more the situation has been very grave and the hopes that were at one time entertained of this wretched economic depression passing away have not been realised. Some people who are not as optimistic as others are inclined to the view that we must not treat this economic depression lightly and make ourselves believe that it is but a passing phase but that we had better deal with it seriously and see what, if anything, can be done. From time to time people have been urging the raising of the prices. If we can raise the prices, the whole trouble will be over. When news comes to India from other great countries of the heroic efforts that are being made to raise the prices, naturally we ourselves as well as the masses feel, " If other people are trying to raise the prices, why should we not do the same ? " From time to time suggestions have been made of altering the exchange ratio and increasing the currency and I have no doubt the members of the Conference are fully aware of the fact that these possibilities have been most carefully considered, and it is only because it has not been found possible to proceed along those lines that no particular action has been taken. The third possibility that has been suggested is : Is there not something wrong in the crop planning of India ? Is the area under cultivation in India being put to its best possible use, producing the largest possible amount of wealth ? Is it not possible that there might be some commodities which are over-produced or some commodities which are not produced in sufficiently large quantities ? If so, there must be a re-adjustment. This is really the subject which this Conference has been called to discuss. The immediate cause of calling this Conference was certain discussions which took place when the Provincial Economic Conference met in Delhi. I believe some of you were present in that Conference. There the question of rural indebtedness was taken up and kindred subjects were also discussed. There a number of representatives from various provinces urged that possibly relief might be obtained if the

possibilities of suitable cropping were examined. These suggestions were taken up by us and the Council of Agricultural Research set itself the task of collecting all relevant material. I believe that material has been circulated to all the honourable members of the Crop Planning Conference under the heading " Statistics and Graphs ". Of course, this is just a mass of statistics but I have no doubt that with your expert knowledge of these affairs you will be able to draw inferences from them and perhaps formulate schemes. Then there are a large number of notes written by Directors of Agriculture from different provinces and these afford the most valuable material for the consideration of this Conference. Then there are three or four notes on some important subjects like jute, sugarcane and cotton, subjects which are already being dealt with by special committees of an All-India nature or, at all events, of a nature on which all interests relating to that subject are represented. Therefore, it is not necessary for me to detain this Conference for any length of time. Here we have a mass of material which was presented to the Advisory Committee, which was requested to deal with an agenda and give advice on the various items covered by that agenda. I believe the proceedings of the first day and of the second day of the Conference have already been circulated to honourable members. The proceedings of the third day will probably be circulated by this afternoon, and we are indebted to the Vice-Chairman of the Council for the Note which he hurriedly prepared last night and which I believe has also been circulated. Some members may have had time with their early breakfast to have glanced at it : others may not have had time. I think the best course for the Conference to pursue would be to take up this agenda (pages 5-6 *ante*) and, in the light of that Note (pages 7-14 *ante*) and the proceedings of the first day of the Committee, to proceed to deal with this agenda. Unless there is a suggestion different from this, this is the course I intend to pursue.

The first item on the agenda is Rice—consideration of the questions set down. I believe Members have this agenda before them. I believe it would be best if opinions on the subject were expressed by Provinces rather than by individuals. I shall be glad to hear Madras on the subject.

Mr. H. M. Hood.—Sir, the first question is whether in the opinion of the Madras Government there is over-production of rice ; and I think I can answer that question on behalf of Madras very briefly indeed. The Madras view is, very emphatically, that so far as the Madras Presidency is concerned, there is no over-production of rice. The area under rice is about 30 per cent. of the total cultivated area. That percentage has not increased materially. In fact I think it has slightly diminished in the course of the last ten years. The actual area under rice has slightly increased, the production has accordingly increased to a certain small extent over that period, but it has not increased anything like as much as has the population of the Presidency ; and the Madras Government think there can be very little question that so far as this province is concerned, there is no such thing as the over-production of rice.

Chairman.—Perhaps there are a few points some members would like to be more definite about. It is stated, for instance, that an adult in Madras eats 1.25 lbs. per day of rice. Is that correct ?

Mr. H. M. Hood.—That is the figure taken from the jail rations.

Diwan Bahadur T. Raghaviah.—Ordinarily the Madras prisoner does not get rice every day but he is allowed rice every day for certain special reasons. The scale allowed is 1.25 lbs. per day. He also gets some vegetables, dal, and gingili oil in addition.

Mr. H. M. Hood.—According to the experiments of the dietetic experts (Col. McCarrison for instance) they have put down the requirements of an adult at about a pound and a half of cereals a day, but that is in addition to vegetables, I believe, and other articles of diet. But in the case of the Madras ryot and the population at large, they do not get the extra vegetables and so forth to a material extent because they cannot afford to, and the actual production of cereals in the Presidency including imports provides, I think, only for about 1.3 lbs. of cereals per adult head of the population. That is a very clear indication that we do not produce more than is required, though it is possible one might produce more than people could afford.

Rai Bahadur B. B. Mukharji.—So far as Bengal is concerned, it has already been seen that we fall short of the requirements of consumption by near about one and one-fourth million tons. Bengal, as you are all aware, is very well-suited for rice production. We have got a climate suited for it, and a rainfall quite suited for it, the cultivators are good experts in the production of rice, and yet we sow about 48 per cent. of the total cultivated area with rice, and we are already short of the total amount that we need for our home consumption, and we do import from Burma and other places, mainly from Burma. So there is unquestionably no over-production; on the other hand, we are already not quite self-contained, and we would very much like to be self-contained, and there is hardly any room for reduction in the area.

Chairman.—Who produces rice cheaper—Burma or Bengal?

Rai Bahadur B. B. Mukharji.—I am quite sure that our rice is much finer, much sweeter and at the same time more nutritious; as a matter of fact Burma rice is only taken by our people as a matter of dire necessity. If we can get our own rice, our people would not like to take Burma rice.

The Hon'ble Sir Miles Irving.—The Punjab is not seriously interested in rice. It is there grown as a luxury article. The finer forms are grown in a few favourable localities. Commercially, we cannot say that we are seriously interested in the production of rice.

Dr. W. Burns.—In Bombay Presidency proper excluding Sind, out of about 29 million acres, there is something in the neighbourhood of 1,900,000 acres under rice, and we produce about 840,000 tons of rice. But in addition, there are imported into Bombay about 255,000 tons of rice by coasting vessels which come into Bombay. That figure includes not only Bombay Presidency but also Sind. But even assuming that only half of that comes into the Bombay Presidency, it is obvious that our own requirements are not nearly made up by that which is produced in the Presidency itself.

Mr. W. J. Jenkins.—As far as Sind is concerned, the position at present is that we are more or less supplying our own internal requirements. The present acreage under rice in Sind is roughly a million acres. Half of this area is grown on the Lloyd Barrage Canals, mainly the Rice Canal.

and half on the old inundation canals in Upper and Lower Sind. The development of the area under the Lloyd Barrage will not make any appreciable difference to the acreage under rice in Sind. The total increase of rice area with the full development of the Barrage lands will not be much more than a lakh acres. Small amounts of rice are exported from Sind. These exports went mainly to the Persian Gulf, and Red Sea ports but they are now being supplanted by direct exports from Calcutta and Rangoon. The rice question is not of great importance to Sind and, as I have already stated, the position is that we are more or less self-supporting with regard to this crop.

Chairman.—What is the area which will be brought under rice when the further expansion of the scheme takes place ?

Mr. W. J. Jenkins.—In the present year, there are about five lakh acres under rice on the Lloyd Barrage Canals and with the final development of the Barrage areas, it is estimated that there will be just about six lakh acres under rice. This is out of a total area of rice in Sind of about one million acres.

Mr. D. L. Drake Brockman.—All the information we have goes to show that our needs are in excess of our production by something like 400,000 tons per annum. We import roughly that quantity, mainly from Burma.

Mr. A. McKerral.—Burma is the only province that has got over-production of paddy and rice. She produces about seven to eight million tons of which about a half is used by internal consumption and about a half is exported. Of the amount exported, about one million or a slightly over one million tons are at the present moment going to India. As everybody knows, this trade has been in existence for many years, Burma acting as a granary for India in her years of drought and deficiency. The trade I think is very advantageous to India, as it is to Burma, and so far as I can see there is not much prospect of the amount of rice produced in Burma exceeding Indian requirements. The population of India during the last decennium, increased by slightly over 33 millions whereas the acreage under food-grains for the whole of British India fell from 205 millions in 1921-22 to 203 millions in 1930-31.

If the acreage of cultivation under foodstuffs had gone up in proportion to the population it would have been 237 million acres, that is an increase of 22 million acres. Unless the decline in the acreage has been accompanied by an increase of production there is no reason to suppose that the present figures of cultivation would meet the demands of India, and India must take rice from Burma for an indefinite period. The only question which we might perhaps consider is whether in Burma itself there is a tendency of putting too much land under rice. So far as I know the Government has no big project of irrigation and of course the other accretions which come from jungle and disafforested areas are almost impossible to estimate. During the last decennium, one million acres were added to the acreage of rice in Burma. I should not have believed it if I had been told then and I very much doubt if at the end of another 10 years another million acres will have been added to the rice area in Burma.

Chairman.—May I ask whether Burma finds the present price of rice satisfactory ?

Mr. A. McKerral.—No, Sir. We do not find the present price satisfactory. The price has fallen during the last few years by 60 per cent., which has seriously affected both the landlord and the Government.

Chairman.—We would like to know what Burma considers as the extreme limit of fall of price, at which stage Burma would consider it necessary to take up the question of substitution which really means how much is the next possible crop less paying as compared with rice.

Mr. A. McKerral.—Our difficulty in Burma is that the great bulk of rice is grown in lower Burma under rain-fed conditions, that is to say under rainfall which usually exceeds 100 inches and may come up to 250 inches. So far as I know there is no other crop that can be grown on those areas except rice, except along the banks of streams where you may get small areas which would grow sugarcane and possibly jute and maize. But we cannot consider the crops possible in these areas as a serious commercial substitute for rice. On our canal areas of course we can do more. Some of them are suitable for sugarcane and I gave the figure to the Advisory Committee of 100,000 acres as the maximum which we can reach if we substitute sugarcane for rice. We have one sugar factory in operation, another is being built and a third is under contemplation. As for other crops I am afraid I cannot think of any because the price of most of these crops has fallen in almost the same ratio as the price of rice.

Chairman.—What is the difference in the cost of production of Burma rice as compared with that of Bengal rice ?

Mr. A. McKerral.—I cannot say on the spur of the moment.

Mr. M. Vaidyanathan.—We had some information from the Burma Government. The cultivation costs about Rs. 20 per acre of irrigated rice in Burma and in Madras it ranges between Rs. 35 and Rs. 90.

Chairman.—So Burma has natural advantages which render the production of rice much cheaper than elsewhere.

Mr. A. McKerral.—The point is that the population of Burma being too small to consume the total production a surplus of slightly over 3 million tons is available for export. This the Burma producer must sell at the best price he can get. The cost of cultivation in Burma must be higher than in the rain-fed areas of India because the wages of labour are higher in Burma. They are nearly double what they are in Bengal.

Chairman.—Are you quite sure that this idea of substituting sugarcane for rice is in the interest of the crop planning or is it the desire for being self-sufficient ?

Mr. A. McKerral.—It is mainly in the interest of the cultivators that sugarcane is grown. If the cultivator can get Rs. 10 to Rs. 12 per ton of sugarcane, he makes about Rs. 100 per acre whereas if he grows rice he will get according to the Burma measure 30 baskets for which he will get only Rs. 15.

Chairman.—Is sugarcane more profitable than rice ?

Mr. A. McKerral.—Yes.

Chairman.—Will it not then replace certain amount of sugar which Bihar and Orissa is producing when these three factories are set in full working order ?

Mr. A. McKerral.—Certainly. At present we import from Java. About five years ago we were importing 40,000 tons but now it has fallen considerably.

Mr. D. R. Sethi.—We have on an average about 13 million acres under rice. We produce just a little less than five million tons of clean rice every year and inspite of this we are a deficit province and have to import about 80,000 tons from Bengal, so that in Bihar and Orissa there is no over-production of rice.

Mr. C. R. Pawsey.—As far as Assam is concerned there is no over-production and this is chiefly because of the large tea garden population all of whom are rice eaters. In Upper Assam there is always a deficiency and in parts adjoining Bengal there are occasional floods when we have to import rice from outside. In addition our land revenue assessment is based on the rice producing capacity of the land and during the currency of the settlement I do not think it would be possible to insist on any limitation of the area to be sown.

Mr. J. H. Ritchie.—In the Central Provinces the area under cultivation is roughly 5½ million acres and except in very good years that is just sufficient to feed the population ; while in years of good crops there is a certain amount of export to contiguous parts of the country. We have a steady market in Central India, in United Provinces, in certain parts of Bihar and Orissa and in the Nizam's Dominions. From the statistics I can say that Central Provinces is just self-supporting.

The Hon'ble Sir Frank Noyce.—Perhaps it would facilitate our work if the Imperial Council of Agricultural Research could give us some figures of the relative fall in the value of the agricultural products with which we are dealing now.

Mr. M. Vaidyanathan.—I have given the statistics in the book entitled " Statistics and graphs " at page 10. I have tabulated the principal crops, and compared their present prices with the average for three years ending 1929-30. From the table it will be found that tobacco seems to be most fortunate and most of the food-grains have fallen in price between 40 and 60 per cent. This table gives the relative fall in prices of the several agricultural products.

The Hon'ble Sir Frank Noyce.—It seems to be clear that rice has fallen almost more than anything else.

Mr. M. Vaidyanathan.—It seems to be so.

Dr. D. B. Meek.—1873 Index No. ; that is the base.

Average of ten years ending 1929.	In February 1934.
Rice, 133	62.2
Jute, 112	41.5
Raw cotton, 138	67
Wheat, 169	81
Oilseed, linseed, 157	79
Rapeseed, 134	67
Sesame, 143	55
Poppy, 134	77
Gram, 175	85
Sugar, 283	134
Tea, 162	164

Col. A. Olver.—Have you got the figures for butter ?

Dr. D. B. Meek.—Butter does not come into the index as far as I remember, but we could get the price of imported butter for those ten years. I could get you the price of ghee.

Chairman.—I think we had better stick to rice for the present. Now, at page 7 of the Note the Committee arrived at the conclusion that there was no over-production of rice either in India as a whole or in any part of it. That is now open to discussion.

Rao Bahadur C. Tadulinga Mudaliar.—May I suggest, Sir, that as there is no definite data with regard to the quantity of rice consumed by the people a census of the rice-eating population of the various provinces be arranged to be taken so that we may have definite figures on the subject for future guidance.

Chairman.—There is going to be a Provincial Committee, and that will come under provincial marketting, and it will be included in that.

Rao Bahadur C. Tadulinga Mudaliar.—Then that will be all right.

Chairman.—Now, is the conference prepared to endorse this conclusion ?

Rao Bahadur Narasimha Raju.—Just now it was stated that Burma over-produces rice, but now it is recorded here that—' it was agreed by the said Committee that there was no over-production of rice either in India as a whole or in any part of it.' I doubt the accuracy of the last portion. When Burma admits that there is over-production as far as that province is concerned, I don't think the fact has been correctly stated in the statement by adding the words at the end ' or any part of it '. From the statement supplied to us, it is clear that Burma produces over 7 million tons of rice. It was said just now that she consumes half of it. In some other place it was stated there is an exportable surplus of 3½ or 3¼ million tons of rice in Burma. Therefore, if you are to judge the production of provinces by their consumption, and when there is a surplus in a province, it will be better to call that province an over-producing province. If we proceed like that, we will be in a better

position to judge the situation. Now, when there is over-production in Burma to the extent of 3½ million tons, and the quantity which the rest of India imports from Burma is only one million tons, there is yet a surplus of 2¼ or 2½ million tons of rice in Burma. The question then arises whether this surplus will be absorbed in the Empire or outside the Empire. If it can be absorbed within the Empire, then from the figures supplied to us by the Statistical Department we find that the quantity of rice consumed by Ceylon, British Malaya and other parts of the Empire comes to 2 million tons or something like that. Therefore, as far as Burma is concerned, even making a liberal allowance for import of Burma rice into the British Empire, there will still be a surplus, and in Burma's neighbourhood we have got the Indo-China and Malay States which are producing large quantities of surplus rice. According to the figures supplied to us, it is stated that the surplus in Siam is in the neighbourhood of 3,864 million pounds, which when converted into tons, comes to about 1 million 7 hundred thousands tons. In Indo-China the surplus is 2,760 million pounds, and this when converted into tons comes to about one million one hundred thousands tons. Therefore, there is a surplus of nearly three million tons of rice in Siam and Indo-China. The question that has now to be tackled is, what is to become of this surplus rice in Indo-China, Siam and Burma,—and the total surplus comes to nearly 6 million tons. Even according to the figures furnished, the total quantity of rice that was imported into other countries in the year 1930 or 1931 is 2,195 thousand tons. Therefore, if we take all the figures together we find there is yet a surplus of 4 million tons or more in the rice exporting countries of Burma, Indo-China and Siam. The matter needs very careful consideration by this conference as to how to dispose of the extra two million and odd tons of rice from Burma. It will not be wise, I think, to record that Burma has no surplus of rice production.

Chairman.—I don't suppose it was intended that over-production means production in excess of local consumption. I suppose over-production meant that at the end of the year there was something left over.

Mr. A. McKerral.—When I spoke of over-production in Burma, I used the word in the sense in which the representatives of other provinces of India have used it, namely they have no excess after the wants of their people have been met. Over-production in Burma does not mean that she is left with a large stock on her hands.

Chairman.—But is the world producing too much rice or more rice than is needed ?

Mr. B. C. Burt.—From the figures supplied by the International Institute, we consider that from 1933 onwards the world is over-producing rice; that is to say, the rice production of the big rice consuming and rice importing countries like Malaya, Ceylon, China, is increasing. Every number of the International Statistical Bulletin for the last 3 months has referred to the contraction of the Far Eastern Market, which means that Burma, Siam and French Indo-China, the three great rice exporting countries of the world, are finding it increasingly difficult to market their surplus. The last number of the Bulletin refers to the fact that Burma is in a better position than Indo-China and Siam, because they have been able to send much more rice to India because of the smaller Indian crop, that Siam also has sent more than hitherto and that French Indo-China is in the worst

position. There is a definite indication that since the harvest of 1933 the world position has definitely deteriorated.

Mr. C. G. Wodehouse.—So far as the surplus in the main producing countries like Indo-China, Burma and Siam is concerned, I think I am correct in saying there has never been a large carry-over until the new crop. The figures, according to my information, would not exceed half a million tons at the end of any one year which is a very trifling quantity compared to the amounts actually at the disposal of those three countries. The suggestion that there is over-production of rice seems to have arisen from the fact that there has been some decline in the overseas trade of rice from India. Admittedly there has been some decline. The reasons for that can be briefly stated in two main heads. In the first place, as we shall come to later in our agenda, there have been various restrictive measures taken by foreign countries some of which are detailed in the note circulated, and there are others which might be mentioned. That to some extent accounts for the decline in the exportable quantities marketed in foreign countries. There is again the other main head, and that is there appears to be very definite evidence that the quantities of rice required by India proper are tending to increase. This may be caused, I think possibly very largely caused, by increase in population. There may have been seasonal factors, such as shortages of crops in some areas, and possibly the low price may have accentuated the consumption. But my point is that as regards the Burma surplus that we are now discussing the amount that is available for the overseas market is limited by the extent of the amount that other provinces in India require to draw on the reserves that are available in Burma. The exports, I call them exports, the amounts taken by provinces in India from Burma, are showing a tendency to increase. The available figure of the surplus in Burma is estimated this year to amount to 3,200,000 tons. It may be of interest to give the figures of actual exports up to the end of May this year. Of that available surplus, 850,000 tons has already been marketed overseas to foreign countries. India has taken 1,100,000 tons already up-to-date. So that, out of that 3,200,000 tons, 1,950,000 tons has already been disposed of, which leaves 1,250,000 tons available for disposal between now and the arrival of the new crop at the end of December. I suggest that those figures prove quite conclusively that there is every possible chance that there may be even a shortage if India is going to continue to require such large quantities, and it would appear to be highly inadvisable, both in the interests of Burma and in the interests of India herself, that the available supplies of Burma should be in any way restricted or decreased.

Mr. H. M. Hood.—May I ask whether Mr. Burt has any information of the stocks of rice held in the various countries.

Mr. B. C. Burt.—No Sir. There are no figures of stocks of rice as far as I know, except stocks in warehouses at ports. That is the great difficulty in calculating what the exportable surpluses are. Mr. Wodehouse can perhaps tell us what the Rangoon stocks are, but I think he will support me when I say that there is no information about up-country stocks. I know that the international Institute has said that there is practically no information about up-country stock in Indo-China or Siam, and of course there are practically no statistics at all for China.

Mr. C. G. Wodehouse.—We are in a position to estimate very closely stocks carried forward at the end of any one year, if that is the point you are referring to.

Mr. H. M. Hood.—The point is that if there is over-production that the world stocks ought to increase.

Mr. B. C. Burt.—Those, Sir, will be largely invisible stocks in the hands of the cultivator, of which we get no figures.

Chairman.—So far as the point under consideration is concerned, that is simply that objection was taken to the statement of the sub-committee that there is no over-production of rice in any part of India. This is a drafting matter and would Secretary kindly note that the phraseology of this conclusion is to be modified to indicate that over-production does not mean excess over local consumption but means that there is no stock left in the province of origin, the whole being disposed of. What we have been discussing in part is really the proposition decided by the committee by a majority which reads as follows :—

> "That in view of the present world conditions in the matter of rice production, no Provincial Government should ordinarily offer any stimulus to an increase in the present area under rice."

That is really the proposition ; now, which province would like to father this proposal ?

The Hon'ble Sir Frank Noyce.—I notice that five provinces object to this proposition. I should like to know, since they disagree, what stimulus they have been offering or propose to offer ?

Chairman.—Let us first hear from those provinces which would like actively to promote this proposition.

Mr. H. M. Hood.—As far as Madras is concerned, Sir, provided that a fairly liberal interpretation is put on the word "ordinarily", we would not oppose this resolution.

Chairman.—I am at present on the look out for some one who would father it, not for such half-hearted support.

Mr. H. M. Hood.—I understand that the original position was that the resolution was moved by Dr. Burns but the word "ordinarily" was put in on Mr. Raghaviah's instance. Perhaps Dr. Burns will support it.

Dr. W. Burns.—I would like actively to support this proposition, because there is no thought of restriction. It is not a question of reduction ; it is only a matter of sounding a note of caution and saying 'do not go ahead too fast'. The position has been very clearly explained. We cannot take into consideration the position without considering the world situation, and it is the world situation which controls the price of rice. Mr. Burt read to the Crop Planning Committee, the advisory sub-committee, a passage out of the International Review of Agriculture which is so pertinent that I take the liberty of reading it, it is quite short :—

> "Demand in the Far East remained rather slow in February. The apparently good production in China, the prospects of a good crop in British Malaya and in the Netherlands East

Indies and the large crops in the Japanese territories make the market prospects in this direction very poor.

"In the three major exporting countries together there has been a slight increase in production in 1933-34. Their joint export surplus, taking into account old crop carry over, is also somewhat above that of the previous season. While the market position in Far Eastern countries appears to have deteriorated, the small crop in India has greatly alleviated the situation of the exporting countries. While the exports from Rangoon to foreign destinations up to 24th February diminished from 424 million pounds last year to 276 million this year, those from Rangoon to India upto the same date, with the addition of the exports from smaller ports upto 17th February, rose from 410 million to 550 million pounds. Total exports from Siam upto the end of January were 18 per cent. larger than in the same month last year, due also to much larger takings by India. The position of Burma, thanks to the large Indian deficiency is thus relatively satisfactory, that of Siam, though so far also greatly assisted by the strong demand from India, and that of French Indo-China, with its increased production, less assured, much depending on the size of the as yet rather undefined crop in China."

The point is that there is a very definite danger of a surplus and we cannot in view of that definitely encourage extension of rice production in India or in Burma. Therefore I most heartly support the motion, for which I voted in the sub-committee, and would commend it to this full Conference.

Rai Bahadur B. B. Mukharji.—The fact that this resolution took such a long time to find a sponsor goes to show that the persons who put it forward were not quite convinced of its necessity. The last speaker has just told us about the international position, but I would make it clear that we are nationalists first and internationalists later. I want to support the proposition that it ought to be the look-out of India first and the provinces later that they must be self-contained. When this proposition seeks to put a restriction simply because the world production is greater. I from Bengal have got to see how far it affects me. If I find that my people, who are worthily or notoriously rice eaters, have not got the rice that we can produce, when we see that we can produce the finest rice in the world and when we can see that the province is supplied with all the gifts of Providence necessary for such production. I do not see why we should be put into this uncomfortable position of eating—though I am very thankful to Burma—Burma rice which we consider to be inferior, and why should restriction be put on us to produce rice for our own consumption, rice which we consider to be best suited to us and which we can produce ? I can understand that if the world position deleteriously affects the price, we should be cautious. At the same time I cannot quite see why I should be left in Bengal in this uncertain position and why I should not take steps to support my own people with a produce for which the province is suited. I submit as a corrective to this resolution that, subject to a province being satisfied that its production can satisfy its own people, it ought not to go beyond. That is, I must first see that my people do get the rice of the

country and then I would have an eye on the total output of the world. If we are perpetually restrained from producing that which is necessary for our own consumption, I am afraid it will be a very unhealthy and undesirable position into which we will be put.

Chairman.—You would be satisfied if the Burma variety of rice improved ?

Rai Bahadur B. B. Mukharji.—Quite true. My position is this I do not really see why Bengal should not be self-contained. I am not speaking anything against all India ; but I do think that it is a sound economic proposition—a proposition which has been demonstrated to be sound by the late war—that a country should be self-contained in the matter of essential foodstuff. I do not want to declare war against any other province. I do think that in my self-interest the production of my essential food crop should not be so restrained that in time of distress or in time of want I should have to look to somewhere else or let my people go with empty stomachs, specially when I have been favourably endowed by providence with suitable land, with suitable capacity, with suitable varieties—probably you are aware, Sir, that one of the experts had stated that we evolved about 400 types of paddy.

Chairman.—Apparently during the last few years the cost of production in Burma is lower than in Bengal.

Rai Bahadur B. B. Mukharji.—But, Sir, it is inferior stuff. With all respect for Burma I submit it is inferior stuff. If you ask a Bengalee to have a guest and then give him Burma rice, he will never return to the house any more.

The Hon'ble Sir Frank Noyce.—May I interrupt Mr. Mukharji ? I should like to ask him how he expects Burma to take Bengal jute to the value of Rs. 1,17 lakhs per annum unless they export some rice to pay for the jute. Would it be entirely to the advantage of the Bengal cultivator if Burma ceased to import Bengal jute ?

Rai Bahadur B. B. Mukharji.—I would in fairness to Burma say that if they can have a substitute for the thing we produce they are perfectly welcome to use it. We produce a thing which they cannot produce. Not out of charity but out of good-will we tell them " Take this, it will serve your purpose ". I do submit that Burma rice does not stand in the same footing. Burma rice if it is to continue to feed us will only mean that we are restrained from producing excellent rice—if I may say without impertinence to Burma—in order to consume the coarse rice of Burma. We produce jute. Our cultivators go down in waist deep of water to produce a thing which they need. If you do not want it I do not want to force it on you. The position between our jute and their rice, with great respect, is very different. I would be quite willing to agree to such a proposition provided we are free to take any steps to be reasonably self-contained. We would then be perfectly willing to accept it.

Mr. A. McKerral.—In the note which I submitted to the Advisory Committee I tried to indicate the physical conditions which existed in Burma and in Bengal in order to show that some provinces can produce crops which other provinces cannot produce. We might say the same thing about Bengal jute as is generally said about Burma paddy. We might ask why we should not grow our own jute and so be self-

contained. The truth is we cannot grow jute, because we have not Bengal's climate and Bengal's soil. Therefore we exchange our paddy for Bengal's jute to the tune of about Rs. 2 crores and to me that seems a very fair arrangement. We must not forget that in addition to the financial and economic factors involved there are physical factors beyond which we cannot get.

Mr. P. B. Richards.—Before speaking from the point of view of the rice situation in the United Provinces, I wish to draw your attention to the fact that in the Vice-Chairman's note on the proceedings of the Sub-Committee the representative for Burma has not been included among the minority who voted against the resolution that no Provincial Government should ordinarily offer any stimulus to an increase in the present area under rice. Burma, Bengal, the United Provinces, Sind and the Central Provinces voted against this resolution. Now, Sir, these are the main rice producing areas. They cover, I imagine, something like 90 per cent. of the total rice raised throughout the Indian Empire, if Burma is included.

Sir T. Vijayaraghavacharya.—It is a clerical error.

Mr. P. B. Richards.—Then, Sir, if the Provinces which are really interested in the growing of rice do not desire these restrictions why should the Provinces which are not greatly interested in rice growing wish to enforce them. So far as the United Provinces are concerned the reason why this resolution should not be passed is two-fold. One is that our average acreage in the United Provinces for the last 10 years has been approximately 7 million acres. This year it was just under 6 millions. If we are not to encourage our cultivators to go back to their normal 7 million acres under rice, what are we to do? We should have to grow on one million acres some other food crop, if we could find one which pays us as well; and there seems to be no practical advantage in attempting to change one food crop for another even, if it were practicable to do so on rice land. The other reason, Sir, why this resolution as it stands is undesirable is that it precludes the utilisation of new canal schemes, which have been designed, in part at any rate, for the turnover from less paying crops to rice among others. The capital has been sunk, the canals are functioning and development is going forward. For the change-over from unirrigated to irrigated conditions, the cultivators must be trained in the proper use of water and in the change of rotation which is necessary. Consequently very active encouragement is required if these canals are to perform the function for which the Government have constructed them. If, therefore, at this stage it is laid down as a general principle which Government might feel itself in duty bound to follow, that no stimulus should be given to an increase in the rice area, then all its calculations in regard to its schemes—not new proposals but schemes already in running order—would have to be revised. This would seem to inflict considerable hardship upon just such Provinces as happen to be caught at this critical moment.

The Hon'ble Sir Frank Noyce.—In dealing with a Resolution of this kind, we should clearly define the terms. What is meant by stimulus. Does stimulus mean propaganda? We cannot imagine anybody here in the present world conditions advocating special propaganda.

Dr. W. Burns.—Stimulus does mean propaganda. It also means such a policy as putting new canal under rice. It also means putting disafforested areas under rice. Those three points were in our minds.

Diwan Bahadur T. Raghaviah.—With reference to Mr. Richards' remarks, this point was prominently before us and that is why I raised it and that is why the word "ordinarily" was used. In Madras costly irrigation schemes have come into existence and they have not reached their ultimate capacity. It was not our intention that anything should be done to prevent that ultimate capacity being reached in those cases. The idea in our minds was that no fresh large project for putting land under rice should be undertaken.

Rao Bahadur C. Tadulinga Mudaliar.—With due deference to the Sub-Committee who passed this resolution I strongly oppose it. Rice is the only crop which gives the highest revenue to Government at present. There are several schemes in Madras such as the Cauvery-Mettur, the Bhavani and the Tungabhadra. I am sure there will be a large acreage brought under cultivation. Out of 45 millions of the population, 50 per cent. are rice-eating population. And Madras is able to supply the rice requirements to only 16 to 18 million people. Madras is not producing enough quantity of rice for her own purposes. Therefore we should not be in a position to support this Resolution because Madras should after some time at least when her conditions improve be in a position to be self-supporting.

Chairman.—That you had better decide among yourselves. Different members representing Madras cannot express different views.

This has been a very interesting discussion bringing out very very pointedly the difficulties of crop planning in India. We have here more or less a number of autonomous provinces, each province feeling that it owes a duty to itself first and to India afterwards. That is the position taken up by Bengal. (*Rai Bahadur B. B. Mukharji* : Yes.) The position is not unreasonable. At the same time when we are expected to arrange crop planning for India, it must be realised that in securing the best possible result for India as a whole it will be extremely difficult in some cases not to so adjust things that thereby the interests of the province are not kept in view to the extent that they would be if Indian interests were not to be supreme. Is this crop planning with reference to each province or is it to be with reference to the whole of India ? It is very natural for all rice producing provinces to feel that as long as their own demands are not met there should be no restrictions placed in the way of their going on producing rice ; there should be no restriction placed on their producing such rice as they need. That is perfectly reasonable. At the same time we have to take into consideration the object which we have come here for. It is to reconcile the interests of provinces as far as possible, to see that India gets, as I said, the best value out of its produce. I do not know what the solution of this difficulty is and I should not be surprised if we do not achieve greater success than the World Economic Conference which met in London last year. Still there are lessons to be learnt. We will know the limitations on the power and authority of Government and also the readiness to sacrifice our own interests or provincial interests for the interests of the country as a whole. Now in face of the opposition from rice producing provinces to this proposal, is it possible for us to agree to a formula like the one which was enunciated by Bengal and a representative from Madras to the effect that rice producing provinces which are deficit provinces in the sense that their local demands are not

met by their production should be free to produce more till their demands are met ? Has Burma any objection to that formula ?

Mr. A. McKerral.—I can see no great danger to Burma from the adoption of such a formula because it is unlikely, as appears from the figures which I gave, that the Indian provinces will be able to support themselves for a very long time to come.

Dr. W. Burns.—I submit that the formula just now proposed is not a very great help because it seems to be a concession to the narrow provincial point of view which we must combat. It has been suggested by the representative of the United Provinces that the rice producing provinces voted against this while provinces which were not so interested in rice voted for it. Although the area in Bombay is a third of that in the United Provinces and a fourth of that in Madras, it does not follow that Bombay is not interested. In the last Legislative Council the member for Thana asked a question as to what was going to be done about the drop in the price of rice due, he said, to Burmese and other competition. That shows that the question is vital there still. I am not authorised to commit my Government in any way to any policy without examining it. I am judging this simply as a responsible representative and as a member of the Agricultural Department and as one who is in touch with provincial, Indian and international matters. It seems to me that the Resolution is so innocuous that I cannot see any objection to passing it in its present form.

Mr. H. M. Hood.—The present policy of the Madras Government since the slump in prices is caution in instituting irrigation schemes designed or likely to increase the rice producing area of the Presidency and examination of schemes designed to irrigate other crops. The Resolution as it stands goes much beyond that and compels the rice producing Governments not to increase the produce of rice at all. If the present area is not to be increased at all, then the Madras delegation could not agree to this Resolution at all. We could agree to such a formula as " provided that it should not go beyond the power of consumption in the province ". That is, I think, the intention of your suggestion.

Dewan Bahadur T. Raghaviah.—As one who was responsible partly for the Resolution I may say that we looked to the interests of India as a whole. In regard to Madras we were aware that Madras has spent a good deal of money on irrigation schemes for the production of rice and that is why we said " ordinarily " to save cases in which it was necessary to go on expanding cultivation. The idea was that no new large area should be brought under rice cultivation even in Madras. There may be special cases where on account of special factors it may be necessary to introduce rice into small new areas. Except in those cases the idea was that the cultivation of rice on new areas should not be encouraged and I do not really see that there can be any objection to accepting the proposition in that sense.

Chairman.—Will the proposal be acceptable to the Conference in this revised form ?

" That the present world conditions in the matter of rice production be borne in mind by provincial Governments which may be contemplating an increase in the present area under rice."

Mr. B. S. Kamat.—Even with regard to this revised formula what about the commitments which the Local Governments have already

made in irrigation projects? As my friend Mr. Jenkins pointed out, I think the Sind canal system contemplates that although the present area under rice may be 5 lakhs, in 1941 it is expected to rise to 6 lakhs. The whole scheme has been based on that commitment and I don't know how the Local Governments will bear the world conditions in mind if they are to be true to their commitments. We are agreed about the general principle that there should be no over-production within India in any province and in framing a formula we may say that there is no case in the opinion of this Conference for restriction of the present area. If we confine ourselves to that statement I think we go so far as we ought to go. We are now in the hands of Local Governments and we cannot advise them as to what they should do in future in respect of their commitments.

Rai Bahadur B. B. Mukharji.—As regards Bengal we have already accepted your suggestion and we do not think it will hamper us in any way. But I emphatically deny that I have been provincial at the cost of India. I have been provincial in the interests of India. The reason why I object is this that the proposition that was being called narrow provincialism was really one which meant a broad-hearted nationalism for India. I accept this proposition whole-heartedly.

Chairman.—Has Dr. Burns anything to say?

Dr. W. Burns.—I am afraid I have said all that I have to say at the moment. We are asked to refrain from positive action in propaganda or in putting new areas under rice. I do not see myself that this resolution as worded in the cyclostyled paper before you in any way interferes with present commitments, and I must say that this is the best thing that we can do. It is very mild ; it does not restrict the area ; it is an advice that there should be no definite pushing of future rice cultivation ; and therefore, with all deference to you, I would be inclined to stick to the proposal as it has been drafted by the Sub-Committee.

Chairman.—That is on behalf of Bombay?

Dr. W. Burns.—Yes.

Mr. A. D. Gorwala.—Bombay excluding Sind. We do not agree with the view that Dr. Burns has taken.

Chairman.—Will those who support Bombay *minus* Sind indicate by show of hands? There are two alternatives. We may pass a resolution or pass nothing. If the Conference prefers to pass nothing it is open to it to do so, or if it prefers to pass that mild form of resolution that was read out it is open to it to do so. Will those who support the formula read out indicate by provinces? (Madras, Bengal, the Punjab, Central Provinces, Sind, Bihar and Orissa and United Provinces indicated assent ; also Bombay in default of something more positive.)

Chairman.—Now we proceed to page 8 of the Note, that in view of the answer under (1) above no restriction is recommended and the questions under (2)A do not arise. Then we come to internal markets. As regards internal markets it was agreed that the development of internal markets was of great importance and that this development could best be pursued by means of the marketing scheme now under the separate consideration of the Imperial Council of Agricultural Research. As regards external markets the Sub-Committee made the following recommendations ; (i) that negotiations should be opened with Ceylon and British

Malaya with a view to obtain preference for Indian rice. Let me take this item No. (*i*).

The Hon'ble Sir Joseph Bhore.—The only observation that I would like to make in regard to this is that this question of preference for our rice in Ceylon has more than once engaged our attention. We are up against a difficulty there because Ceylon is quite prepared to consider preference to Indian rice but what she wants is some very special treatment for Ceylon cocoanut produce so far as this country is concerned. We are thus in a dilemma. However, I can assure the Conference that we shall bear this recommendation, if it is carried by the Conference, very carefully in mind in our future negotiations with Ceylon.

This item was unanimously agreed to by the Conference.

Chairman.—We now come to item No. (*ii*)—that as soon as financial circumstances permit the export duty on rice should be removed. That is a sort of demand which is very easy to make but not easy to meet. But is that one of the proposals on which the Sub-Committee was agreed ?

Dr. W. Burns.—There was one dissentient. That was myself. It seems to me that this is a duty which has been on for a long time—I have been told for over 70 years. A similar duty is imposed by the other two exporting countries Siam and Indo-China also and it does not seem to me that it is necessary at the moment to do away with what is a source of revenue to the Central Government. If we do away with the duty the foreign competitors may do the same and we shall be in the same position as before only with loss of revenue to the Central Government and nothing gained.

The Hon'ble Sir James Grigg.—I think the question of removing the export duty on rice at the moment is rather an academic one because the best part of a crore is obtained from it, and personally I do not see the Government of India being in a position to surrender a crore of rupees of revenue in the very near future.

Rai Bahadur B. B. Mukharji.—But that does not stand in the way of suggesting to the Government of India that we do think that doing away with the export duty would expand our market and help to create good will in the interests of India and that it should be adopted at the earliest possible moment.

The Hon'ble Sir Miles Irving.—The Punjab Government does not want to commit itself.

Mr. H. M. Hood.—The Madras Government are very anxious that the duty should be removed. During the course of the Economic Conference held a couple of months ago I think Sir George Schuster raised the point not that they could not afford to take the duty off and that they were badly in need of revenue, but that it was a very long standing tax. That was the point made then.

Chairman.—Dr. Burns' point was that it is a duty from which Indian exporters suffer along with exporters of other countries, and our leading the way to its removal may well be followed by others.

Mr. H. M. Hood.—If other countries have an export duty on rice and put obstacles in the way of their people exporting rice, that does not seem to be any reason why India should also have an export duty on rice.

Chairman.—The obstacles will just be the same as they are at present if they follow us in this good lead.

Mr. H. M. Hood.—That is true, but I think Sir George Schuster said that the position with regard to rice was precisely the same as that with regard to wheat, and there does not seem to be any export duty on wheat. Madras is anxious that this export duty should be removed.

Chairman.—There seems to be some difference of opinion as to the advisability of this particular proposal. If it is academic is it worth while proceeding to divide on it? If it is a matter of principle with some, expression of opinion of each Government ought to be enough.

Madras, Bengal, Central Provinces, Burma, were for removal. Bombay was not for removal. Punjab and United Provinces did not wish to make any recommendation. Sind had no instructions in the matter and did not propose to say anything. Assam had nothing to say on the subject. Bihar and Orissa was not interested in the subject.

Item No. (*iii*) of the Note : that the specific duty imposed by the Ottawa Agreement on imports of rice from foreign countries to the United Kingdom should be extended on paddy to the extent of three farthings per lb. Government will do their best to have this point carefully examined and see what can be done.

Item No. (*iv*), Part I of the Note : that Burma and Bengal which produced rices suitable for English and Continental markets should continue their experiments in the matter of improving the quality of such rices. We had a reference some time ago as to what can be done to improve Indian rice to enable it to compete with Italian and Spanish rice. The inquiry was circulated to all provinces and Bengal and Burma were the only two which held out hopes of doing something in that line. If the situation has changed since then and any other province hopes to enter the field of competition I should like to know. (No discussion) I trust these two will do their best to see whether any portion of the European market can be secured for Indian rice of superior quality.

Rai Bahadur B. B. Mukharji.—We undertake to do our best.

Chairman.—I understand from the Vice-Chairman of the Agricultural Research Council that a handsome grant has been given to Bengal for this purpose.

Rao Bahadur Narasimha Raju.—I see that Madras is omitted from this list.

Sir T. Vijayaraghavacharya.—Madras is not interested in this matter.

Rao Bahadur D. Ananda Rao.—I asked for information as to the variety required and the quantity required. I understand that the quantity required is a little over a million tons.

Chairman.—I dare say the Council of Agricultural Research will be very glad to get any further information that may be required.

Railway freights. I understand that the Railway Board are anxious that they should accommodate the needs of those who want revision of freights on agricultural commodities. They are anxious to consult agricultural officers in this connection. I suppose the Conference notes this with satisfaction.

Paragraph 3 of Part I of the Note. It would not be wise to impose any restrictions on the import of foreign rice into India. Later on

the conclusion arrived at is that an import duty at the rate of Re. 1-4-0 per maund and of 15 annas a maund on paddy might be imposed on foreign countries.

Sir T. Vijayaraghavacharya.—We want a moderate amount of duty that will not produce retaliation.

Dr. W. Burns.—I find it exceedingly difficult to express any opinion on this subject, I have not consulted my Government and I am expressing here my own opinion. We are trying to raise prices at the present moment and I do not see any reason why we should not adopt the same procedure as in the case of wheat.

Mr. C. G. Wodehouse.—I would suggest that instead of the word 'foreign' we might say 'non-Empire' countries.

Chairman.—If this duty is to be like the wheat duty, then that is applied to wheat coming from any country other than India. It was really meant to fight Australian wheat.

Sir T. Vijayaraghavacharya.—Both mean the same thing. It is well understood.

Mr. A. D. Gorwalla.—May we have figures of the imports of rice from Siam.

Mr. M. Vaidyanathan.—The imports from Siam and Indo-China from January—March 1934 amounted to 58,000 tons as compared with 8,500 tons during corresponding period last year.

The Hon'ble Sir James Grigg.—Is there not some absurdity in imposing an export duty and an import duty on the same commodity ?

Sir T. Vijayaraghavacharya.—This reform has been long put off on the ground of logic. The thing is now being really felt by the Madras Government. We felt that practical considerations must prevail over logic.

Mr. C. G. Wodehouse.—I can give later figures than those quoted by my friend. The actual imports from Siam into India in the last six months, that is to say, from December to May amounted to 150 thousand tons.

Mr. M. Vaidyanathan.—There has been some discrepancy in the figures furnished by the Burma Chamber of Commerce and those supplied by the Director of Commercial Intelligence.

Chairman.—Apparently this is a very important matter indeed. It is an administrative matter mixed up with financial considerations but I am sure that in view of the opinion of the committee, Government will take this into very serious consideration. In fact the subject was agitated by a number of members in the Legislative Assembly and the Council of State and has been under examination already.

The Hon'ble Sir Joseph Bhore.—I would like to endorse what the Chairman said and we will certainly look into this matter very carefully but I would like to emphasize the danger of duties such as this leading to retaliation in regard to our agricultural produce. That is a very serious question indeed and the possibility of retaliation has always acted as a deterrent to our taking action. We have been accused of delaying action in this matter. We have delayed action for a very specific reason, because there is a danger of retaliation. A duty of 33 and one-third per cent.

is by no means a light one. It is sufficiently heavy to call for retaliatory action from countries which are affected. At the same time I think we can give an assurance, not that the matter will merely be looked into but that it is actually receiving consideration at the present moment and is under reference to the Governments which are concerned.

Chairman.—This brings us to paragraph 4 of Part I of the Note--the unanimous recommendation of the Sub-Committee that it was desirable to have a standing committee of the Imperial Council of Agricultural Research, that the functions of such a committee which should be constituted under the rules and regulations of the Council should be advisory, that its constitution should be on the lines of the other standing committees of the Council, that it should be financed from the funds of the Council, and so forth. Are there any observations by members of the Conference ? I take this is agreed to.

The next point is that Madras desire that the import of rice from Burma should be subjected to a quota but other members of the Committee did not agree with them. Does anybody wish to make any observations ?

Rao Bahadur C. Tadulinga Mudaliar.—Some years ago Burma was importing about 750,000 tons of rice into Madras but of late I understand that they are importing over a million tons. If that goes on for a number of years and if they are going to increase their imports to two and three millions, what is going to be the fate of the rice-growers of Madras ?

Chairman.—But you are increasing your population ?

Rao Bahadur C. Tadulinga Mudaliar.—But we are not increasing our population with such rapidity (Laughter). Therefore, we may, at least for the information of this Conference, suggest that Burma limit its imports into Madras to 750,000 tons and not beyond that.

Chairman.—Do you make that suggestion in the interests of the rice-gowers of Madras ?

Rao Bahadur C. Tadulinga Mudaliar.—It is only a suggestion--it is left to the Conference.

Chairman.—The Conference would like to know whether this suggestion is intended to be put into operation if Burma agrees to it, or in spite of Burma's not agreeing to it, and, if so, in what way you would advise the Conference or Government to act ?

Rao Bahadur C. Tadulinga Mudaliar.—The Director of Agriculture will be able to explain the position.

Chairman.—What have you to say with reference to your desire that Burma should be limited to 750,000 tons of rice being sent to Madras and no more ?

Rao Bahadur D. Ananda Rao.—I would not fix any limit like that. I would say " any reasonable amount ".

Chairman.—And the " reasonableness " being left to Burma ?

Mr. H. M. Hood.—The " reasonableness " will I think have to be fixed by some agreement with Burma. What I was instructed to put forward was that there should be some limit to the amount of rice which Burma might import into Madras.

Chairman.—Madras is free to export any of its commodities to any Indian province it likes ; and therefore if any province moves the Government of India to restrict the rice of Madras, that will have to be done by agreement with Madras or by the Government of India taking powers to enforce its decision on Madras.

Mr. H. M. Hood.—The intention was of course this. A great deal of rice is coming into Madras from Burma, and if it could be restricted, there would be some chance of getting the price of Madras rice raised. That is the object of the whole thing. Of course, I can see that there are serious difficulties.

Chairman.—You do not think that on the whole the Sub-Committee was right ?

Mr. H. M. Hood.—I do not wish to press this matter further now, Sir,—I should prefer to leave it to the Government of Madras to make further representations to the Government of India if they wish to do so.

Chairman.—Is there any other point relating to rice which members would like to take up ?

Mr. A. D. Gorwala.—I would urge that it be noted that where the alteration in railway rates affects the movements of rice of another province, both the provinces or all the provinces concerned should be consulted ; for instance, if two provinces are competing in the same article, then, if you alter the rates from one place to a port, it is going to affect the marketing of the other province. Consequently the other province should also be heard and its objections noted before the Railway Board comes to any decision. That is all I want.

Mr. N. D. Calder.—Yes.

Chairman.—Coming on to wheat (Part II of the Note) is there any province which is prepared to sponsor the proposal on page 9 that, keeping in view the world position as regards the production of and trade in wheat, it is undesirable that the area under wheat in India as a whole should exceed 33 million acres ?

Mr. P. B. Richards.—Speaking in my private capacity and not in any way committing my Government, I wish to draw attention to the possibilities which might have arisen in the past season. The United Provinces, normally, has a wheat crop of about 7 million acres. In the current season its wheat area was some one million one hundred thousand acres above the normal. Somewhat similar, but not to quite the same percentage of increase, was the case with other wheat producing Provinces. It is a fact that our wheat production this year is expected to be about the normal, but that is a accident. Had it not been for frost and heavy rust attack and dry hot winds, there would have been a bumper crop in the United Provinces. There would have been a bumper crop in other areas also, and, instead of, so far as India itself is concerned, a crop which she could reasonably expect to consume, there might well have been a crop very much in excess of Indian requirements. The figure of 33 million acres was based upon average yields and estimated average consumption. I would not press for any motion by this Conference upon the proposal which was turned down by a majority in the Sub-Committee, but I do think it desirable that Provincial Governments and Provincial Departments of Agriculture should, so far as it is in their power, endeavour to limit their wheat production within the total figure proposed in the resolution.

Chairman.—Have you any figure in mind as to estimated consumption ? So far as the estimated area under crop is concerned, your estimate is subject to verification ? So far as the estimated consumption is concerned, is there any basis for the estimate ?

Mr. P. B. Richards.—Since the cessation of rail and river-borne trade returns, it is only possible to guess, but it appears that in a normal year the United Provinces is able to export something like two hundred and forty thousand tons to deficit Provinces which have been able to consume it without difficulty and without any local depression in prices.

Chairman.—Is not the estimated consumption on the basis of some price the lowering of which price may lead to increased consumption ?

Mr. P. B. Richards.—That is a matter upon which I am not competent to pass any opinion ; that is a matter for economists.

Chairman.—In other words, is it contended that all who want to eat wheat at the prevailing price get it and are able to buy it ?

Mr. P. B. Richards.—All who want to eat wheat at the prevailing prices get it to the extent that they are able to buy it, but not all to the extent of their bodies' satisfaction. If it were cheaper, there would probably be greater consumption ; but the attitude which was adopted in the Sub-Committee was that we must consider economic prices as well as the well-being of humanity.

Chairman.—In case that proposal is adopted, how many millions of acres would United Provinces take off from two millions ?

Mr. P. B. Richards.—We have been in excess by 1,100,000 but as to how it would be possible to induce the cultivator, I cannot say.

Chairman.—Your basis of reduction provincially would be the percentage on the area under wheat ?

Mr. P. B. Richards.—It seems that the United Provinces is responsible for about half the increase in acreage of the past year. I would be prepared to recommend to Government to take every possible step to reduce the acreage to normal.

Mr. W. J. Jenkins.—" The supporters of the resolution advocating restriction of the wheat area in India have endeavoured to establish a relationship between the total acreage of wheat in India and the internal consumption. They have pointed out that, owing to the import duty, there is at present no export for surplus wheat produced in India as the price in India is so much above world parity. They recommend restriction in view of the possibility of larger crops in future and the consequent effect on prices. But there are two sides to this picture and it is quite possible that we might have one or more bad years in the future when the wheat produced in India would not be sufficient for internal consumption. In addition, it is quite possible that a revival of the wheat export trade may occur in future. Accordingly, I consider it an extremely dangerous thing to lay down any kind of restriction on the area under wheat in India as it is one of the most important food products of the country ".

The Hon'ble Sir Miles Irving.—I think the point should be made clear as to what we mean by our standard of consumption. Does it mean what people would like to eat or what they have the money to pay for. In point of fact if you take a ton of wheat as food for a family of four people it

would work out that the present wheat crop would feed only 44 million people out of a population of 350 millions in India. It has also been proved that the dietary of non-wheat eating countries is not so good as that of the Punjab and it would benefit people as a whole if the eating of wheat were extended. In fact Punjab would like to have a campaign to " eat more wheat ". We are prepared to supply wheat at a reasonable price. The whole question before us in the Punjab and probably all over India is the question of price. Whether the supply has affected the prices very much I rather seriously doubt but the prospects of a bumper crop undoubtedly have some effect on the market, but depression does not seem to bear a strict proportion to the fluctuations which arise from other causes and to my mind this factor does not seem to have been calculated. There are also interesting figures in the Punjab which show that in the Punjab alone the cultivation of wheat has decreased proportionately to the total crop of cereals. Twenty years ago on a five years average the cereals were 75 per cent. of the total crop, we have now 70 per cent. Wheat used to be 3.16 of the total crop but it is now 3.06 and at the same time if you take the graphs of wheat production and population, the population has outstripped in the Punjab the consumption of wheat. Therefore, I think it is very unsafe to say that we have come to the end in India of what is a reasonable amount of wheat we ought to grow. The problem lies in other directions in finding out how the purchasing power of the people could be improved.

Mr. B. C. Burt.—I submit that the position of wheat is a special one in this way that for several years the Government of India has maintained a deliberately artificial price for wheat by means of an import duty which has definitely prevented the country from exporting any surplus because of the high internal price. The import duty cannot be effective in maintaining the internal price if you get an unmanageable surplus. Those who support the proposal have placed the maximum consumption under present condition at 9¼ million tons and that is an optimistic figure, arrived at from the average during the last three years. In 1929-30 we had a record crop of 10½ million acres and early in 1930, the Commerce Department and the Research Council made independent calculations of the internal consumption of wheat from a consideration of the import and export figures and the crop figures. This was possible because we were able to deal with a series of years at the start and end of which stocks were clearly at a minimum because there was a change over from an exporting to an importing position. That calculation gave a figure between 8.5 million tons and 8.8 million tons per annum. Both departments were agreed on that figure. That was over a prosperity period. Following the large crop of 1929-30 and of course Russia's eruption into the world wheat market, there was a tremendous fall in prices. There is no question at all that we have been able to absorb during the years that have followed 1930 something very close to 9¼ million tons. There is no indication that the 10½ million crop was not absorbed gradually as the fall in prices passed away when the import duty came on ; the crops which have followed have been between 9 and 9½ million tons. The estimated consumption of 9½ million tons per annum is confirmed by the consumption calculated by the Statistician to the Research Council from population changes and assuming a straight line trend giving an annual increment of about 90,000 tons per annum. But there is this further difficulty. In 1930-31 wheat prices had fallen sharply but labourers wages were still high. Wages are now beginning to fall and the stimulus to increased consumption of wheat which is one of the superior food grains must gradually disappear.

There is now an organised attempt to bring down the rates of urban labour and agricultural labour has fallen. Far from assuming that our consumption of wheat of 9½ million tons will increase by 90,000 tons a year there is every risk that it might slip back. Therefore it was quite a generous figure that we took. Now it is estimated by our statistician, from the same calculations, that present stocks of wheat in India amount to some 600,000 tons. This may not seem much for a country like India producing and consuming 9½ million tons of wheat annually but my own feeling is that in March last stocks were as large as the wheat trade in India considered healthy. If we look at the course of prices, we see that wheat prices fell sharply as soon as there was a prospect of a really big crop, *i.e.*, as soon as the Government figure for the wheat area was known. Trade estimates are from 2 to 3 weeks ahead of the Government forecast for the simple reason that they get immediate reports from which they make up their own forecast as to what the position will be. It was not until the effect of frost and cold and the unseasonal cloud during the last month of the crop became obvious that prices began to recover. That seems to me a clear indication that the wheat trade in India considered that we had reached the danger point and that with a record area of 35 million acres were likely to have an unmanageable surplus. This acreage on reasonably average yields would have given a crop of 11 million tons and with export closed in addition of over a million tons surplus to a carry over of 600,000 tons would have been a serious problem. Therefore I think it would be wise to limit our wheat production to 33 million acres in itself a generous figure because the bumper crop of 1929-30 was 10½ million tons on an acreage of 31.6 million acres so that there is a very big margin in hand. While I have every sympathy with those who would increase the consumption of all cereals by all classes of population, we must not forget that if wheat prices fall the man who would go hungry is the cultivator because in all the major wheat producing provinces a certain amount of wheat has got to be sold to pay rent, irrigation dues and the like. If prices fall the quantity which he has to sell increases and it is not the urban labourer who is likely to go short but the cultivator. I do think that when Government is taking special action to maintain internal wheat prices, it would be a great mistake on the part of wheat growers not to take full advantage of it by limiting the production of wheat to what is required for internal consumption. If we are going to depend entirely on an increase in consumption surely we ought to remove the wheat import duty and let prices slip down to world level and let all consumers benefit. Already protests against the import duty have been made in the Assembly against the wheat import duty on behalf of the wheat importing provinces. I do not think the wheat producing provinces can expect to have it both ways and I do think that some serious plan on the lines suggested by Mr. Richards is urgently called for.

Rai Bahadur B. B. Mukharji.—One point I wish to urge is that so far as Bengal is concerned the consumption of wheat has increased. As a matter of fact we are confronted with the solution of one of the most important national provincial problems as to how to arrange for the national diatetic. There is an organised movement carried on by the Students' Welfare Committee that wheat should be one of the main items on the diatetic. As a matter of fact our social habits are also changing. If I were addressing a conference wholly of Bengalis I would remind them of the adage and the question which used to be put whenever a person used

to go out for invitation whether ' chira ' came at the beginning or at the end, that is whether it was (chira) rice throughout or at the end. I am sure no one would care to go to a dinner if there was rice right through and even the cultivators are now taking a lead. There is a definite movement in Bengal for adding wheat as an item in the diatetic of the people. I think it would be very unfair if there be any embargo so as to make the price higher than what the ordinary consumer would be able to get at. And though as a wheat producing province we stand low and we would not object to what is good for India, I do submit that wheat is gradually gaining in importance as an item of diet, and if it comes in I would rather welcome it.

Chairman.—If there is nobody in support of the proposition on page 9, barring the Director of Agriculture of the United Provinces in his personal capacity, we may take it that it is dropped. We will now proceed to the second one.

Mr. A. D. Gorwala.—Mr. Jenkins informs me that he did not agree to the whole of this. He agreed that efforts should be made to substitute other crops for wheat but he did not agree that no fresh stimulus should be given to the expansion of wheat cultivation. As a matter of fact it is difficult to understand what fresh stimulus means.

The Hon'ble Sir Miles Irving.—I do not think this formula will be acceptable. This difficulty about wheat is very largely a matter of inter-provincial competition and the prospect of the Sukkur Barrage throwing in two million acres is a very serious matter. The Sind representative suggests that if anyone is going to restrict its wheat, the Punjab had better begin. I don't think competition on those lines between the provinces is going to lead to any fruitful results. We do not see any possible way of changing the course of cultivation in our canals more than has been done already. As I have pointed out the production of wheat in the Punjab is going down very rapidly on unirrigated lands. The trouble before us is what we are going to do with the extra 2 million acres that Sind is going to produce. I do not suppose any Government could really agree to the Resolution as it stands.

Mr. A. D. Gorwala.—The point at issue is the difficulty of finding a substitute for wheat. The fall in prices has not been restricted to any particular commodity. The general level of prices has dropped. It is a fundamental principle of economics that movements in general prices are primarily caused by monetary influences, and the mere substitution of one crop for another is not likely to have any effect on the situation. The farmer should find his just remuneration in the regularity of prices enabling him to reckon on a legitimate return equivalent to that accorded to other producers. Unfortunately the formulation and execution of such a policy is outside the power of the farming classes. In this matter, their fortune lies in the hands of statesmen and bankers who control the purchasing power of money. If, however, it is felt that the quantity of wheat should be restricted why should not the Punjab take action ? The Punjab is the nursery of good agriculture and it will be much easier for the experienced and clever Punjabi cultivator to switch over from one crop to another than for the Sindhi agriculturist, who is yet learning his work.

I cannot dictate to a farmer what he should grow. If I insist, then in case of failure, the responsibility is mine. Oilseeds is a new crop difficult to grow and much more easily affected by frost than wheat. The responsibility of insisting that the zamindars in Sind shall grow other crops rather than wheat—to the growing of which they have been accustomed for ages—is, in view of the prevailing prices and the uncertainty of the future, not one which any Government ought to undertake. Moreover, the carrying out of any such restriction programme is not practicable. With reference to the Resolution we will agree to the second portion that every effort should be made to substitute other crops for wheat. But as regards the stoppage of fresh stimulus to the expansion of wheat cultivation, if fresh stimulus means that the acreage under wheat is not to be increased, then we must respectfully object. Our Agricultural Department is, of course, placing facts before the zamindars showing the usefulness of various alternative crops. We are prepared to do all we can to encourage more profitable cultivation, but we cannot accept the policy of restricting wheat. We might perhaps be prepared to agree that in the future no new schemes shall be undertaken which are likely to lead to an increase in the wheat area, it being clearly understood that new schemes do not mean full development of existing projects.

Dewan Bahadur T. Raghaviah.—The idea was the same as in the case of rice that no fresh irrigation project or fresh canal should be constructed which will have the effect of increasing the area under wheat. About the existing areas they could increase to their maximum capacity.

The Hon'ble Sir Miles Irving.—Punjab must oppose that. It has one or two projects that may possibly be taken up and they would inevitably result in a certain area being placed under cultivation, and the Punjab Government could not agree to an embargo of this description.

Mr. J. H. Ritchie.—Central Provinces is not concerned with this. We are not likely to start any irrigation projects. There is no irrigation project at all in the Central Provinces. The area fluctuates from year to year according to the soil at sowing time.

Mr. P. B. Richards.—In principle I support this ; but in the course of the discussion in the Sub-Committee, the question arose whether small minor projects were included such as the September flooding of comparatively small areas in which rainfall was in defect. One would like to see such small projects excluded. Over precarious tracts, it is under consideration whether surplus canal water cannot be utilised to make good defects in rainfall in order to prepare them for wheat or other rabi crops. I would like the resolution to be a little less rigid if it is likely to exclude investigation or actual operation upon such comparatively minor areas.

Sir T. Vijayaraghavacharya.—What is the limit of the minor area ?

Mr. P. B. Richards.—It may be only a matter of 5 or 10 thousands acres but as the resolution stands it precludes this.

Mr. B. C. Burt.—That is not a stimulus to fresh wheat cultivation at all. It is merely protecting the existing acreage.

Mr. P. B. Richards.—As long as that is understood I have no objection.

Dr. W. Burns.—We are on the horns of a dilemma. On the one hand the situation has been explained by Mr. Burt. On the other hand, we have the commitments of the Punjab and the Sind Governments which appear to indicate that there will be an expansion of wheat. I would like to quote again, if I may be tolerated, the following very apposite quotation from an article by George Pavlovsky published by the International Institute of Agriculture in their Monthly Bulletin of Agricultural Economics and Sociology :

" The prices of these products on markets so effectively isolated from foreign competition came thus to depend entirely on the relations between the home supplies and the internal demand, and the price level could be kept higher than in countries not so well protected. As an outstanding example of such price autonomy, one can point to the prices in wheat in Germany, France or Italy. In all these countries, and especially in Germany, the rates of general duties on wheat exceed more or less considerably the current prices of imported wheat in London and Liverpool, and other restrictions are also in force. In all these cases the wheat prices on the national market depend essentially on home supplies, and, unless there is over-production at home, they can be maintained at a level which makes wheat-growing remunerative. Yet, it cannot be said that the policy of autonomous price formation has generally succeeded in solving the agricultural price problem on the markets in which it has been applied. Indeed, though the level of prices has been maintained on a higher basis than in other countries, its gradual decline could not be prevented, and farmers continue to suffer from falling prices. This general tendency of the prices of farm products to decline is the natural effect of the all-round diminution in the purchasing capacity of the masses of consumers caused by the general economic depression which is itself largely due to the disintegration of the world market into isolated national economies ".

Sir, it seems to me that from the facts that have been placed before us, we may look forward to a further fall in prices.

Chairman.—I think we had better continue this discussion tomorrow.

The Conference then adjourned till 10 O'clock on Saturday, the 9th June 1934.

PROCEEDINGS.

Saturday, the 9th June 1934.

The Crop Planning Conference met in the Members Room of the Legislative Assembly Chamber at 10 a.m., the Honourable Khan Bahadur Mian Sir Fazl-i-Husain in the Chair.

Chairman.—When we adjourned yesterday the discussion was going on about wheat and the particular proposition, namely, no fresh stimulus should be given to the expansion of wheat cultivation in India, was under discussion. Objection was taken by the Punjab and Sind to that proposition and, if I am not mistaken, Bengal sympathised with that objection. It was at that stage that we adjourned. Discussion will now proceed from that stage.

The Hon'ble Sir Miles Irving.—May I somewhat amplify the position as regards this case. The position of the provincial representatives in this conference is somewhat difficult, as we are not in the position merely of giving advice but have to guard against our Government being bound to what we say, and therefore as the Punjab Government may see some possibility of schemes for producing wheat in the future, it is impossible to agree with the proposition that no fresh stimulus should be given to the expansion of wheat cultivation in India. But we want to put our cards on the table about this very important question of Sind and, if you like, also the proposed additions to irrigated areas in the Punjab. Supposing the wheat supply is now stabilised and it is proposed to market in the near future a very large supply from Sind, it will obviously be a disturbing factor. The Punjab proposes also to construct other works as, for instance, the Bakra Dam canal, which might not add to the area of wheat but which would certainly help the production of it. The Bakra Dam will substitute for one crop in three years of 5 maunds per acre a crop every year bearing 12 maunds.

Chairman.—In that case we might reasonably reduce the area. As Barani, it would produce nothing but wheat, while, as irrigated, it might produce cotton as well. You are now talking of what will happen at least 10 years hence.

The Hon'ble Sir Miles Irving.—I am rather guarding myself because I could not get up and say anything which would commit the Punjab Government in any way. But I am naturally thinking of Sind which affects the Punjab very closely and also the other provinces in India to a certain extent.

Chairman.—But the resolution is about 'fresh stimulus' and the interpretation put on it by the mover of the resolution was that in Sind the stimulus was given three or four years ago.

The Hon'ble Sir Miles Irving.—If that is the position, then, of course, the Punjab Government would say that we are helpless. We can only say that in order to meet the fallen price of wheat we should have to consider more remissions.

Chairman.—Nobody, of course, could say that. At that time wheat export by India was operating.

The Hon'ble Sir Miles Irving.—I am not blaming anybody.

Chairman.—Punjab would have required a rich neighbour to exploit rather than a poor neighbour.

The Hon'ble Sir Miles Irving.—I am only explaining the situation. As a matter of fact, our view is that as there is already enough land under wheat, it is time for Sind to think of something else.

Chairman.—That is exactly the question. Both the Sind speakers invited the Punjab to advise them if they could suggest any better crop than wheat which was equally good and as easy to grow.

The Hon'ble Sir Miles Irving.—Our suggestion to Sind is oilseeds. They have the market at their door.

Chairman.—That is going to be discussed later on.

The Hon'ble Sir Miles Irving.—On the question of stimulus, if Sind is putting these fresh acres under wheat, all we can say is that we cannot bind ourselves as regards our future measures of retaliation. We understand Sind's case sympathetically but we also feel that Sind now holds the position. By its action now, in the next few years it will enormously affect the wheat crop and the finances of the country, and therefore our hope is that Sind may find its way—even this Conference may find its way to advise Sind to take up some other crop than wheat.

Mr. A. D. Gorwala.—May I ask the Honourable Member from the Punjab what measures he proposes we should take to compel farmers to grow a particular kind of crop ? Can he do it in the Punjab ?

The Hon'ble Sir Miles Irving.—Now that you are giving out Government lands on conditions under the Colonisation Act, in the same way as the Punjab.

Chairman.—Colonisation in Sind is quite different from colonisation in the Punjab. In the Punjab, by far the largest area belongs to Government and Government gives away areas or sells or leases. In Sind, by far the largest area belongs to individual proprietors.

The Hon'ble Sir Miles Irving.—The position is very much the same as ours. There are probably no coercive methods ; these are methods of advice. I think it will be to the interest of the zemindar to cultivate oilseeds. Also, there are the methods of water rates and land revenue rates which may to a certain extent give the stimulus.

Mr. B. S. Kamat.—On the question of stimulus, I think this Conference ought to be satisfied if after the word " stimulus " we add some such words as : " but no fresh stimulus such as by way of major irrigation projects should be given to the expansion of wheat ". The object of making this explicit is to prevent Local Governments from going ahead with large irrigation projects. Personally I think it is not worth while for this Conference now to disturb the commitments which Local Governments already have accepted. Whether it is the Government of Sind or Punjab, it is exceedingly unfair to try to disturb those commitments and it would not be wise to do so. So, the whole object would be gained if after the word " stimulus " we add, " no fresh stimulus such as by way of major irrigation projects ".

Rai Bahadur B. B. Mukharji.—There will be a little objection from the Bengal Government to that, Sir. About 97 per cent. of our land only bears one crop. We are being charged by various public bodies that the Bengal Government is not looking after irrigation. You may remember the great controversy which took place a few years ago in the Press in which Sir J. Wilcox took part. They definitely charged the Government of Bengal with neglecting irrigation in Bengal. I may inform this Conference that there is now before the Government of Bengal an Irrigation Bill by which it is sought to raise money from the public or from the land benefited and construct irrigation works.

The Hon'ble Sir Frank Noyce.—You are not going to grow wheat under this ?

Rai Bahadur B. B. Mukharji.—Not definitely. If you mean irrigation works specifically for wheat, I am prepared to accept it. But if you say, " stimulus by way of all irrigation works ", then I do not agree. If it is intended that no stimulus should be given by constructing irrigation works specifically for the cultivation of wheat, I am prepared to accept it ; otherwise, it is very difficult for my Government to accept it.

Chairman.—May we have a statement from somebody as to what the prices of wheat are in the chief wheat producing countries of the world ? Prices in Indian Currency would be preferable ; otherwise in English.

(The statement was promised later on.)

Mr. W. J. Jenkins.—Sir, with regard to what Sir Miles Irving just said, I should like to make it quite clear that we in Sind are definitely attempting to grow substitute crops for wheat. I have the authority of my Government to say that they are prepared to co-operate with any scheme which would involve the substitution of other crops for wheat provided that these other crops are more paying. That is the most important proviso.

Chairman.—Or equally paying.

Mr. W. J. Jenkins.—We in Sind have very heavy obligations to meet, and we cannot assent to any proposal which is going to handicap us in meeting those obligations. I must respectfully point out that it is rather inconsistent for the Punjab representative to oppose this resolution on the ground that large irrigation projects in the Punjab may come to fruition in a few years and at the same time to ask us in Sind to restrict our area under wheat. It seems to me that these are two points of view which cannot easily be reconciled. With regard to substitution, we heard from Sir Miles Irving yesterday that the area under wheat in the Punjab is decreasing. [*The Hon'ble Sir Miles Irving.*—Proportionately.] It seems reasonable to suggest that it will be much more easy to substitute a crop which is decreasing than to substitute one which is increasing by leaps and bounds. We have heavy obligations to meet ; we cannot agree to anything which is going to handicap us in meeting those obligations.

Mr. A. D. Gorwala.—May we know something about the retaliatory measures which the Punjab proposes to adopt ?

The Hon'ble Sir Miles Irving.—Perhaps that was not a happy word. I meant the construction of further irrigation schemes.

The Hon'ble Sir Frank Noyce.—As regards irrigation projects, we are arguing an academic question. We are now dealing with an immediately

urgent problem. If you undertake fresh irrigation schemes, they are not likely to be completed for 5 or 10 years and the position then may have completely altered.

Mr. M. Vaidyanathan.—Sir, The Canadian wheat in Winnipeg sells at Rs. 2-1-9 per maund ; in New York the price is Rs. 2-2-6 per maund ; in Australia it is Rs. 2-2-0 per maund. In Liverpool the present quotation is about Rs. 2-8-0. For Argentine, the figure is not handy.

Chairman.—So far as the Punjab and Sind are concerned, their prices are below the price of wheat in any of these places. Therefore, the statement that the prices of wheat in India are being fictitiously kept up is not quite correct in the usual acceptance of that phrase. The only effect of the Wheat Duty Act is to protect Indian wheat from the onslaught of Australian wheat. But Australia does not sell wheat in Australia any cheaper than Punjab and Sind do in the Punjab and Sind. Australia has the advantage of cheap sea freight ; Indian has the disadvantage of expensive railway freight. So, I do not think there is much in that. We are producing wheat more or less at the same selling price in the country as other countries. But our situation and the vastness of the country do not permit of our being able to export. Now, what about this resolution ? " Fresh stimulus should not be given to the expansion of wheat cultivation ". In a way, it is more or less an axiomatic truth. In other ways, it is binding Government from starting upon any venture as a part of which expansion of wheat area may be involved. It may be considered as restrictive. Is it not possible for us to arrive at a formula which would serve the purpose ? What is our power over the provinces ? To give good advice. But till we have armed ourselves with the requisite legislative power, we could not force our advice on provinces. Can anybody suggest a formula which might serve the purpose ?

Rao Bahadur Narasimha Raju.—In the case of rice, the Conference adopted an advisory resolution for the provinces. I think the whole problem will be at an end if we adopt a similar phraseology in the form of an advisory resolution regarding wheat as well.

Chairman.—Will you kindly listen to this as a possible formula to serve as a basis of discussion ? " That the present world conditions in the matter of wheat production and that the Wheat Import Duty Act is an annual measure (not permanent) are two facts which should be borne in mind by Provincial Governments which contemplate schemes involving expansion of the wheat area " that is, not schemes which are intended to increase it but which involve the expansion of wheat. As a matter of fact these are the only two factors which compel us to give this advice, first the world condition, and the second that the Central Government has to keep this Import Duty Act going, which I think justify our more or less prominently bringing to the notice of Provincial Governments this advice. Do you think any Provincial Government could reasonably object to it ?

The Hon'ble Sir Miles Irving.—I think no Government can object to being given advice.

Rao Bahadur Narasimha Raju.—And increased production of wheat as well.

Chairman.—That would not be fair. That would prevent the activities of the Agricultural Department.

Sir T. Vijayaraghavacharya.—That would be against scientific advance.

Chairman.—I take it that the Conference would prefer to substitute this for what we were discussing under this head. The Conference agreed.

To this Resolution the statement of prices which has been given by our expert had better be appended ; and I trust he will be able to give us Argentine prices too.

We are at page 10 of this Note. The next point is external markets and the Note says that there is no immediate prospect of capturing them. That I think is an accurate description of the situation. As to internal markets the matter has to be left as in the case of rice to the Marketing Board. As regards railway freights, the same observations as in the case of rice. Paragraph 4 of Part II of the Note. The Sub-Committee unanimously recommend the creation of a Standing Committee on wheat of the Advisory Board of the Imperial Council of Agricultural Research on the same terms as those suggested for the Committee on rice. Any observations on this, gentlemen ?

Mr. W. J. Jenkins.—I should just like to ask if it could be recorded that in view of the importance of wheat trade to Karachi a commercial representative from Karachi should be included on this committee.

Sir T. Vijayaraghavacharya.—It is a matter for the Advisory Board to consider.

Chairman.—I take it that the Conference endorses paragraph 4 of Part II at page 10 of the Note. This concludes the Note on wheat. But before we go on to the next item, I shall be glad if any member has to offer any observations on wheat in general. (No member had any observations to make.)

Then we proceed to cotton, Part III of the Note. The Note says that the questions to be considered are two, namely, increase in the total area and the selection of varieties, and we are told that a Sub-Committee of the Indian Central Cotton Committee is engaged in pursuing these two matters. So far as discussion on cotton at this stage is concerned, perhaps the Conference will be satisfied with this remark ; but I believe the Conference expects our expert in agriculture to tell us later on when the question of substitution comes what is the extent of area that he considers can be suitably brought under cotton during the next few years without impairing the prospects of a good price for cotton or at all events of the price that has been prevailing during the last two or three years. That is so far as the area is concerned. No doubt the cotton committee is pursuing the question of selection of varieties, but perhaps Mr. Burt will tell us what stage these enquiries have reached.

Mr. B. C. Burt.—Well, Sir, the Central Cotton Committee set up a Sub-Committee to discuss this question in consequence of the temporary boycott of Indian cotton by Japan and decided that it must go on and see whether it is possible to make India less dependent on one single large buyer. The Committee has met and has made two specific recommendations so far—both of very considerable importance. One is that every effort should be made to extend the medium staple type of cotton known as Verum in the Central Provinces. That is a cotton produced as a result of one of the Central Cotton Committee's own research schemes. It has

already proved successful both to the cultivator and to the Indian mills, and what is required is a greater effort to extend this cotton in all suitable areas in that province. That is a recommendation with which the Central Provinces Agricultural Department are in complete agreement and everything possible is being done.

The second important recommendation which the Sub-Committee made was in regard to Sind. It was to the effect that a special long staple cotton area should be developed in Sind. Sind has always been spoken of as a potential long staple cotton area and the Indian mills very badly need a greater supply of staple cotton which Sind could profitably provide. The Committee recommended that some such area as would produce about 3,00,000 acres annually of cotton (which would produce under Sind conditions about 1,50,000 bales) should be reserved for long staple cotton growing. I think I am correct in saying that the total area to be brought under cotton on the Barrage is about 7,50,000—not quite so much as that. That recommendation is at present under the consideration of the Sind Agricultural Department and Mr. Jenkins can tell us that there has been a very considerable progress already in that direction. Those are the two recommendations which the Committee has made up to the present and they are further considering the matter. (*Honourable Sir Frank Noyce* : Who will buy the cotton ? The Indian mills mostly !) The cotton will be suitable both for the Indian mills and for export to the United Kingdom.

Mr. W. J. Jenkins.—Before we leave this question, I should like to know whether it will be competent to suggest to this Conference a recommendation to the Government of India that an amendment of the Cotton Ginning and Pressing Factories Act should be made which will enable the licensing of ginning and pressing factories to be introduced in such provinces as consider that desirable in the interest of the extension and marketing of better cotton. We in Sind are making a big effort to grow cotton which is at present being imported into India from abroad and we feel—and I think every province which has the matter at heart will feel—that such a measure will go a long way to help us. When the Cotton Ginning and Pressing Factories Act was passed this enabling clause was omitted. I think conditions have changed since then and the opposition which was evident at that time would not be so strong now. There are a large number of ginning factories in Sind and still more are being put up. (*Chairman* : Are they of more than 2 years' standing ?) About three-fourths of them are old factories. The position is changed in Sind. The Sind Cotton Committee is to meet on the 14th of this month to decide whether the time has not arrived to stop the construction of new ginning factories on the Barrage areas.

The Hon'ble Sir Frank Noyce.—Your view would be that the licensing of ginning presses is an essential factor in improving the marketing of cotton.

Mr. W. J. Jenkins.—Yes.

Sir T. Vijayaraghavacharya.—The Central Cotton Committee has already made that recommendation. The recommendation is now under examination in the Commerce Department, the Department of Education, Health and Lands and the Imperial Council of Agricultural Research.

Chairman.—That is satisfactory. In my province there are ginning factories like Rest Houses at a distance of every 10 miles but many of them are not working !

Chairman.—Next we come to Jute. Part IV of the Note. Do you like to say anything, Mr. McLean ?

Mr. K. McLean.—I have nothing to say. The Report is under consideration of the Bengal Government.

Chairman.—The other provinces are not interested in it. We might leave it at that. Next we come to oil seeds. Part V of the Note. These have been dealt with under four heads,—A. groundnut and castor ; B. linseed ; C. rape, mustard sesamum and cotton seed, and then again D. linseed, castor, groundnut rapeseed and sesamum oils. As regards A. groundnut the recommendation (*a*) at page 11 says " That this Sub-Committee recommends that the Government of the United Kingdom be approached with a proposal to impose an import duty on all foreign fats, oils and oilseeds which compete with oilseeds produced in the Empire ". Does not anybody propose to make any observations on that ? ' No need for placing any restriction on its cultivation, but that there might be room for cautious expansion '. May I ask what is the quantity of groundnut exported ? In what quantity do our experts think groundnut can be further exported without reducing the price of the groundnut already exported ?

Mr. M. Vaidyanathan.—The actual quantities of exports of groundnuts from India were—

	Tons.	
1929-30	714,000	
1930-31	601,000	
1931-32	672,000	
1932-33	433,000	
1933-34	546,000	There is increase this year over last year's.

Chairman.—What have we been doing with the balance ? Have we been producing enormously ?

Mr. M. Vaidyanathan.—The estimated yield in tons in groundnut has increased from 2.7 million tons in 1929-30 to 3.2 million tons during the current year.

Chairman.—The Committee reports that there is no need for restriction, but there is room for cautious expansion. Will Mr. Burt kindly explain ?

Mr. B. C. Burt.—The internal market for groundnuts in India is extremely important. The internal market for the oil is expanding, and groundnut oil is the one oil which is being used by all the new hydrogenation plants which are producing Vanaspathi Ghee to replace imports of fats and other kinds of vegetable ghee. After going into the trend of exports and the increasing demand for internal consumption we came to the conclusion that there was room for cautious expansion, especially in those provinces where the groundnut area is not very large, and where it is very desirable as a rotation crop.

Chairman.—What would you place the increase in output at ?

Mr. B. C. Burt.—I don't think we can commit ourselves to figures yet.

Chairman.—If you are going to give advice to provinces to go ahead and increase the area under groundnut, you cannot say that you are not prepared to commit yourself to figures. How do you expect the provinces to commit themselves in giving advice to the cultivators ?

Mr. B. C. Burt.—The position is this. The two provinces which are really dependent on the export market are Madras and Bombay. The Central Provinces, for example, the third greatest groundnut growing province, consumes the whole of its groundnuts within its own borders for crushing oil, and it finds no difficulty in marketing its oil. Incidentally I might mention that there is an expanding export of groundnut oil.

Chairman.—I do want the conclusions of the conference to be definite enough to enable the provinces to act on them.

Dr. W. Burns.—I may state, Sir, that to give advice in such detail it would require a very much longer period of consideration than we have been able to give to this question, and also a great deal more consultation between the provinces themselves. I agree that it is highly desirable at the present moment that we should merely indicate the general directions in which the expansion could take place. The expansion actually in the two provinces mainly concerned, namely Madras and Bombay has been encouraging. In Bombay in the year 1900 there were only 50,000 acres, whereas now there is about a million and two hundred thousand acres under cultivation. That figure has remained fairly steady since about 1929. When groundnut does not pay, cotton tends to take its place, and when cotton does not pay, groundnut tends to take its place. But undoubtedly there are in many places lands which can be put under groundnut cultivation if the prices remained steady. The price has gone down, but it has not gone down to such an extent as to discourage people altogether from going in for groundnut cultivation. I understood from the papers that this year there had been a reduction in the area in Madras. That apparently is a mistake, because the figures have shown to us that there was no such reduction. The press in fact went the length of saying that there had been 50 per cent. reduction in some areas, but as far as I could see, speculation in this groundnut business affects the markets very greatly, because I have before me a letter from a banker which says that he is having a lot of worry just now owing to violent fluctuations in the price of groundnut. Therefore, if we have the prices jumping about so violently, growers of groundnut can't say where they are. This is a factor which we have to take into consideration. Apparently there is no falling off in Madras supply. There is very little falling off if any in the Bombay supply, but we are not in a position to recommend restrictions, nor are we in a position to recommend exactly how the expansion should proceed.

The Hon'ble Sir Frank Noyce.—Could we not ask the Agricultural Research Department to work out something more definite in consultation with the provinces ?

Sir T. Vijayaraghavacharya.—As a matter of fact, all these subjects are taken up.

The Hon'ble Sir James Grigg.—I was very struck by a remark which fell from one of the speakers who said that the ryot is quite prepared to

grow cotton when groundnut does not pay, and to grow groundnut when cotton does not pay. That seems to indicate that the ryot knows his business quite well ; if only he can get the information quickly enough, he will be able to take the necessary action in time. The key to the situation is to give information to the ryot quickly enough.

Sir T. Vijayaraghavacharya.—We are setting up a Bureau of Information.

Chairman.—That is why I am afraid of a recommendation like this going out saying that there is room for cautious expansion. The person who is to derive the benefit may say—' Well, I am only adding a hundred acres,—that is quite cautious ' ; but if many hundred people do that, then the word ' cautious ' loses all its value.

Mr. H. M. Hood.—With regard to groundnut in Madras, I think I am right in saying that there has been no material reduction in the area under cultivation. We have been told several times that the quality of groundnuts in Madras is inferior, when I inquired of the merchants, they said that they did not think that the quality had deteriorated, but still something might be done to improve the quality of the groundnut. The decortication of groundnut leaves something, to be desired, and something might be done to see that there is no falling off in the quality of the decorticated seed.

Sir T. Vijayaraghavacharya.—We are setting up an Oil Seeds Committee which will deal with all these subjects, and we intend consulting the Madras Government about the constitution of this Committee.

Mr. H. M. Hood.—But the important question to be remembered is the question of depression in prices. I do not know whether anything can be done with regard to European markets, whether any action by the Government of India is likely to have any effect in regard to the restriction that has been placed on the import of groundnuts into, I think, France and Germany.

Chairman.—What is the percentage of produce that is actually exported to France and Germany ?

Mr. M. Vaidyanathan.—Out of a total export of 433,000 tons in 1932-33 roughly 50 per cent. to France and 11 to Germany.

Chairman.—I was asking what is the percentage of produce that is actually exported, and I find about 20 per cent. of the total yield is exported. About 80 per cent. is consumed in the country.

Mr. A. M. Livingstone.—There is an excellent Report on the groundnut position published by the Imperial Economic Committee in London. That shows that the consumption of groundnuts has decreased very largely in recent years largely owing to the utilisation of other substitutes for vegetable products, and particularly the use of whale oil, which is very largely used for making margarine. It has the power of absorbing and retaining a fairly large percentage of water, and so margarine manufacturers have been using whale oil instead of vegetable oil. The decrease in consumption of groundnuts, according to the Report, apparently came to an end in 1932, and actually the consumption of groundnuts in Europe in 1933 showed some increase. The Imperial Economic Committee come to the conclusion that there are other favourable factors apart from this

increase in consumption in 1933. They point out that the policy of several European countries is intended to raise the prices of their animal fats, such as butter and so on, and that if the price of butter is in any way put up they anticipate that the price of margarine will rise at the same time, which should assist in increasing the consumption of groundnuts and probably improving the price. They draw attention also to the possibility of groundnuts being used in some other ways. But they are very cautious in their conclusions, and therefore the Sub-Committee thought that they should be equally cautious when making any recommendation to the provinces. Apart from this world position the provinces should have regard to what they think is going to be the consumption within their own borders in the way perhaps of having more mills and increasing the output of the mills. They should take these factors together when deciding how far expansion of the groundnut area should go.

Chairman.—What was the total area under groundnut last year ?

Mr. M. Vaidyanathan.—8.1 million acres as compared to about 6 million acres before the depression.

Chairman.—On the facts within your knowledge, if you were owner of 8 million acres and another 2 millions were available how much of those two millions would you bring under groundnuts ?

Mr. A. M. Livingstone.—I would wait and see if prices will rise.

Mr. B. C. Burt.—May I refer to one remark which Mr. Hood made ? When we were discussing the question in Sub-Committee the original proposal was that except in Madras and Bombay there was room for cautious expansion and on further consideration Madras and Bombay representatives considered that they should not stand aside because in Madras it was considered that the area would automatically react to the price and a similar effect would be likely in Bombay whereas there was legitimate room for expansion in other provinces. That is why the recommendation is in its present form. I would like to support the suggestion as to the need for more time before we can make any further recommendation.

Chairman.—For the present we cannot really advise people to bring more area under groundnut ?

Mr. B. C. Burt.—We cannot place a figure on it. We might put it in a negative way that in the Central Provinces which has been specially mentioned, where they are already increasing their groundnut area there is no reason for them to hold their hand.

Mr. J. H. Ritchie.—Our policy in Berar is to recommend groundnut as one of the rotation crops for cotton. As a result of the Botanical scheme financed by the Indian Central Cotton Committee we have found that cotton with groundnut and jowar in rotation gives an yield of nearly double the quantity of cotton. We have therefore been advocating this rotation to the cultivators and the area has gone up during the last ten years from 10,000 acres to 185,000 acres. I should like to see the groundnut crop reaching an acreage of 2 millions in Berar. I asked the Sub-Committee what effect this would have on the general situation, and we came to the conclusion that for the sake of cotton it is best that we should go ahead. But the area under groundnut will fluctuate very considerably with the price not only of cotton but of groundnut itself. This

year I think the groundnut cultivators made more out of groundnut than out of cotton with the result that there is likely to be a very big expansion. So far we have been in the position of being able to absorb and consume all the groundnut we produce. More groundnut comes into the province than goes out. I should like to have the approval of this Conference to the policy of extending groundnut in Berar.

Chairman.—We proceed to castor seed. The Sub-Committee considered that the position was satisfactory and that there was room for its development rather than for its restriction. Here again is it possible for us to say what is the extent of expansion that we visualise, or is it that we do not visualise the extent of expansion ?

Mr. B. C. Burt.—Castor seed is a crop which is bound to proceed slowly. It is only in a comparatively small part of India that it is grown as a main crop. The critical factor in expansion is the demand for high grade lubricants and what the Sub-Committee had in mind was that the position in regard to the demand for castor oil for high grade lubricants should be very carefully watched. This is almost an Indian monopoly. But there is keen competition of course from petroleum lubricants and it was considered important that the supply should be maintained and that development should be very carefully watched.

Chairman.—We are not in a position to tell the authorities that they can add so much.

Mr. B. C. Burt.—No, Sir. The Committee required more time to come to a conclusion.

Sir T. Vijayaraghavacharya.—There is the Oil Committee.

Rao Bahadur Narasimha Raju.—I wish to know how the prices of castor seeds have fluctuated during the last five years.

Mr. M. Vaidyanathan.—Before the depression it was Rs. 6, and now it is Rs. 4-1-0.

Dr. W. Burns.—I trust that the Oilseeds Committee which is to go into this question will seriously consider the future of castor oil as lubricant. We were told the other day in the Sub-Committee by Mr. Tait that it has the great advantage of not mixing with petrol and that this was the only oil for certain aero engines of the rotary type. If it is linked up with aviation there ought to be a big future for it, and that particular point should be looked into by the Oilseeds Committee.

Chairman.—We pass on to (*b*) of Part VA. It was pointed out that there had been great increase in the export of groundnut oil, especially to the United Kingdom after the grant of Ottawa preferences and that the question of stimulating the industry might be left to the Indian Oil Crushing Industry Committee. That does not give us any lead for the present.

Mr. B. C. Burt.—In a further part of this report we deal specifically with the subject and there are some recommendations as to the means by which increased export should be possible. Here we are only dealing with it as part of the groundnut problem.

Sir T. Vijayaraghavacharya.—It comes under General.

Chairman.—Therefore under the head A of Part V, *Groundnut and Castor,* the definite and affirmative conclusion is that the Central Provinces is proceeding with a certain expansion of groundnut and that it may do so. That is all.

Mr. B. C. Burt.—There are other provinces which grow groundnut on a small scale.

Chairman.—I did not say that they did not. I said that the affirmative conclusion is only this—in the matter of expansion.

Mr. B. C. Burt.—To the extent that we are not yet ready to put forward figures.

Chairman.—Part V. B. *Linseed.* The large increases in the exports of Linseed to the United Kingdom since the grant of Ottawa preferences were pointed out and the Sub-Committee emphasised the need for extending the cultivation of linseed in India, especially of the improved varieties. It was also agreed that the favourable position in regard to linseed should be made widely known amongst cultivators and merchants. May we have some facts about linseed ? What is the area under cultivation and what is the output ?

Mr. B. C. Burt.—I have here the area for the production of linseed for a series of years. In 1933-34 the area was 3¼ million acres and the estimated yield was 377,000 tons. In the previous year the area was practically the same with a production of 406,000 tons. The export in 1933-34 was 379,000 tons, and in the previous year it was 72,000 tons.

Chairman.—How much room, in your judgment, there is for more exports ?

Mr. B. C. Burt.—There is a regular market for export for 400,000 tons and there is internal consumption of 200,000 tons in round figures. So that we can do with 600,000 tons of linseed which on past records would mean an addition to the area of about 2,000,000 acres.

Chairman.—Is that the conclusion with which the Sub-Committee have agreed ?

Mr. B. C. Burt.—Yes.

Chairman.—Which are the provinces in their order of importance that actually produced linseed last year ?

Mr. B. C. Burt.—The Central Provinces is the most important province. Other provinces are the United Provinces, Bihar and Orissa and Bengal. Hyderabad State is also important.

Chairman.—Then it really comes to this that the Central Provinces, United Provinces, Bihar and Orissa and Bengal can go ahead in adding to their areas by about 50 per cent., leaving a little bit for other provinces. I think that is a fair statement to make.

Dr. D. B. Meek.—In this connection I would like to mention one point. I do not wish to discourage the view that there is a possibility of good trade in linseed, but it must be remembered that the only competing country is Argentine and for the last two years they have been having very poor crops. Therefore, this large expansion in our export might

have been influenced to a considerable degree by the poor crop in Argentine. That factor should be borne in mind while giving advice for the expansion of linseed.

Mr. B. C. Burt.—Perhaps we ought to give the basis on which we arrived at 400,000 tons export. The United Kingdom for many years past has averaged an import of over 300,000 tons of linseed. Last year it was shown that our preference was sufficient to enable us to practically exclude other linseed from the United Kingdom market. We have a 10 per cent. preference. There is also a fairly steady market on the continent and in America for Indian linseed for pale linseed oils. Then there is the internal consumption of at least 200,000 tons.

Chairman.—Now, we come to Part V (C) *Rape and mustard, sesamum and cotton seed.* On page 11 the Sub-Committee says : " So far as foreign exports were concerned the resolution referred to under A (*a*)—*Groundnut*—would cover the case of these oil seeds. The question of developing internal markets should be left to the Indian Oil Crushing Industry Committee of the Council." So, there is nothing definite at present about it and we had better leave them alone.

Part V (D) *Linseed, castor groundnut, rapeseed and sesamum oils.*—The Sub-Committee says : " Complaints had been made by merchants in Bombay that facilities for tank wagons on railways and tank accommodation on steamers and facilities for storage of these oils at the Indian seaport were lacking."

Mr. Tait.—When this question was brought up before the Sub-Committee, I said that it would be gone into. So far as the complaints regarding the tank wagons are concerned, I brought this matter to the notice of the Railway Board and it is now under their investigation. At the same time, it would be of assistance if Mr. Burt could let us have some indication as to what the extra amount of these oils would be for which tank wagons are required. If he could do so, it would help the matter materially.

Mr. B. C. Burt.—I can give those data later on and also the figures supplied by two merchants as to what they expect to do if these facilities are provided. The point which the Sub-Committee had in mind was that we should take advantage of the Ottawa Preference and export more groundnut oil to various Empire countries and the two merchants in Bombay have given us their observations as to what they expect to be able to do if they get these facilities. I will send them to Mr. Tait later.

Rao Bahadur C. Tadulinga Mudaliar.—May I know why the Safflower oil which is very largely edible in the Tinnevelly and the Deccan districts is not included in the list.

Sir T. Vijayaraghavacharya.—From an All-India point of view, it is a very small crop.

Chairman.—We now come to Part VI. *Sugarcane.* Is any member of the Conference who was not a member of the Sub-Committee desirous of obtaining any information under this head ?

Mr. P. B. Richards.—The danger of over-production of sugarcane was discussed in the Sub-Committee, and from the point of view of the largest producing Province, one is naturally interested that there should not be

such an expansion of the sugarcane area in Provinces which previously have not been sugar producers, as to endanger the market. Judging from the white sugar imports, it would appear that saturation point is rapidly being reached. The difficulty which was instanced in the Sub-Committee about making any specific recommendation was that we had no measure of the amount of gur which could be consumed at economic prices. That must be admitted. It is, however, to be hoped that the Sugar Committee will give their very careful consideration to the matter and endeavour to estimate as closely as possible the economic off-take both in gur and in sugar, and, as a result of that, possibly at some later date will be able to make recommendations to Provinces that they should be extremely cautious in stimulating the production of sugarcane lest the quantity produced should be more than India can consume.

Chairman.—We are producing only the quantity which we will ourselves be able to consume.

Mr. P. B. Richards.—That is the case at present, but I understand that the quantity of white sugar imported into India.....

Chairman.—They may not make any more sugar than they required.

Mr. P. B. Richards.—But if cane is grown in excess of the requirements, then the bottom must drop out of the general cane or gur market.

Chairman.—If the unit be a province and if a province does not produce more sugar than it requires, then will you say that it should not produce even that much ?

Mr. P. B. Richards.—The sugar-producing provinces of India are and apparently always have been the United Provinces and Bihar and Orissa. We depend largely on our sugarcane. It is but natural that we should view the problem first from the point of view of our own cultivators, and be perturbed when other Provinces express their intention of becoming self-sufficing. Should there be over-production, it will equally hit the new producing provinces and reduce the value of the sugarcane crop everywhere.

Chairman.—That is perfectly true. But the position you take up brings us very acutely to view the great principle underlying it, namely, that each province should be ear-marked as especially fit for production of certain crops which it should grow and develop and that other provinces as far as possible should not trespass upon it if it can be helped.

Mr. P. B. Richards.—The policy of self-sufficiency seems to me to run counter to the fundamental idea for which this Conference was called which was for crop planning on an All-India basis, and personally I greatly deplore the attitude that has been taken up. I do not press for any restrictions. I would only request that the position should be carefully watched in view of the future information as it becomes available.

Chairman.—I quite agree with you that these two principles are more or less incompatible.

Rai Bahadur B. B. Mukharji.—So far as Mr. Richards' observations go, I feel that we cannot really accept the statement that one province and one province alone should grow a particular crop. You are aware that in Bengal we have been rather hard hit by the absence of a money crop and,

jute having gone down, we are experimenting very seriously as to what its substitute should be. So far our experiments of sugarcane have been found to be satisfactory. Secondly, you are aware that the main crop of Bengal is *aman* paddy. It has been calculated that it does not take more than 92 days for a paddy cultivator to grow this crop and therefore the problem with which we are faced now is to find work for our widely extended cultivators who are not getting sufficient employment for the rest of the year and the sugarcane industry is a thing which we are aiming at. As regards the point that we have met here only for All-India planning, I am afraid I must protest with great respect against merely considering that. Provincial autonomy does not mean that we should be left to be guided in all our internal matters, even in the matter of the consumption of our foodstuffs and the growing of foodstuffs in the interests of somebody else. If I am quite fit to grow a crop at least to the extent of my home consumption, I must be permitted to grow that crop. I am perfectly prepared to go with my friend in all his helio-centric activities but I am afraid if I am rigidly restrained in details the fundamental basis on which the federation of autonomous provinces can develop will go.

Dr. W. Burns.—The position of Bombay with regard to the extension of the sugarcane is that up till the imposition of the import duty on sugar which has stimulated the production of sugar in India, the Deccan canals were largely dependent on sugarcane being produced and that question has been before the Bombay Government and has also been the subject of consideration by other bodies for a long time. Mr. Kamat here was on a committee which specially considered the position of the Deccan canals. Since the imposition of a tariff which has made it possible to develop sugar production in India, five more factories have sprung up in that area and there are now six where there was only one before and it is vital that there should be no restriction in the development of areas where factories may be set up. The supply of sugarcane to these factories is likely to increase. The increase, however, is not such as is likely to affect the general position because our area as compared with that of the United Provinces and Bihar and Orissa is comparatively small. At the moment the area under sugarcane is 67,000 acres, so that even if that were very largely increased, I do not think it would affect the general position in India. I merely wish to emphasize the position of Bombay with reference to its own sugar mills and the necessity of not restricting the supply of sugarcane.

Mr. D. R. Sethi.—I should like to state the position of Bihar. I endorse the remarks of Mr. Richards and I should only like to sound a note of warning to neighbouring provinces which are wanting to go ahead with sugarcane cultivation. It is for them to consider whether they can produce sugarcane as cheaply after the period of protection as we in Bihar and the United Provinces can do.

Rai Bahadur B. B. Mukharji.—You are aware, Sir, our country was formerly known as "Gour" because Bengal was the supplier of large quantities of gur to the rest of India, and there is obviously no reason why we should not go back to our "gur" status.

Mr. C. R. Pawsey.—As far as Assam is concerned, we have very large areas fit for sugarcane and applications for large areas for such

purposes are I believe going to be made and we should not like to be restrained.

Chairman.—There is no attempt under these few inoffensive lines to restrain anybody. We shall pass on to Part VII—*Tobacco.*

The Hon'ble Sir Frank Noyce.—I wonder why the tobacco area is not responding more largely to prices. Tobacco is the one crop the price of which has fallen less than in the case of any other crop. One would have thought that in those circumstances it would have been substituted for other crops to a much larger extent than it has been.

Mr. B. C. Burt.—Largely, I think, because of the amount of capital involved in tobacco cultivation, compared with other crops and to lack of incentive to a larger turn-over. It is rather a specialised form of cultivation and without much propaganda by the Agricultural Department I do not think there would be any great incentive to increase. Such a large proportion of our present production of tobacco is consumed mainly in the country that the future lies mainly with the home market. This is a matter which the Sub-Committee is going to consider.

Chairman.—The Sub-Committee considered there was ample scope for expansion of the area under tobacco of the light type. The bulk of the tobacco produced in India is consumed in India itself and it is heavy. What India requires, it is said, is to develop the light type of tobacco which is suitable for cigarettes. Does that imply that the Committee would like India to consume cigarettes instead of the old conservative hookah ?

Mr. B. C. Burt.—What the Committee had in mind was that there were large imports of cigarettes and also large amounts of foreign tobacco for manufacturing into cigarettes. We can profitably grow that for ourselves and we can also profitably export cigarette tobacco.

Chairman.—This is what I want figures of : What is the quantity that you want to displace—and I presume that that is the quantity which is here described as affording ample scope ?

Mr. B. C. Burt.—I think the import of tobacco of the cigarette type comes to six million pounds per annum.

The Hon'ble Sir Frank Noyce.—How many acres would be required to grow that in India ? Can you give the average ?

Mr. B. C. Burt.—I do not think we can give that safely as the present averages relate to heavy tobacco. The Committee will investigate it.

Chairman.—There is some light type produced ?

Mr. B. C. Burt.—Yes, that is mentioned in the printed note on tobacco. There has been a very marked increase in flue-curing barns which are essential to the light type. In the Guntur district in Madras it was eight hundred, all during the last few years, in the Saharanpur district of the United Provinces it was sixty, and something like fifteen in North Bihar.

Chairman.—One would like to have some information, however general it may be.

Mr. B. C. Burt.—The immediate scope is the replacement of six million pounds of imported leaf and each province can calculate from its own yield

of the area. It would not be safe to give any figures at this stage because all these returns are on a quite different basis, of the leaf imported.

Rao Bahadur Narasimha Raju.—I calculate for the heavy type of tobacco about a thousand pounds per acre—from the experience of ryots in the Guntur district, and, if six million pounds were imported, I would say "a lakh of acres".

Chairman.—Which are the light type tobacco-producing provinces ?

Rao Bahadur Narasimhā Raju.—The Guntur district, for instance.

Dr. W. Burns.—Bombay has possibilities of becoming such.

Mr. K. McLean.—We are just starting light tobacco—most of the type now grown is heavy.

Mr. B. C. Burt.—There is also an important opening for exports. The United Kingdom imports about three hundred million pounds of the cigarette type from foreign sources of which we might easily get a reasonable share.

The Hon'ble Sir Frank Noyce.—The consumption of tobacco in India is also increasing—and of cigarettes ?

Mr. B. C. Burt.—Yes.

Chairman.—It can only be at the expense of the heavy type, because we all hope that the habit in India as a whole will not continue.

Dewan Bahadur T. Raghaviah.—There is scope for expansion of the tobacco cultivation ; so the new type of cultivation need not replace the existing heavy tobacco.

Chairman.—After all, it appears that so far as crop-planning is concerned, ten thousand acres or fifty thousand acres one way or the other are important but they won't make any very large difference. It is a very small crop.

Part VIII—*Fodder Crops. Dairy products.* What are they ?

Col. A. Olver.—All kinds of dairy products. Mainly liquid milk, butter and ghee, condensed milk, and infant foods of which large quantities are imported, but also condensed milk is sold to a considerable extent in canteens : not only is it used in the army but also by the civilian population. Villagers in Madras use considerable quantities.

Mr. A. McKerral.—Condensed milk is also very popular in Burma, which consumes very large quantities—about thirty lakhs.

Mr. H. M. Hood.—It would hardly do to put an import duty on the large quantities of milk and milk products that are being introduced into this country until the milk supply in the country is very much increased and improved. There is nothing to take its place in South India and it will take many years before the milk supply increases.

A member.—There is already a duty of 30 per cent. *ad valorem* ?

A member.—That is a duty for revenue purposes, not a protective duty.

The Hon'ble Sir Frank Noyce.—Surely it has a protective effect also ?

Col. A. Olver.—The duty at present is 25 per cent. of the tariff value, *viz.*, annas fourteen a pound of butter. This duty is, however, roughly

counterbalanced by the exchange position in New Zealand and Australia *vis-a-vis* this country. Moreover butter imported from Australia has an additional advantage in that a very substantial bonus, averaging 3.3*d.* per lb. during 1926—1933, is paid on every lb. of butter exported.

The Hon'ble Sir Frank Noyce.—That cannot last.

Col. A. Olver.—That is the position at the moment. We do not require a heavy duty at all. This country can produce butter fat to compete in the world market given proper organisation of the dairy industry. At the moment the market in the big coastal cities like Calcutta, Madras and Bombay is seriously affected by the exchange position, but the total value of the milk and dairy produce that comes into this country is less than a crore of rupees. The total value of the dairy produce consumed in the country, however amounts to 5 to 6 crores, so that the effect on the feeding of the people of a protective duty would be nil. On the other hand there is unlimited milk all over the country which could be marketed if the industry were properly organised. It is very largely a question of transportation to the markets through collecting centres and a proper marketing organization. There are a few instances of dairying organisations carrying on a profitable business within a certain limited area in the vicinity of mofussil towns, but the trouble is that the whole of this milk has to be produced within 10 or 15 miles radius. In a modern factory at Anand a private company is now producing large quantities of dairy produce on the latest principles and is able to sell tinned butter all over the country at 12 annas a pound.

The Hon'ble Sir Frank Noyce.—As against a price of 14 annas imported ?

Col. A. Olver.—Australian and New Zealand butter is now imported into Bombay at 10 annas a pound, c. i. f. not including duty.

Dr. D. B. Meek.—The average wholesale price last year was 14 annas a pound exclusive of duties, that is the tariff valuation.

Col. A. Olver.—There is also German butter coming in, but it is adulterated. This butter is being sold in Bombay to-day at 9 annas a pound but it is an adulterated product and the effect of that on the feeding of the people must be bad. There is one point I should like to mention here. We have definite evidence that if indigenous Indian cows are well fed and managed, it is not difficult to increase their milk production by 64 per cent. and that the cost per pound will fall steadily with the increase in yield. I will give one concrete example and that is the dairy at Muktesar. There, in a little over a year, the average milk yield has been raised from 8.7 to 14.6 lbs. per diem and the cost of production has fallen by 40 per cent. That is the kind of thing that can be done in this country with proper organisation. My view is that dairying should be developed in India not by trying to start big dairies entirely as a separate industry but by developing dairying in villages as a by-industry in conjunction with agriculture. We were given a good example of what could be done yesterday when we were told that the yield of cotton could be doubled by growing alternate crops of ground nut and I do not see why this could not be done in the case of dairy produce if fodder crops, particularly leguminous fodder crops were grown in conjunction with such crops as cotton and ground-nut, the cotton-seed and ground-

nut cake being fed to dairy cattle as concentrates. It then becomes a matter of organisation of collecting centres in order to bring the milk to the satisfactory markets.

Mr. H. M. Hood.—The whole of your argument is that a duty is unnecessary. May I ask whether that is actually your contention ?

Col. A. Olver.—No. My argument is this, that an import duty would mainly affect the big coastal cities such as Calcutta, Bombay and Madras which are the cream of the market. Elsewhere the industry could hold its own. What is required there is to reduce the heavy transportation charges to the cities and to prevent adulteration. If you want people to put money into dairying enterprise, they require security. They require security that the industry will be protected from what now amounts to dumping and from adulterated products. I have information that the present price of butter fat in New Zealand is not an economic price. Col. Matson who has made a special study of this subject for many years and who is now engaged in commercial dairying in New Zealand is my authority. The fact is that at present no one will be anxious to put money into up-to-date dairying unless there is some assurance of stability.

Chairman.—It is perfectly true, but at the same time it appears that the resolution as framed is not agreed to by all the members.

Some members : No.

Mr. A. McKerral.—The total All-India import of milk and milk products is of the value of 1.17 crores and of this Burma takes .47 crores or very nearly half. The Burmese people being Buddhists by religion do not, generally speaking, drink cow's milk nor consume the products of milk, but strange to say they have no objection to certain milk products and consume large quantities of imported condensed milk and milk products like Glaxo. The duty, if imposed, would, therefore be sure to meet with considerable opposition in Burma.

Chairman.—Does it matter to them where the condensed milk comes from. Would they refuse to take it if it did not come from Canada ? That will only mean that the Burmese on account of religious sentiment will not be able to benefit from this change.

Mr. A. McKerral.—That is so.

Dr. W. Burns.—Would Col. Olver tell us whether it would help the Indian produce if duties were imposed in advance of legislation to safeguard quality ?

Chairman.—That is exactly what I was going to say. The Resolution as passed if read a little carefully appears to be open to some criticism, while a great deal can be said for it. It says that this sub-committee recommends that a protective duty be levied upon all imports of dairy products which are or can be produced in this country. It does not say what the extent of that duty is. Government cannot possibly take action on this unless there was a regular impartial inquiry into the matter. At present Col. Olver has certain information which has no doubt been derived from a certain set of people. Other people may have information from the other side. What the Conference can reasonably expect Government to do is to make an inquiry into the matter through the usual agency of the Tariff Board. First we will have to see whether there is a case for

protection or not. Is it worth while doing, and if so what does it actually mean ? Does it mean a light duty or a heavy duty, and if so, for how long? Therefore if you simply ask us to impose a protective duty, it will not be really business like. What it really amounts to is that it is a case for examination and no more. If the Government gets the results of an impartial inquiry by the Tariff Board, then they will be in a position to arrive at a decision. If this view meets with the approval of the Conference, then the recommendation can be modified easily to accord with that view. What does Madras think ?

Mr. H. M. Hood.—I entirely agree with you.

Rai Bahadur B. B. Mukherji.—Yes.

Chairman.—Then shall we take it that this Resolution is passed ?

Mr. A. D. Gorwala.—Is it not necessary that there should be an infant industry to protect before we adopt such protective measures as are intended in this Resolution ? At present certain articles are not produced and yet the imposition of import duties on them is suggested.

The Hon'ble Sir Frank Noyce.—We propose that an enquiry should be made into the extent to which there is an industry.

Chairman.—Our industries are at present in the shape of butter producing industries. We can modify the Resolution in this way :—

> " This Conference recommends that the question of protective duty on all imports of dairy products be examined by the Tariff Board ".

Part IX.—Fruits and vegetables (including roots).

Chairman.—The sub-committee has recommended :—

> " that at the present moment all the provinces are making special efforts to extend and improve these crops and consider that their efforts should be co-ordinated more than they are now ".

Sir T. Vijayaraghavacharya.—The point is that the Provinces want the Imperial Council of Agricultural Research to exercise a little more control. We are giving grants to provinces for fruit research and they want us to bring all of them into line.

Dr. W. Burns.—In this case, there is no question of over-production. From the statistics it appears that in Bombay only half an ounce of fruit vegetables are consumed per day per man, whereas in New York it is one pound per day. As far as the consumption of fruit and vegetables is concerned, taken all together, there is an enormous market. It is only a quetsion of proper marketing facilities. In the matter of export of fruit overseas all the provinces in India are likely to compete with one another. In that direction we require co-ordination and before any efforts are made to capture external markets, I consider that the whole business should be done through one agency in India, otherwise we shall land ourselves in hopeless muddle.

Rao Bahadur Narasimha Raju.—May I know what is meant by co-ordination in marketing fruits. Bombay and Karachi do stand in an advantageous position being nearer to European ports. But the

eastern parts of India, the Madras coasts, are far away from European ports and on that account, they suffer in comparison with the western parts of India. What do you mean by co-ordination ?

Dr. W. Burns.—I shall explain. There is for example in Liverpool a possible market for bananas. Madras is producing bananas and it is now tempted to send them to northern India. If proper steps could be taken to send those bananas to European markets it will be good. Presumably her own market is over-flooded with bananas. What I suggest is that things like these should be exploited only by one agency acting for the whole of India, working, I presume, through the High Commissioner, rather than that individual provinces should make individual efforts.

Sir T. Vijayaraghavacharya.—The High Commissioner himself has written to me that there is unhealthy competition among Indian dealers as regards mangoes in the European market.

Rao Bahadur Narasimha Raju.—That is principally with regard to Bombay mangoes. I am making my own efforts to find a market for my mangoes. But I find it impossible to send mangoes from Madras. The railway freight is very heavy and there is unhealthy competition from mangoe growers in other parts of India. Even on the west coast, there is competition between Ratnagiri and some other place. If Dr. Burns wants co-ordination, let Bombay province first do some co-ordination within its own province. I believe there is no other province which competes with Bombay in sending mangoes to the Continent.

Dr. W. Burns.—The United Provinces Mango Growers Association is keen on sending mangoes to Europe.

Mr. H. M. Hood.—The question of bananas has been referred to. We grow enormous plantations of bananas in the south of the Madras Presidency, but the difficulty is to find a market for them. One of the chief difficulties is the difficulty of transport, and we have been trying to get concession rates and more suitable rolling stock and so on in carrying these plantains. Of course if we develop our own west coast port, we could put the bananas on board for export much more cheaply.

Chairman.—What is the extent of fruit farming in the different provinces ?

Mr. M. Vaidyanathan.—We have got statistics for fruits and vegetables combined in the Agricultural Statistics. They are 5 million acres during 1932-33 ; Burma comes first with 1.2 million acres, Madras .7, United Provinces .6, Bengal .8, Assam .4, Bombay .3, Punjab .3, Central Provinces .1 and the total is about 5 million acres for the whole of India.

Dewan Bahadur T. Raghaviah.—The idea of the sub-committee in making this recommendation was that there was want of a central organisation in regard to marketing of fruits and vegetables in India and outside and that there should be some agency set up by the Imperial Council of Agricultural Research or by Government which would act as a sort of clearing house and which would eliminate unhealthy competition and bring about co-ordination between the various provinces.

Chairman.—That will properly come under marketing and we will proceed to the next item.

Part X.—*Cereals other than rice and wheat, specially barley, jowar, bajra, maize and gram (including pulses).*

Mr. B. C. Burt.—At present barley, jowar, bajra and gram and a little maize are exported.

Sardar Sampuran Singh.—When I was last in London, I made enquiries as to what other articles of agricultural commodities except wheat and cotton could be conveniently exported to Europe. I took with me samples of the various pulses that are imported into England from Mesopotamia and East Africa and on comparison I find that the qualities of pulses that we produce here are far superior to those imported from Mesopotamia and East Africa. It is all a question of co-ordination of marketing. If proper enquiries are made, we could export a large quantity of these pluses to European market.

Dr. D. B. Meek.—I have no objection to this recommendation of the sub-committee. We will examine it and see what could be done.

The Conference agreed with the recommendation of the sub-committee.

The Conference then went on to page 12 of the Note, " General ".

Chairman.—We have decided what is in existence in the present scheme of crop planning and we have said that it should continue or at all events we have not advised curtailing the cropping as it exists at present. The question now is what are the crops that we feel should be pushed, if any, and to what extent and by whom. The Conference should arrive at definite conclusions on this and the question of alternative crops should be discussed.

Madras.

Rao Bahadur Narasimha Raju.—I understand at present 50,000 tons of white sugar is being imported, and the acreage of 50,000 acres is expected to supply that imported sugar. I do not think the idea is possible.

Rao Bahadur D. Ananda Rao.—The area at present is 1,21,000 acres and I estimate another 50,000 acres will make us self-supporting in regard to sugar as well as gur.

Mr. H. M. Hood.—The Madras Government has considered the recommendation made by this sub-committee but 50,000 acres here and 50,000 acres there is not going to make a big difference in the position of the paddy market when we have about 11½ million acres under paddy.

Chairman.—Every little thing helps the agriculturist.

(No comments on Madras).

Bombay.

Dr. W. Burns.—I should explain that these crops here were suggested in connection with the question of substitution in rice areas.

Mr. A. D. Gorwala.—Sind accepts that position.

Burma.

The Hon'ble Sir Frank Noyce.—Can you grow linseed ?

Mr. A. McKerral.—We tried it before in 1919 but under the existing conditions at that time it was not successful. Conditions may be more favourable now and I mean to try it again next cold weather.

Bihar and Orissa.

Chairman.—In view of the statements of Madras, Bengal, Burma and Assam, do you still intend to increase your sugarcane area ?

Mr. D. R. Sethi.—It is not a question of our intending to increase our sugarcane area. We have 30 factories in our province and the experience in the past year was that there was not enough sugarcane, at least in North Bihar, to feed these factories. Our forecast figures are never really very accurate, and if the factories want sugarcane the cultivators will automatically increase the area.

With your permission I should like to make a few modifications in this paragraph as it reads now. It should read as follows :—

> " Bihar and Orissa was hoping to show a further increase under sugarcane during the next few years. Its autumn rice in unprotected areas in Bihar proper was precarious and it was possible to replace some of this by more remunerative crops. If protection is afforded to the Indian dairy industry, the province had possibilities of growing fodder crops for which there is a great need."

The last two sentences should be combined into one and should read thus :—

> " There was also scope for the expansion of the acreage under linseed with efficient marketing."

I do not think there is any scope for the expansion of gram and other pulses in our province.

Central Provinces.

The Hon'ble Sir Frank Noyce.—What about increasing the acreage under cotton ?

Mr. J. H. Ritchie.—We produce as much cotton as we can and I do not think there is scope for much further expansion. Til (sesamum) seed we are also willing to expand in certain Districts and I am looking into the economics of its production.

Chairman.—The net result is that in cotton the definite recommendation is only for Madras to go on with 50,000 acres of Cambodia and in Sindh we should see their programme of expansion of cotton, rice and wheat. Besides Madras and Sind cotton does not seem to be a favourite. Sugarcane comes in for 300,000 to 400,000 acres in different provinces. Fruit is pursuing a good career of progress but there is no definite recommendation. Barley is to be taken up by the United Provinces and linseed is one definite crop which to the extent of 2 million acres could be pushed.

Mr. P. B. Richards.—The United Provinces also hopes to extend its production of sun-hemp.

Chairman.—Besides this there is an increase in tobacco of 30,000 acres.

There is no recommendation before us about fodder crops, but I am quite prepared to take up any recommendation that is made now.

Col. A. Olver.—I think that not only in connection with the dairy industry but also in connection with the improvement of live stock all round there is a very big scope for fodder crops.

Dr. W. Burns.—This question is not contingent on the development of the milk industry. It seems to me that it is very necessary at the present moment in order to develop the ordinary milk supply, which at the present moment is deficient both in quality and quantity.

Chairman.—What is the definite recommendation ?

Col. A. Olver.—That a considerable increase in the production of fodder crops should be made for the development of the dairy industry and of live stock.

Dr. W. Burns.—There is a definite opportunity in this.

Rai Bahadur B. B. Mukharji.—Would it be impossible for the Central Government or the Agricultural Research Council to supply up-to-date information to the provinces about machinery, methods of canning, and so forth ? People in Bengal are struggling with very limited knowledge and it would be extremely helpful if we could have some sort of propaganda in this matter. I found that in one place in Bengal milk was being sold at 32 seers per rupee, whereas in Calcutta you could not get more than 3 seers per rupee. There is a big difference between the price at the centre and the price outside.

Chairman.—You do not really suggest that at the place where milk was selling at 32 seers per rupee, it was not being used for producing ghee ?

Rai Bahadur B. B. Mukharji.—No, Sir. But there is the difficulty of transport. The Jumna and the Brahmaputra intervene and it is very difficult to get these things transported.

Col. A. Olver.—May I say that it is in that connection that we want a Dairy Institute ? It is largely a question of processing and transport. We do not know at present the best methods of marketing but there is any amount of milk available.

Chairman.—That is not a question which this Conference can help in deciding.

Sir T. Vijayaraghavacharya.—It has been decided already.

Col. A. Olver.—The total area under cultivation of fodder crops at present is 5 per cent. of the total cultivated area. That is an extremely low proportion. In England it is 35 per cent. and there is ample rich grazing in addition. There is great scope for expansion of fodder crops in India.

Chairman.—I should be glad to hear the views of provinces. Are they prepared to treble the area under fodder crops ?

Mr. H. M. Hood.—It is not possible for the Government of Madras to make any such definite undertaking. They have no power to dictate what crops should be grown.

Chairman.—It is a provincial subject.

Mr. H. M. Hood.—Yes. But they have no authority to order that any particular crop should be grown.

Chairman.—If you go to the Legislature and take the power ?

Mr. H. M. Hood.—There is very little prospect of any such legislation being passed. We are taking active steps by giving concessions to develop the area under fodder crops. The Madras Government are definitely attempting to foster the growth of fodder crops.

Rai Bahadur B. B. Mukharji.—It is possible to bring a much larger area under fodder crops cultivation in Bengal as a second crop. Action is being taken in that direction. It is one of the main duties of the Agricultural Department to carry on experiments and propaganda for growing fodder crops.

The Hon'ble Sir Miles Irving.—The Punjab Government would not be prepared to agree to any legislation by which the cultivator would be compelled to grow this crop or any other. I do not think it has been suggested in this Conference. The question of fodder crops involves the other question of superfluous and useless cattle. It may tend to increase the number of cattle which ought not to exist at all, or exist uneconomically.

Col. A. Olver.—In order to provide the number of bullocks which are required to cultivate the land, breeders at present have to produce an unduly large number of cattle. Many of these are inefficient and have no value whatever. If they were better fed, we would get better bullocks and a smaller number could do the work. That is the direction in which breeders will have to progress. It is of no use producing an inefficient animal because it can be cheaply reared if it is unable to do the work required.

The Hon'ble Sir Miles Irving.—I do not think there is any prospect of any increase in the fodder crops in the Punjab. We reduced the water rates some time ago. It had not the least effect on the growth of fodder. We had to increase them recently. We do not expect there will be any great reduction in the growth. We do not contemplate any great change in fodder crops.

Mr. J. H. Ritchie.—There is no prospect of any increase in fodder crops in the Central Provinces. Jowar is used as the main fodder in the cotton area, bhusa in the wheat tract and rice straw in the rice tract. Our Government farms produce berseem for our own cattle, but that practice has not been taken up by any one else and I see no prospect of any expansion.

Dr. W. Burns.—There are in Bombay 2½ million acres under fodder which is largely jowar and other crops that are grown and cut green. I think there are also great possibilities in pumping from rivers.

Mr. D. L. Drake-Brockman.—When we increase our area under linseed and sunayi it may be assumed that an increase in fodder grown specifically as such will have to be made. At the moment I see no need for any radical change.

Mr. A. McKerral.—In Burma, in the rice tracts cattle are fed with straw and in Upper Burma with jowar. In addition to these we have sesamum oil cake the produce of about 1½ million acres. On the irrigated areas fodder crops are not grown.

Mr. D. R. Sethi.—Sir, in Bihar, which is permanently settled, I do not think the Government can do very much to increase the area under fodder crops. We have about 33,000 acres under fodder at present, against a

total cattle population of about 29,000,000. They are fed on rice straw, wheat bhusa and gram, and I do not see that the cattle can be improved unless there is a definite incentive to the cultivator to grow fodder. It is very essential to have a market for Dairy products in order to improve the live-stock of the Province. A definite incentive should be given to the cultivator to grow fodder.

Chairman.—Do you suggest any incentive ?

Mr. D. R. Sethi.—It has been decided that the question of giving protection to dairy products should be referred to the Tariff Board. Protection, if given, will be a definite incentive.

Mr. C. R. Pawsey.—At present there is no area at all under fodder, but the Agricultural Department will do what they can to improve the position. They are trying experimental farms to improve the standard of live stock.

Mr. A. D. Gorwala.—The development of fodder crops in the Barrage areas of Sind may be expected to take place naturally as former waste lands and grazing areas are taken up for cultivation. It will be impracticable to impose any condition on purchasers or lessees of land that a certain percentage of the area shall necessarily be grown with fodder crops. Attempts are being made to extend the cultivation of berseem (Egyptian clover) both as a fodder crop and as an agent in the reclamation of *kalar* lands.

Chairman.—It is really in canal areas where the least quantity of fodder is grown, unless special provision is made by the Colonisation authority.

Mr. A. D. Gorwala.—Our rates are much lower than for any other crop, but we cannot hope to introduce any legislation to say that it shall necessarily be cultivated.

The Hon'ble Sir Frank Noyce.—Can Mr. Burt tell us what the Royal Commission on Agriculture recommended on this subject ?

Mr. B. C. Burt.—I remember the Royal Commission saying that there was very little progress possible in cattle improvement or dairying unless the feeding of cattle is improved and that an increase in the growing of fodder crops must take place.

The Hon'ble Sir Frank Noyce.—The Royal Commission on Agriculture recommended in regard to this as follows : (The Honourable Member read from paragraph 187 of the Report). I do not think there has been any change in the position since. I should be very sorry if this Conference were to lend any support to the theory that a very great expansion of cultivation of fodder crops in this country is not desirable not only for the proper maintenance of live stock but also for the expansion of the dairy industry.

Chairman.—I think the Conference is agreed on that point that it is desirable. The question is how to bring about that desirable condition. It has been recognised by the provinces, but they have stated that they are powerless unless they are given legislative powers.

The Hon'ble Sir Frank Noyce.—I would not agree with that. There are a great many things that the Agricultural Department can do to encourage any particular crop. I do not believe our Agricultural Departments are so powerless as all that.

Mr. P. B. Richards.—We have in the United Provinces 1,360,000 acres under fodder crops against the normal area of 927,000 acres in 1905. That is an increase of roughly 40 per cent.

Chairman.—In the meantime the total crop area must also have gone up.

Mr. P. B. Richards.—The crop area has increased to 35,044,000 from 34,803,000 acres in 1905, that is to say, it has remained practically stationary. We have heard that it is desirable that alternative crops approximately of equal value should be substituted for wheat. This Conference has made no recommendations, and I do not know if it intends to advise Local Governments upon the ways and means by which the Government can assist in such substitution. Sir Miles Irving has touched briefly upon the possibility of such inducement : This might be of the nature of lower irrigation rates, revenue operations by way of generous takavi advances, generous remissions in the case of failures where new crops are being established, etc. If any lead can be given by this Conference in the manner in which the substitution of crops can be encouraged by Governments, I think it would be of great help to the Agricultural Departments.

Mr. H. M. Hood.—The matter has been carefully considered by the Madras Government before we came here in regard to the substitution of other crops for paddy and the compulsory restriction of cultivation.

Chairman.—There has been no question of restriction and the question of substitution has also been reduced to one of simply carrying out the programmes of such Local Governments as have any programmes of change over. The only other thing is the question of linseed. There is no other definite recommendation for introducing any other crop.

Mr. H. M. Hood.—Governments can do something towards inducing ryots to grow a particular crop, but they can not do it by compulsion. The methods referred to by Mr. Richards are open to the Governments, but I think the influence of those methods is not quite so great as he suggests. It is possible to give land revenue remissions, but Land Revenue is not by any means a very big factor in deciding what crops a ryot will grow. Government can refuse to give remission if a crop which is not favoured is grown but this may operate harshly. The method of persuasion and propaganda through the Agricultural or Revenue Department is open to us and it is the policy that is being steadily pursued at present in Madras.

Col. A. Olver.—The most effective propaganda is to organise good markets for animal products and live stock.

Chairman.—I take it that the result of such information as has been elicited from representatives of Local Governments is that there is a desire all round to help a larger area coming under fodder crops, but success achieved hitherto has not been very great, that none of the Local Governments is contemplating taking powers to further this object ; they all intend utilising such influence as they happen to possess to promote this object.

The Hon'ble Sir Miles Irving.—The policy of our Agricultural Department has been generally speaking not to advise any course of action but to lay before the cultivator facts to enable him to decide.

Chairman.—There is no more effective influence than to show by example.

The Hon'ble Sir Miles Irving.—We try to avoid giving definite advice saying " Grow this ".

Dr. W. Burns.—I protest that that is a most hopeless way of doing propaganda.

Chairman.—Propaganda, you must recognise, must vary with reference to the character of the people on whom it is being exercised. Sir Miles Irving can show that in matters relating to agriculture his province has not done so very badly as to justify that the method of propaganda is not very effective.

We come to page 13, where there is a general omnibus sort of resolution that in order to promote a more efficient production and marketing of Indian agricultural produce this Sub-Committee recommends that the Government of India should consider the advisability of imposing protective duties on the imports of agricultural produce which compete with home grown produce.

The Hon'ble Sir Frank Noyce.—The Government of India would want a great deal more information before they are prepared to take action on this Resolution. If you look at page 27 of the Statistical Table, you will find that there are only four agricultural imports, rice, which we have dealt with separately, coconut oil and linseed oil which are already subject to a high duty and cotton which is also subject to duty. A great proportion of the linseed oil is made from linseed which is exported from this country and which comes back to it again from the United Kingdom. There is also tobacco which has not been mentioned on which there is already a duty. I am not quite clear why other agricultural imports such as tobacco have not been mentioned, but tobacco is also subject to a high duty, and I think it is very desirable that the Sub-Committee should explain for the benefit of Government what imports of agricultural produce they had in mind. We have separately dealt with the question of the dairy industry, and it seems to me that the whole field has already been covered, and that this Resolution is superfluous.

Mr. P. B. Richards.—When this Resolution was finally passed the two words " animal fats " were added before agricultural produce. This was included lest animal fats should compete against home grown products. The Chairman has called this an omnibus resolution. It is certainly an omnibus for the poor, the smaller agricultural industries and products. All the big things, more or less, have been provided for in separate resolutions, but there is a large number of smaller industries which may now or in the future require protection ; and therefore the resolution was framed in this manner. I will give a case in point from the United Provinces which applies throughout North India. We grow a large and increasing quantity of temperate fruits in the hills, of which the apple is the most important. These apples are sent all over India, Bombay and Calcutta being among the larger markets. It frequently happens that our growers in Kumaon Hills send apples of excellent quality to Bombay or Calcutta and find that they can not get the price of the box and the railway freight because of the dumping of apples from California. This is only a small case but there may be many more. We have merely asked in this Resolution that Government should take a favourable view of placing an import duty on such agricultural produce as competes in this way to the

disadvantage of local growers. It is not expected that a protective duty would be imposed on any article until those concerned have put their case before the Tariff Board, and all that is requested is a recommendation from this Committee to the Government of India that when such cases arise they will be given favourable consideration.

Chairman.—Then I can assure you it is superfluous, because as soon as an application comes to the Tariff Board, it is bound to be considered.

Mr. A. M. Livingstone.—With reference to Mr. Richards' last remark, when we dealt with fruits and vegetables there was no reference there to any question of import duties. So far as the United Kingdom is concerned, in regard to fruits and vegetables, the Import Duties Advisory Committee put on some heavy duties with the object of encouraging the production of fruit and vegetables in England, which are at present being imported from the Continent, with a considerable amount of success, and the Dutch and French systems of market gardening have since extended considerably, but when the duties were put, on the Import Duties Advisory Committee was very specific in saying that unless the Home producers took steps to improve the marketing of their produce, these duties would be removed, and that incentive has caused the producers to go in for better marketing both of fruits and vegetables. It has been very helpful indeed, and I think the intention of the Sub-Committee was that similar action by the Tariff Board in India would also be helpful. It is true that in this country there are no Farmers' Unions to make proper representations to the Board, and I think Mr. Richards and the supporters of this resolution felt that in the absence of any such body in India a general resolution to this effect might perhaps be helpful without going into specific details.

Chairman.—As pointed out by my Hon'ble colleague, Government like any other businesslike body, would be glad to deal with any particular case. The general principle of this resolution is admitted by the Government as the very existence of the Tariff Board implies. But the point has been raised by Mr. Livingstone that there are no Farmers' Unions in this country but he is going to be the head of the Marketing Board, and I should think the Marketing Board of a province would be the most appropriate body to move in the matter of drawing attention of the Government to facts which justify an inquiry. I do not know whether members of the Conference are keen that a resolution in such general terms should be adopted. The discussion has taken place and that will serve the purpose. Is that a fairly accurate interpretation of the wishes of the Conference ?

Mr. H. M. Hood.—The resolution seems rather unnecessary.

Chairman.—That is what in a more parliamentary language I tried to say.

Well, now, we will proceed to the next one,—to improve agricultural statistics.

Dr. D. B. Meek.—A few years ago we addressed various Local Governments and commercial bodies regarding the possibility of re-starting the statistics relating to sea and rail-borne trade. The proposal was then accepted by the Provincial Governments and by representatives of commercial bodies. Now, I am in full sympathy with giving more information to provinces, but it will cost some money for the collection and

compilation of these figures in a much more detailed form. If this resolution comes to the Government of India, it will be examined, but it will be examined mainly from the point of finance, and I understand that some of the Local Governments will be willing to assist us financially. One of the Local Governments has actually kept up the system of rail-borne and trade statistics right from the year 1922 up to date. I should like to know how far the Local Governments and commercial representatives would be willing to assist us in meeting the additional expenditure. Central Provinces I understand has kept the statistics up-to-date from 1922 onwards.

Mr. H. M. Hood.—I cannot say whether our Government will or will not be willing to find the money.

Dr. D. B. Meek.—If the resolution comes to me, I will consult the Local Governments and indicate what the cost will be.

Chairman.—Gentlemen, we have spent two mornings here, and we have got through a very well considered Note by our experts from all over India. It is a matter of very great satisfaction to me to see that in each province the Agricultural Department has been functioning with great zeal and enthusiasm and effect. People were under the impression that cropping and all these things in the provinces have been going on anyhow, there was no logic behind them, that there was no sense behind them perhaps and at all events there were no economics behind them. A reference to the proceedings of the Advisory Committee of experts and to all this extensive material that has been collected by the Council of Agricultural Research and our experts at the headquarters will show that for many years in the past provinces have been doing their very best to see that every acre of land is being used by the ryots and cultivators to as good a purpose as local conditions permitted. After an exhaustive inquiry spreading over three days, our experts came to the conclusion that as regards the cropping of the largest staple products, rice and wheat, they were not in a position to say that there was too much of cultivation. Therefore, the proceedings of this Conference and its conclusions will convince the public and the cultivator that as a matter of fact we are not in a position to say that the cultivation of these two large staple crops of the country should be restricted. We are at the same time in a position, after examination of all the material, to say that further expansion of these two crops can only be undertaken by provinces in the light of the facts which have been elicited during these investigations, because we all know that circumstances and economic conditions change very rapidly and the changes of weather and rainfall and storms play a part which has a very important bearing on the development of cultivator's character and his faith in Providence. Only the other day we heard what had happened in America when a storm came. We thought that all their wheat was exhausted and perhaps India would once more be a wheat exporting country. So we can never know that the existing conditions are going to continue for any length of time ; but it is a matter of very great satisfaction to know that you have not been going very wrong. It is a still greater satisfaction to know that in the main you have been doing very well.

Then coming to substitute crops, I think we have definitely scored a point in feeling satisfied that about 2 million more acres could be brought profitably under linseed. About the other substitute crops they are not very much, but still our investigations, our deliberations have been a

source of very great satisfaction to me and to my colleagues, and I trust they have been of equal satisfaction to representatives of provinces, because one does not like to feel that one has been bungling matters or mismanaging them although one would always like to improve matters if possible. There are some matters which have not yet been finally investigated. Provision has been made for investigations to be pursued in relation to those matters, and as soon as those investigations have been completed the results of those investigations will be circulated to all the provinces. These Conferences no doubt involve a great deal of trouble to provinces to send their representatives to them. But I feel after these two days' deliberations that we have been justified in giving this trouble to the provinces, in our own interests and I trust as well as in their interests. Therefore I will not apologise to you for giving you the trouble to come, for I feel that the gain on both sides has been such as to justify my giving the trouble and your being good enough to take the trouble to come. (Cheers.)

Rao Bahadur C. Tadulinga Mudaliar.—May I be permitted to express on behalf of this Conference our sincere feelings of thankfulness to the Vice-Chairman of the Imperial Council of Agricultural Research and his Statistician Professor Vaidyanathan for the trouble they have taken in placing before us these very interesting statistics and graphs. I have no doubt that they have been prepared by them at a certain amount of personal sacrifice, and I hope all the members of this Conference will agree with me in thanking them for the same.

Chairman.—Certainly.

Rao Bahadur C. Tadulinga Mudaliar.—May I also have the proud privilege this afternoon to express our feelings of gratitude to you, Sir, for the hearty welcome you have extended to us at the beginning of this Conference and the kind hospitality you have shown us during our stay at this hill station ? Also I may be permitted to propose a very sincere and hearty vote of thanks to you for so smoothly guiding the deliberations of this Conference and bringing it to a very successful end. (Cheers.)

The Conference then dispersed.

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PROCEEDINGS

OF THE

WHEAT CONFERENCE

Held at Simla, on Thursday, May 10th, 1934.

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List of persons attending the Wheat Conference, May 1934.

Government of India—

(1) The Honourable Khan Bahadur Mian Sir FAZL-I-HUSAIN, K.C.S.I., K.C.I.E., Kt., Member in charge of the Department of Education, Health and Lands.

(2) The Honourable Sir JOSEPH BHORE, K.C.S.I., K.C.I.E., C.B.E., I.C.S., Member in charge of Railway and Commerce Departments.

(3) The Honourable Sir FRANK NOYCE, Kt., C.S.I., C.B.E., I.C.S., Member in charge of Industries and Labour Department.

(4) The Honourable Sir JAMES GRIGG, K.C.B., Member in charge of the Finance Department.

(5) Sir ALAN PARSONS, C.I.E., I.C.S., Secretary to the Government of India, Finance Department.

(6) Dewan Bahadur Sir T. VIJAYARAGHAVACHARYA, K.B.E., Vice-Chairman, Imperial Council of Agricultural Research.

(7) Mr. G. S. BAJPAI, C.I.E., C.B.E., I.C.S., Secretary to the Government of India, Department of Education, Health and Lands.

(8) Mr. RAM CHANDRA, C.I.E., M.B.E., I.C.S., Joint Secretary to the Government of India, Department of Education, Health and Lands.

(9) Dr. W. MCRAE, D.Sc., Offg. Agricultural Expert, Imperial Council of Agricultural Research.

(10) Mr. M. S. A. HYDARI, I.C.S., Deputy Secretary to the Government of India, Department of Education, Health and Lands.

(11) Dr. D. B. MEEK, C.I.E., O.B.E., D.Sc., Director General of Commercial Intelligence and Statistics.

(12) Mr. N. D. CALDER, Director of Traffic, Railway Department.

(13) Mr. J. B. SHEARER, I.C.S., Under Secretary to the Government of India, Finance Department.

(14) Mr. A. M. LIVINGSTONE, Marketing Expert, Imperial Council of Agricultural Research.

(15) Mr M. VAIDYANATHAN, Statistician, Imperial Council of Agricultural Research.

Bombay—

(16) Mr. W. J. JENKINS, Chief Agricultural Officer, Sind.

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United Provinces—

(17) Mr. P. M. KHAREGAT, I.C.S., Secretary to the Government of the United Provinces, Agriculture Department.

Punjab—

(18) The Honourable Sir JOGENDRA SINGH, Kt., Minister, Agriculture, Punjab.

(19) The Honourable Mr. D. J. BOYD, C.I.E., I.C.S., Finance Member, Punjab.

(20) Khan Bahadur Maulvi FATEH-UD-DIN, Officiating Director of Agriculture, Punjab.

Central Provinces—

(21) Mr. R. N. BANERJEE, I.C.S., Revenue Secretary to the Government of the Central Provinces.

(22) Mr. J. H. RITCHIE, Director of Agriculture, Central Provinces.

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Proceedings of the Wheat Conference, held at Simla on Thursday, the 10th May, 1934.

The Conference met in the Members' Room in the Assembly Building at 11 A.M., with the Honourable Mian Sir Fazl-i-Husain in the Chair.

The Chairman in opening the Conference said :

I must first welcome the representatives of provinces who have come from long distances after taking a troublesome journey, unpleasant in these days at sacrifice of time and comfort. I would not have ventured to give you that trouble but for the encouragement received from you in answer to a question put to provinces—the wheat producing provinces—whether under existing circumstances they would like to have a consultation between themselves to study the present day troublesome problem of wheat prices. The response was such that it resulted in our inviting you to come here and consider this difficult but at the same time very important problem. What is it that is peculiar about the wheat problem to-day ? There are two things which are peculiar about wheat as compared with other agricultural products. Firstly, wheat is the one thing for which they have had, I believe, separate international conferences. I believe a wheat conference is sitting in London now and there is something peculiar about wheat, that is very elusive. They did not come to any conclusion last time and such reports as have been received about the wheat conference that is proceeding in London now do not seem to be very encouraging so far as arriving at results is concerned. The second thing about wheat in India is that we are more or less isolated. There is no import of wheat because of the Wheat Act of 1931 and there is no export because for some years our prices have been above world parity. These are, so far as I can see, peculiar features about the wheat problem in India. Internationally we are out of it. Within India we are so to speak controlling home markets. Then there are three questions which I should like to be considered in the light of the statistics that have been provided and in the light of such information as representatives of the wheat producing provinces may possess. The first question is,—is it a fact that the fall in the case of wheat prices in India is greater than the fall in the prices of other agricultural products in wheat producing provinces ? Statement No. VI and Graph No. V, I believe, deal with this. That is the first question which probably you would like to consider. The second question is, how are wheat prices governed in the different provinces in India ? What determines them ? It will be noticed that there is considerable variation between the wheat prices in different provinces. Is it due to the supply in that province and the demand in that province ? Is it due to railway freight and incidental charges from the different wheat producing centres to the consuming places, or is there any other reason ? Statement No. X, I believe, is relevant to this question. And the third question which arises is, does the wheat produce of a year bear any direct and definite relationship to the price of wheat during that year, taking into account such stocks as may have been handed down from the preceding year ? This question concerns the all-India basis as well as the provincial basis. Statements

No. I, V and VI, I believe, bear on this question. A correct appreciation of these three, what I may call fact finding questions, will help us in understanding the problem which we have to face. With your permission I will proceed straightaway to state what the problem is. The problem is this, that according to our latest wheat produce forecast, we are in for nearly 10 million tons of wheat and including what we believe we have in hand, we are in for about 10.5 million tons of wheat. We are told that our normal consumption of wheat is about 9 million tons. Therefore we are 1.5 million tons in excess of our actual requirements. That is one fact. At all events that is the estimate. I may mention here casually that our facts are really estimates. In other matters you make estimates and then next year you have a chance of verifying them. Then you come to what I might call actuals but so far as I have been able to gather in these things we are always at estimates and never at actuals. Experts will perhaps be able to tell me when the discussion is carried on whether there are any actuals at any time, with the help of which we can verify our estimates or correct them. Well, we have here 10.5 million tons according to our estimates available for consumption and our consuming capacity is only 9. What should be the price, under the circumstances, of wheat ? That is really the problem. A glance at these statistics will show that we were presented with just 10.5 million tons of wheat in 1930 and the prices were very good. In 1931, we had probably 9.3 million tons produce and the price went down to Re. 1-7-0. In the next year the produce was 9.6 million tons and the price was a little higher. In the next year it was 9.5 and the prices still went high. Therefore to a layman it would appear that when the produce was 10.5, the price was very high. When it was considerably less than 10.5 the prices fell down. When it was a little higher, the price rose a little, but when it was considerably higher, the price also was higher. Therefore it is difficult to deduce from these facts the conclusion, the larger the output, the lower the price. Still it is a very arguable point and no doubt discussion will be most useful on this point. I need hardly add that so far as the importance of prices go, it means a matter of about 40 to 45 crores one way or the other. If the prices are on the basis of 1933, the producer, the land owner and the Government stand to gain very considerably. If the prices are of 1931 and 1932, they lose by about half and the consumer to that extent gains. Then very closely connected with this is the problem of the agency which operates in *mandis* and which directly or indirectly has a hand in fixing prices. No doubt a close and intimate knowledge of this organisation will enable one to judge to what extent its operation is fair and above board or is due to chance and defective knowledge and to what extent this organisation can be made to act in a fair and equitable and reasonable manner. These are really the two problems and I have indicated those questions with the sole object of leading on to the solution of these problems. I should not say that we must solve them. It may be that after discussing the whole matter very thoroughly we find that there is some further investigation to take place before we can solve them. However I feel confident that whether we solve the problems or not we will have gained in knowledge and experience and if we do not find a solution we shall certainly be nearer the solution at the end of the discussion than we are at present.

Honourable Mr. D. J. Boyd.—Might I ask Maulvi Fateh-ud-din to explain the method by which prices are fixed in the *mandis* of the Punjab ?

Maulvi Fateh-ud-din.—Prices for wheat are fixed in the *mandis* as follows. The grower brings his produce to the market and it is heaped in front of his commission agent's shop. In the afternoon the buyers and their brokers come along and an auction is held at each heap. Of course it is all done secretly. There are very few *mandis* in the Punjab where open auctions are held. The bids between the broker of the buyer and the commission agent of the seller are secret, until some understanding is arrived at and that is the price fixed for that heap. After the day's transaction these commission agents get together and find out the average price paid in the day and that is the market price for the day. And that price forms the basis for the transactions on the following day, though it does not govern them. And that price is telephoned or telegraphed to other *mandis* in the province.

Honourable Mr. D. J. Boyd.—The *mandis* mainly concerned are Lyallpur, Okara, Amritsar, to some extent Ludhiana, and Hapur and Muzaffarnagar, the latter two being in the United Provinces, but also governing Punjab prices. The dealers in these different *mandis* exchange telephonic communication in the morning regarding the prices arrived at on the previous day, and those form the starting price for the next day. Also communication is made regarding stocks in the *mandis* and stocks coming in. On that the brokers of the dealers make their bargains, generally secretly, as described by Maulvi Fateh-ud-din.

Chairman.—Are the buyers mainly middlemen or actual buyers ?

Honourable Mr. D. J. Boyd.—Mainly middlemen. Firms like Owen Roberts would probably have their own buyers in the *mandis* and buy direct.

Chairman.—But have not people like that ceased to be buyers since export was stopped ?

Honourable Mr. D. J. Boyd.—They buy for the army. Then of course the prices are tremendously upset by gambling. In Amritsar we have two exchanges that have upset prices very badly indeed. It is really a process of *satta* gambling that goes on in these exchanges. The exchanges themselves stand to win every time because they merely record transactions and take commissions, and the people who win or lose are those who offer to buy or sell wheat. Fortunes are won and lost on these exchanges. We are not quite sure that they ought not to be suppressed and are watching them. In recent months they have not been prominent, but last year their dealings were on such a large scale that you could not get along the streets of Amritsar where they have their offices and we were a good deal perturbed. On the whole, however, the effect seems to be to raise the price a little and therefore as a province we do not object. But a bad crash is bound to come sooner or later. We expected it last December and a few crashes did come but not on the scale we expected. On the other hand we found one peculiarity, that wheat was travelling backwards and forwards between Lahore and Amritsar.

As regards our harvest this year I should say we are beginning to suspect that the outturn will be 10 per cent. less than we estimated. The crop is not threshing out well. The late wheat is producing a lot of shrivelled grain, and the estimate of the British Cotton Growing Association, based on definite experiments in their own threshing, is that it is

likely to be 10 per cent. below estimate both for irrigated and unirrigated land. That we suspect has got round the *mandis* and we think it is helping to keep prices firm. But we are terribly troubled. I have here several notes written by an extremely able officer, Mr. Puckle, who was put on special duty for a few weeks before going on leave. He had ample leisure and opportunity for working out this wheat problem. His notes are very valuable, but at the end of every one he has to confess that it is practically guess work. The stopping of the Indian rail-borne statistics in 1922 was a tragedy of the very first order. If we had them then there would be only one unknown factor, consumption. We have had several guesses made at consumption by the Board of Economic Inquiry and by individuals, and we really do not know much about it. I propose this next year to get the Board of Economic Inquiry to take a series of years and to try and arrive at some standard of consumption. When we have got that, with the figures we now get from the Indian rail-borne statistics, I think we will arrive at some certainty. But at present the outturn of prices and production and consumption leaves you simply bewildered, and what the disturbing factors are it is very difficult to say. One factor is the enormous increase in population. During the last decennium the area has increased by 6 per cent., whereas the population has increased 10 per cent., so that the increase in population is outstripping the area under wheat and wheat is the staple food of the population. That is a very favourable factor, and also the spread of the habit of eating wheat all over India. There is still room for it to spread in the Punjab and a good deal of room in other parts of India. That also is a very favourable factor.

Chairman.—Statement No. IX, column 3, shows the progressive consumption since 1921. Does that reflect the increase in population ?

Honourable Mr. D. J. Boyd.—How is that figure arrived at ?

Mr. Vaidyanathan explained that the only method possible for calculating stocks is to fit in a straight line to the figures of ' balance available for consumption ' for a series of years, from which the trend of annual consumption can be deduced, and the progressive annual stocks calculated. This is the method adopted in all Economic studies in American Universities.

Honourable Mr. D. J. Boyd.—There is one other factor which to my mind is very serious. We have got the wheat agreement binding 22 countries of the world. That agreement is merely an agreement not to export beyond a certain quantity. In order to implement that agreement they have to restrict their production. In this country we are doing exactly the reverse. We are increasing it as hard as ever we can with the Sukkur Barrage, and that is I think where the menace, at any rate for the Punjab, comes in. I do not suppose we can stop wheat growing in the Sukkur Barrage, but it is extremely unfortunate that it should have occurred at a time of agricultural depression.

Chairman.—I should like to know what Sind thinks of this.

Mr. Jenkins.—After what the last speaker has said, I feel myself rather in the position of the farmer hanging himself in expectation of plenty. When I left Karachi on the 7th May the price of wheat was Rs. 21-12-0 per candy of 656 pounds. This price is as high as the price of wheat anywhere else in the civilised world, and is certainly greater

than the price of wheat at the ports of any producing or exporting country. Therefore, it is obvious that we must consider this question in the light of a probable fall in prices as the Chairman has said, on account of the large crop this year. Owing to the parity of wheat prices in India which are much above world prices there is absolutely no chance of any export of wheat. I think I am right in saying that not a single ton of wheat has been exported to Europe during the last two years from Karachi. As has been pointed out, the wheat crop this year promises to be considerably in excess of normal consumption, and therefore it seems to me that the problem we have to consider is what means can be adopted to increase wheat consumption in India. I am very much opposed to any suggestion of restriction of area. Restriction of area is practicable and can be put into effect in large prairie countries where wheat is grown on an enormous scale, but in India where it is produced by millions of small cultivators and constitutes a large part of their agriculture, I think any attempt to restrict cultivation and thereby reduce the wealth of the country is not at all to be advised. In Sind, under the Lloyd Barrage, we have a very large area under wheat this year.

Chairman.—Could you tell us what is the area ?

Mr. Jenkins.—1.07 million acres, and, with future development of the area under the Sukkur Barrage it is anticipated that this figure will reach 2 million acres. That means adding another half a million tons to the present 1½ millon tons estimated to be surplus to India's consumption. At the beginning the Chairman asked three questions. Is it a fact that the fall in wheat prices as compared with other agricultural products is greater in wheat producing provinces ? We have got figures prepared by the Imperial Council of Agricultural Research Statistician, and personally, taking the next important grain crop in Sind, namely, rice, I do not think that the fall in wheat prices is any greater than the fall in rice prices. Probably, in Sind the fall in the price of rice has been larger. While I am dealing with this question I should like to emphasise the inter-dependence of these two crops from the standpoint of consumption and to point out that, in my opinion, one of the reasons which is militating against an increased consumption of wheat in India is the large quantity of cheap rice which is being brought into this country from Burma. I was informed before I left Karachi by a certain wheat trader that certain parts of India where they normally used to send 50,000 tons of wheat now take only 20,000 tons. The reason for this decrease, they unanimously said, was due to the cheap rice produced in India, and even to a greater extent to the cheaper rice imported into India from Burma.

Chairman.—But Burma is India.

Mr. Jenkins.—Well, imported from one part of India to another. I understand that there are 5 million tons of surplus rice in Burma, and so I do not think we are at the end of this flooding of our markets with Burmese rice. In considering the question of increase in consumption which I think is the only possible method of dealing with this problem, I would like to go on to the question of railway freights, which I think is an important factor in the solution of the question which we are discussing. The freight rates at present charged on wheat in the Punjab and Sind are, in my opinion, and I think in most peoples' opinion, totally dis-

proportionate to the value of the produce. (At this stage the member gave different freight figures.) The result of this has been to reduce considerably exports of wheat by rail from the Punjab to Karachi, and although this may at first sight seem to benefit our friends in the Punjab I should like to point out that it does not, because it limits the area from which buyers make their purchases, and Karachi has been, and by its position will continue to be, the main central wheat market for India. I have also the authority of the trade in Karachi for stating that large buyers in Calcutta prefer to make wheat purchases in Karachi and to maintain large stocks there, but owing to the excessive freight rates they are at present prohibited from doing so. The result is that instead of purchasing a lakh of tons, storing it in Karachi and shipping to Calcutta when required, they buy much smaller amounts from the *mandis* in the Punjab. Another effect which the high freights have is to restrict the movement of wheat, and I believe that the first step towards obtaining an increased consumption is to induce an increased movement of the crop especially in the earlier months. A general reduction in freight charges when the wheat is moving or tends to move would increase that movement and would tend to raise prices. I would like to emphasise, and I have the authority of my Government for saying so, that any reduction in freights should not be discriminatory but should be applied over all railways. The Bombay Government are definitely opposed to any proposal which would tend to divert trade from Sind, and the reduction of the freight rate from the Punjab to Calcutta and Bombay has tended to stop the movement of wheat from the Punjab to Karachi which I think is detrimental to the interests of the cultivator and certainly so to the interests of the consumer and the trader. There are other forms of Government intervention in attempts to raise wheat prices. We have the unfortunate example of the United States Government through the Federal Farm Board which attempted to regulate the price of wheat and which resulted in a colossal failure. This helped nobody, and must have cost the United States Government a very large sum of money. I do not think that anything of that sort can be contemplated here. Certain countries, such as Argentine, France and Germany, have endeavoured to raise their internal wheat prices by a system of bounties on exports. That is entirely out of the question in India at present, because we have no export and as long as our prices remain so much above world parity there is no chance of any export. This brings me back again to my original contention that the only method of dealing with this question is by fostering consumption in this country, and that, I maintain, can be done by a general and indiscriminatory reduction in freight rates, and by starting a publicity campaign on " Eat more wheat " lines.

Chairman.—What particular grain would you recommend to throw out of consumption ? You cannot expect people to eat more wheat without giving up eating something else that they are eating.

Mr. Jenkins.—Personally I think some of the inferior millets or even rice can be replaced by wheat as a staple food. It would be altogether in the interest of the country and the physique of its inhabitants. Rice is of course a very important food crop but in Sind we are doing our very best to discourage any large increase of rice cultivation.

Chairman.—You are differently situated from Madras and Bengal.

Mr. Jenkins.—Yes.

(To Sir Alan Parsons) When I referred to reduction of freight without discrimination, I meant that no particular place is to have any preferential rate. I want a percentage reduction. I understand that the freight on wheat is at present on a schedule rate on the railway according to the distance which it is taken.

Mr. Calder.—The reason for the reduction in the rates from the Punjab to Calcutta is because of the competition by sea *via* Karachi.

Chairman.—Your point is that the freight from Lyallpur to Calcutta by rail is less than the freight from Lyallpur to Karachi and from Karachi to Calcutta by sea ?

Mr. Jenkins.—Yes.

Chairman.—Is that so ?

Mr. Calder.—Yes.

Chairman.—Will you kindly turn to Statement No. X ?

Lyallpur to Calcutta by rail is Rs. 1-0-4, and Lyallpur to Karachi is Re. 0-11-8, while from Karachi to Calcutta is Re. 0-5-9. Therefore the freight from Lyallpur to Calcutta *via* Karachi is Re. 0-11-8 *plus* Re. 0-5-9 or Rs. 1-1-5.

Mr. Jenkins.—You have also handling and transhipping charges *via* Karachi to be added to it.

Mr. Calder.—That was taken into consideration when the rate was fixed. From the information we have, we reckon that the new rates to Calcutta are cheaper than the rail *cum* sea rates.

Chairman.—As a matter of fact during the last year the consumption in Calcutta of wheat has not been very great. How is it that provinces other than the Punjab have been feeding Calcutta to a greater extent than in the past ? How is that I do not understand.

Hon'ble Mr. D. J. Boyd.—We have worked on the understanding that Bihar supplies the United Provinces.

Dr. Meek.—I understand, Sir, also that the production of flour in Sind has fallen considerably.

Chairman.—I am going to look into that.

Hon'ble Sir Frank Noyce.—The United Provinces is self-supporting as regards wheat.

Chairman.—I should like to know from the Central Provinces representative whether there is a great deal of wheat in the province.

Mr. Ritchie.—There is.

Hon'ble Sir Frank Noyce.—Do your consumption and production in Central Provinces balance ?

Mr. Banerjee.—Yes, Sir.

Mr. Ritchie.—That is with a 10½ anna crop and an acreage of 3,400,000.

Chairman.—Our figures are not correct.

Mr. Banerjee.—Our normal consumption is 625 to 650 thousand tons and with this outturn and acreage we get an equilibrium between consump-

tion and production. Part of our wheat from the wheat growing areas goes to the non-wheat growing areas.

Hon'ble Sir Frank Noyce (to Punjab representatives).—You are anticipating an outturn of 10 per cent. less than the forecast. That will mean a decrease of three hundred thousand tons. I wonder whether the other provinces are anticipating a similar decrease as compared with the forecast.

Mr. Kharegat.—The United Provinces are.

Hon'ble Sir Frank Noyce.—That means about half a million tons less than was anticipated. That is satisfactory.

Hon'ble Sir Jogendra Singh.—I think that the problem is a difficult one and not only a difficult one but a very important one. As the Chairman pointed out, the margin of profit has almost vanished and cultivators have neither the purchasing power nor the money available. If you want the villagers to meet their taxation and other money demands, money must be pushed into circulation. But it is not a problem of one crop only. As Mr. Jenkins from Sind pointed out, prices are interdependent and crops are also interdependent. Cereals of all kinds are sold at various places and the prices are governed more or less by supply and demand of all the cereals. So far as our information goes money plays an important part in regulating prices and therefore to regulate prices management of money in various countries began. Now it is difficult to know what our money is, and I am sorry the Hon'ble the Finance Member is not here—because he could help a little in raising the level of prices or keeping them at their present level. I think if we are to begin raising the general level of prices, we have to look into the money requirements of our population. How much money a man needs and how much money is put in his hands both for paying his taxes and meeting his other demands. Till you go into his fundamental question, it is impossible to tackle the question of prices. You have got all the consumption figures and we have gone carefully into these. The quota of wheat per head of population in the last decade has been reduced between the last census and the present census in the Punjab from 4.1 to 3.9 and the prices have gone down. So far as our trade was concerned up to 1921, Karachi used to take 60.30 per cent. of our produce and 30 per cent. went to the United Provinces and Sind. There are now no exports from Karachi. The surplus produce now is consumed either in the province itself or in other provinces. There is the question of developing the home market as Mr. Jenkins, said, and as you said, Sir, we cannot develop the home market for wheat unless wheat is to replace some other cereal. There is one factor, Sir, which I think needs further examination. General Megaw in a very interesting statement that he made in a speech in England said that a very large proportion of our population was not properly nourished. If that is so, then there is good market available.

Chairman.—You suggest that the people want nourishment.

Hon'ble Sir Jogendra Singh.—Yes. If we increase the purchasing power, people will eat more wheat and get better nourished. In the matter of raising prices in India, I should be very grateful if Mr. Livingstone, who comes fresh from the Ministry of Agriculture, could tell us what they have been doing in England in raising prices and in fixing the prices of various commodities and how they have regulated them.

If other countries are raising the price of home produce, I think, we cannot stand still. We might as well call for further information on two points. The first is the price of a unit of labour in India as compared with the price of a unit of labour in other countries.

Chairman.—Well, if I may interrupt, to-day we are meeting to deal with the question of the 1934 wheat, some of which is already in our hands and the other threatens to come on our hands within the next few weeks. The question that you have raised will be the question which, I hope, we will be able to discuss next month when we have the crop planning Conference dealing with all crops but we cannot go into all these things to-day in order to see whether something can be done in the immediate present for the current wheat crop.

The fall is relatively greater in the Punjab. How is the position in the United Provinces ?

Mr. Kharegat.—Prices have all fallen, more or less in about the same proportion. There is no appreciable difference. The most important point is that within the last fortnight or three weeks the price of wheat has risen very considerably. It went up in the last fortnight of April from 18 seers to 16 seers and in the first week of May it went up to 14½ seers but the moment they heard about this conference, the price dropped again to 15¼ seers.

Mr. Jenkins.—In Karachi the use is evidently due to the manipulation of the Marwari group at Hapur. That is an additional argument for facilitating the early movement of the crop. In Karachi they anticipate that the collapse will come much sooner than October.

Hon'ble Mr. D. J. Boyd.—In Punjab it has not dropped so much.

Mr. Banerjee.—In Central Provinces the price has not fallen as much as that of rice and jowar.

Chairman.—We come now to the second question of prices in different provinces, Statement No. VI.

Mr. Jenkins.—Statement No. VI gives the price of wheat in different provinces. It is rather interesting to notice that the average price of wheat for the whole of India is in the vicinity of Rs. 2-7-0 per maund. If the cultivator is getting Rs. 2-7-0 per maund, there would be no reason to complain at all. It is lowest in Bombay and in the Punjab it is Rs. 1-14-0. It is highest in Bihar and Orissa. I would suggest that an examination of the causes of these differences might lead to some useful result. The figures are given in the first column of Statement No. VI, where the harvest prices in different provinces are given. The average of these figures for the whole of India is 2.7 per maund. If you can stimulate the future trade by enabling stocks to be held in Karachi.....

Chairman.—Stocks in Karachi could be held only for the benefit of Bombay and Calcutta and for no other reason.

Mr. Calder.—The consumption is about 120,000 tons in Calcutta.

Hon'ble Mr. D. J. Boyd.—It is certainly much more than that. It is about 240,000.

Mr. Calder.—You guaranteed about 2.250 tons of wheat per week. I remember that figure. Our point was that any reduction in the rail rate

would not increase total despatches to Calcutta. The Punjab Government guaranteed the rebate scheme.

Chairman.—Let us turn to Statement No. VI. During the last four years I find that there has been considerable variation except in one or two cases. The Central Provinces shows the least variation—Rs. 2-4-0, Rs. 2-12-0, Rs. 2-6-0 and Rs. 2-7-0. When we come to Bihar the variation is considerable—Rs. 3-9-0, Rs. 3-8-0 and then all of a sudden it comes to Rs. 2-14-0. During the first three years they remained firm. Now, the difference between the Punjab and the North-West Frontier Province is not quite intelligible to me. I suppose the figures for the North-West Frontier Province are of the last three years.

Hon'ble Mr. D. J. Boyd.—I do not know enough about their production.

Chairman.—I believe their production is in excess of their consumption.

Hon'ble Mr. D. J. Boyd.—In some of the northern districts of the Punjab the prices were definitely higher than at Lyallpur for the whole season.

Chairman.—Mianwali does not produce much wheat ?

Hon'ble Mr. D. J. Boyd.—I would not have thought so but the last figures show that it did.

Chairman.—It seems to me from the discussion that we have had on this question No. 2 that the following points emerge :

that the uniformity of rate in the Central Provinces during the last four years is due to the province being self-supporting and that it has been generally balancing its demand and supply.

Hon'ble Sir Frank Noyce.—I take it, that is also true of the United Provinces.

Mr. P. M. Kharegat.—The figures show that there has not been very much variation.

Chairman.—You are soaring high, the price even now is Rs. 2-9-0, while next door to you in the Punjab it is Rs. 1-14-0. Bihar also has been enjoying high prices, in the current year and during the previous three years prices are much in excess of prices in any other province. Prices in the North-West Frontier Province are not quite intelligible, and the prices in Sind, on account of expansion of wheat production due to the Sukkur Barrage, tend to get assimilated to Lyallpur prices. So Sukkur and Lyallpur seem to be getting nearer to each other. As for the Punjab, is there an explanation why in 1930 the price was as high as Rs. 3 and why in 1931 it went down to Rs. 1-9-0, and why it rose to Rs. 2-11-0 in 1933 ?

Mr. Jenkins.—It rose again because the prices came to export parity and wheat started to move abroad.

Chairman.—That was in 1930-31. What about 1933 ?

Hon'ble Mr. D. J. Boyd.—In 1933 we started without any stocks.

Chairman.—But the excess previously was not more than usual. And if you are right and Mr. Kharegat is right, and a 10 per cent. fall in production is expected this year, then really you are going to produce 9 millions only, which is no more than is required for internal consumption.

Hon'ble Mr. D. J. Boyd.—We have started with some stocks this year.

Chairman.—Only 6. It is not a large figure.

Hon'ble Mr. D. J. Boyd.—Exactly a year ago I was discussing wheat prices with Mr. William Roberts. He is very much interested because he sells a tremendous quantity and he said to me that next harvest the price of wheat in the Punjab so far as he could see would go down to Rs. 1-7-0 and he was right. Actually in Gujranwala one day it was Rs. 1-4-0. And the reason he gave was the enormous acreage coming under wheat in Sind. He said the Punjab prices were bound to slump.

Chairman.—How does that work out ? How was Punjab wheat excluded by Sind ?

Hon'ble Mr. D. J. Boyd.—We have figures definitely showing that our export to Karachi has gone down most terribly. We used to export in quite recent years 400,000 tons, and that has gone down to 150,000 tons, and we expect that to disappear. We are really in a very parlous condition owing to the growth of the Sukkur Barrage.

Mr. Jenkins.—I think there is another thing to be considered and that is the question of flour. This import duty on wheat, while protecting the cultivator, is a definite disadvantage to the flour mills?

Chairman.—That is a separate problem and as I have intimated, we are going to have a look into it. Perhaps Dr. Meek can give us the total flour exported.

Dr. Meek.—I have not got the figure here, but it is said to be falling off.

Chairman.—That was anticipated. Then you attribute the depression of wheat prices in the Punjab to the development of the Sukkur Barrage ?

Hon'ble Mr. D. J. Boyd.—That is the only reason we can find.

Mr. Jenkins.—If that is the case, how does Mr. Boyd explain the fall in 1931 before the wheat area in Sind started to develop into the Barrage ?

Hon'ble Mr. D. J. Boyd.—In 1931 the slump began all over the world, a very much wider cause than anything like this.

Mr. Jenkins.—But is that not a more important reason even now rather than the development in Sind ?

Hon'ble Mr. D. J. Boyd.—Yes, but at the same time you have given us some figures of the Punjab imports showing how they have gone down in simply a catastrophic way, entirely due to the fact that you get most of what you want from Sind.

Mr. Jenkins.—I think that might also be due to railway freights prohibiting imports. If they were reduced I think the imports into Karachi would be as big as ever they were.

Chairman.—But why should they get it from Lyallpur when they can get it from Sukkur to Karachi at about 4 annas less.

Hon'ble Sir Frank Noyce.—After all, you are getting anything from 150 to 200,000 tons from Sind. I do not see what a reduction in railway freight from the Punjab to Karachi is going to do. You have got 150,000 tons in Sind, and that makes all the difference to the Punjab.

Hon'ble Mr. D. J. Boyd.—I hope, Sir Frank Noyce, you will not discourage any proposal for the reduction of freight from Lyallpur to Karachi.

Chairman.—But what is the object of it ?

Hon'ble Mr. D. J. Boyd.—Well, we could compete a little bit better with Sind.

Chairman.—But how could you ? Sind is ahead of you by the distance between Lyallpur and Sukkur.

Hon'ble Sir Joseph Bhore.—It is a permanent handicap.

Chairman.—Yes. Therefore you cannot by reduction of freight only produce any result, unless you correspondingly increase the freight from Sukkur to Karachi, a position it would be difficult to maintain for any length of time.

Hon'ble Mr. D. J. Boyd.—The longer the distance the less the freight ! Well, if this reduction goes a certain length the difference will be reduced very considerably. It will give us a chance of competing. I admit that it cannot help us permanently.

Chairman.—I think you had better push on with a wheat-eating propaganda in Sind itself.

Mr. Jenkins.—It is rather difficult to encourage people to eat wheat and at the same time raise the price of it, especially when rice is so cheap. Another effect will be, if wheat prices go up, that a bigger acreage will go down.

Hon'ble Mr. D. J. Boyd.—Actually we can only see two possible ways out. One is to increase the internal demand for wheat, and the other is to stop any increase in area under wheat.

Chairman.—There has been no increase in the irrigated area under wheat during the last 3 years in the Punjab.

Hon'ble Mr. D. J. Boyd.—We are at a stage of equilibrium in the Punjab.

Chairman.—It is the monsoon that increases or decreases the area.

Hon'ble Mr. D. J. Boyd.—The proportion of irrigated area has gone up considerably. It is 56 per cent. of the total crop.

Mr. Jenkins.—The only step we have taken in that direction is to discourage the sowing of late Sind wheat, because that always fetches a low price.

Chairman.—Well, reverting to the question in hand, that is to say, the current year's wheat, the problem is really, as we have now discussed it, limited to particular attention being paid to this problem by the Punjab and Sind. The United Provinces are only apprehensive lest the Punjab depressed prices in future hurt them. Otherwise there is no pressing present problem.

Mr. Kharegat.—No.

Mr. Banerjee.—I might as well urge on behalf of the Central Provinces that nothing should be done which would result in Central Provinces wheat being displaced in the local markets by Punjab wheat or Sind wheat.

Chairman.—I can appreciate that. It is very natural.

Hon'ble Mr. D. J. Boyd.—Sir, as regards one of the remedies which I suggested, an increase in the demand for wheat in India, of course the best way of arriving at that is to improve the general purchasing power of the people, and their general prosperity. That will go further to remove our ills than anything else. But actually one scheme was suggested to us, namely, to persuade the railways, to begin with, to have a through railway freight from the Punjab to Calcutta without any break at Saharanpur. I understand you begin afresh the calculation from Saharanpur on the East Indian Railway.

Mr. Calder.—Yes. At present there is a through rate. Normally we do start afresh but at present there is a lump sum rate of Re. 1-0-4.

Hon'ble Mr. D. J. Boyd.—If we always had the through rate, our freight to Calcutta would be reduced by seven annas a maund. Then a scheme was proposed to us of opening godowns in Calcutta for the sale of standardised wheat. It would be properly graded. It is a purely provincial scheme and we have not definitely made up our minds about it. It has not been seriously considered by the Government. That is merely a scheme that has been suggested to us for improving our prices. But it is a possibility. Of course, if you carefully standardise your wheat which would be done in Calcutta and not in the Punjab, after it had arrived, you might create a demand for that particular kind of wheat in Calcutta but it would help one particular province and it is not going to help all the wheat producing provinces.

Hon'ble Sir Frank Noyce.—As a result of the discussion, the problem seems to me to be entirely a Punjab problem.

Chairman.—Punjab-*cum*-Sind.

Hon'ble Sir Frank Noyce.—I do not think the Sind problem is so acute as the Punjab problem.

Chairman.—They have got very little consumption in Bombay and Calcutta to take off the enormous quantity they are producing.

Hon'ble Mr. D. J. Boyd.—The history of our own colonies shows that at the beginning of each colony, we export large quantities of wheat from the Punjab, but the population very quickly overtakes production and after a few years those colonies are not exporting. An American professor wrote a monograph on the subject and his figures clearly showed that Sind will have the same experience. It is a serious position in the Punjab. It looks to me as if we shall have to shut down several of our departments unless we can find another crop to take the place of wheat.

Hon'ble Sir Jogendra Singh.—You cannot take wheat as an isolated crop ; you have to take all the crops together. Otherwise the Punjab and Sind get isolated with wheat. There is no other remedy but to raise the general prosperity of the people. In a normal year we produce about 5½ millions of cereals of which 3 millions are wheat, and we find that

there is a total surplus of unconsumed cereals of about ¾ millions, or 36 per head of population. 36 per head of the population, that is what we have got to get absorbed. To this surplus we contribute about 600,000 tons which is equal to about 1.1 of a ton per annum. The conclusion is that there is a surplus in the normal year of 6 million tons of wheat and 75,000 tons of other cereals. But the interdependence of crops you cannot ignore. If the price of rice goes up the price of wheat also goes up and *vice versa*. The whole problem will have to be taken up as a whole.

Chairman.—It merely comes to this that as regards the first part of the problem whether in view of the stock anything can be done to raise the prices the first thing to point out is that the Punjab and United Provinces state definitely that the forecast is to be reduced by 10 per cent. And is there any reason why this information should be withheld from the public ?

Several Members.—No.

Dr. Meek referred to the tables and said : If you estimate 10 per cent. smaller crop than has already been forecasted the position is going to be rather favourable and that I think is the reason for the rise in the prices. If you look at Statement No. VII, and compare the last price given there with the present day price it will be seen that the price has increased by 20 per cent. in the last month in Lyallpur.

Hon'ble Mr. D. J. Boyd.—We began cutting on the 13th April, but it has not gone on very far. But the crop of one big farmer shows a deficit of 10 per cent. and at the same time we are having reports from districts that the late sown crop is producing less than anticipated—it looks as if we should deduct 10 per cent. from our estimate.

Dr. Meek.—United Provinces also said 10 per cent.

Mr. Jenkins.—I do not think that in Sind the difference would be as much as 10 per cent.

Chairman.—Then it would be 10 per cent. in the Punjab and United Provinces and perhaps 5 per cent. in the case of Sind.

Hon'ble Sir Frank Noyce.—It seems to me that we cannot withhold the facts from the public.

Chairman.—The last point was about studying to what extent the agencies at the *mandis* should be organised. It is really necessary to study the effect of *satta* gambling on wheat prices. Personally I think last year the Punjab owed its high price to the *satta* gambling.

Hon'ble Mr. D. J. Boyd.—Not entirely due to that but it helped.

Chairman.—The unnatural phenomenon of larger crop and still higher prices was probably induced by the operation of these venturesome middlemen who indulge in this pastime. There is a gentleman in the United Provinces—I think Mr. Kharegat might know him—he says he had studied this problem very thoroughly and he wrote to Sir Harry Haig about it asking him to inform me about it. His name is Dr. L. M. Misra, M.A., Ph.D., who obtained his doctorate from the London University on the strength of a thesis on Indian Commodities Market Speculation. He hails from Shahjahanpur.

Mr. Kharegat.—I have heard of his name but I do not know him personally.

Chairman.—Perhaps you may see him and get into touch with him and get his thesis. He has sent an extract. There is a very short note intended only to be suggestive which our marketing expert has very kindly prepared for my private use. He had no time to study the problem or to develop his ideas, but still he thought he might make his suggestions on this point. I do not think he will object to the Punjab seeing that note, or perhaps having a talk with you if you find it necessary to do so.

I know that many people sell their wheat to dealers at a rate which may prevail on a particular date, in July, 1934, and so on. All these men who are purchasers are not really purchasers in the ordinary sense except perhaps those who buy for Jails and for the Army and things like that. Others are just dealers. There ought to be some way of getting friendly with them and so on. If consumption and output are the same, you can fix any reasonable price ; it may be Rs. 2, it may be Rs. 3 or it may go down.

Hon'ble Mr. D. J. Boyd.—The Punjab Government are making a beginning by putting on an officer prior to the appointment of a Marketing Officer to explore the ground for a foreign market. He will probably keep them informed, but in the meantime he is to gather facts regarding the present position for the Marketing Officer. He is certain to tell us a great deal which we do not know just now, and the way will be cleared. What we want to do is to obtain a higher price for the product than it is at present and I think that it is practicable. I know an enormous quantity of wheat from the Punjab has been sold forward at Rs. 1-14-0 per maund.

Chairman.—Well, I may say that the price may go down still further.

Hon'ble Mr. D. J. Boyd.—For the current year there does not seem to be much prospect.

Chairman.—Why not. It can go down any day. Is there anything else which you would like to say ?

Mr. Jenkins.—I do not think so.

Chairman.—You, Mr. Kharegat.

Mr. Kharegat.—I suppose an enquiry will be made as to what consumption figures really are. It would be worth while knowing that, if possible.

Chairman.—As I have pointed out, we do not deal with actual amount of wheat—whether production or consumption ; we deal with estimates. You have always estimates never being checked by any one. This is the condition of production. The question of consumption is based on higher mathematics rather than on realities. I think you have to concentrate yourself on India being a self-contained unit in the matter of wheat for some years to come and to so regulate your administration as to make it inflict least loss on the provinces, because as it is the prices do not come up to the cost of production. Other things are even worse. Next month we will be able to discuss oil seeds, rice, etc. There may be something in them. The idea at present is that we are telling the Punjab and Sind first to publish their revised estimates of output and secondly their taking interest in the *mandis* and seeing that everything is above board and that as a matter of fact the prices are reasonable prices as far as possible on the basis of production.

Mr. Jenkins.—We have got no *mandi* system in Sind.

Chairman.—That is so, I know.

Hon'ble Sir Jogendra Singh.—We should have uniformity of rates and measures.

Chairman.—An excellent idea. It is bound to come up in the Crop Planning Conference.

Hon'ble Mr. D. J. Boyd.—What about suggestions for a limitation of the wheat area in Sind ?

Chairman.—So far as Sind is concerned. if we take up that question, it will have to be taken up on the ground that the Government of India is keenly interested in the Sukker Barrage scheme bringing in as much return as possible, and if it is found by Government that by promoting the development of wheat they do not stand to gain as much as they would gain by substituting something else in its place, they will soon abandon wheat. We do not want Government to start taking action on charitable basis.

Hon'ble Mr. D. J. Boyd.—It has been done so in other countries. It is a question of extension of area.

Chairman.—Quite. What we have been discussing before this Conference was whether it is not possible in the Punjab to substitute something for wheat either in irrigated areas, part of them being reduced by 10 per cent. or in the un-irrigated areas. That of course is a thing which ought to be taken up. As you say, the Punjab prices are lower than those of any other province and since you have not yet decided, in the near future anyhow, whether it is not wiser to look ahead and substitute something else in the canal irrigated areas and, if possible, in the barani areas for wheat, you will perhaps, undertake such an examination.

Mr. Jenkins.—We are doing the same in Sind. I am sure the Bombay Government would not consider any proposal to restrict the area under wheat in Sind.

Sir T. Vijayaraghavacharya.—But Sind is the only Province in India where it is possible for Government to do something in the matter of control of crops. Here Government have a million acres of land for disposal. If uncontrolled cultivation of wheat is allowed in Sind a large quantity of surplus wheat will be thrown on the market which is bound to depress the Punjab prices.

Chairman.—Supposing the increased output of wheat continued to depress prices and the prices went down to one rupee, Sind will have to take stock of the position and take suitable action. As to the Punjab, it will have to consider whether 5 per cent. of the irrigated area under wheat should move on to oil seeds, but that again is a matter which cannot be even considered till the whole problem is before you, not only with reference to your own province, but with reference to the whole of India.

Sir T. Vijayaraghavacharya.—Burma is contemplating all kinds of licenses and restrictions about groundnut.

Chairman.—We conclude now.

Hon'ble Mr. D. J. Boyd.—We have to express our cordial thanks to the Chairman for convening this Conference which has at least served to clear our ideas.

WHEAT CONFERENCE, 1934.

The following statistics and graphs have been compiled by the Statistical Section, Imperial Council of Agricultural Research :—

Statement I.—Estimates of area and yield of wheat in India from 1924-25 up-to-date :—

(1) for British India, (2) for Indian States and (3) total for India.

Statement II.—Areas under wheat (*a*) Irrigated and (*b*) Unirrigated in British India from 1924-25 up-to-date.

Statement III.—Estimated production, exports and imports of wheat in India (including Indian States) for the years 1924-25 to 1933-34.

Statement IV.—Areas under principal crops in the main wheat-growing provinces in British India (with percentages for crops to total area).

Statement V.—Harvest time prices of wheat in selected centres in Punjab, United Provinces, Bihar and Orissa, Central Provinces and Bombay from 1929 up-to-date (compared with average of five years ending 1928).

Statement VI.—Harvest prices per maund of certain important crops in the main wheat growing provinces from 1925-26 up-to-date.

Statement VII.—Wholesale prices of wheat (the maximum prices in the first week of April, July, October and January) at Lyallpur, Karachi, and Bombay for years 1913-14 and from 1926-27 up-to-date.

Statement VIII.—Statistics of Internal Movement of wheat for years 1920-21, and April—September 1933 (with some figures for 1931 to 1933).

Statement IX.—Calculation of stocks of wheat in India (by Statistician, Imperial Council of Agricultural Research with a note by him).

Graphs.

Graph I.—Area of wheat in India from 1924-25 up-to-date (for British India, Indian States and whole of India).

Graph II.—Estimated yield (similar to graph I).

Graph III.—Average yield per acre for wheat in British India.

Graph IV.—Acreages under irrigated and unirrigated wheat in several provinces in India.

Graph V.—Harvest prices of important crops in the wheat-growing provinces from 1925-26 up-to-date.

Graph VI.—Balance of wheat available for consumption in India (from 1920-21 up-to-date).

STATEMENT I.

Estimates of Area and Yield of Wheat in India.

Crop year 1st July to 30th June.	Area (in million acres).			Yield (in million tons).		
	British India.	Indian States.	Total.	British India.	Indian States.	Total.
1924-25	24·7	7·1	31·8	7·2	1·7	8·9
1925-26	23·8	6·7	30·5	7·1	1·6	8·7
1926-27	24·0	7·3	31·3	7·4	1·6	9·0
1927-28	24·4	7·8	32·2	6·3	1·5	7·8
1928-29	24·8	7·2	32·0	7·3	1·3	8·6
1929-30	24·6	7·0	31·6	8·9	1·5	10·5
1930-31	24·6	7·6	32·2	7·6	1·7	9·3
1931-32	25·1	8·7	33·8	7·2	1·8	9·0
1932-33	24·8	8·2	33·0	7·6	1·9	9·5
*1933-34 .. .. (Third forecast April 1934).	26·4	8·5	34·9	8·0	1·9	9·9

*The final estimates will be available in August, 1934.

NOTE 1.—Wheat in India is normally sown between October and December, and harvested between March and May.

NOTE 2.—The figures in this statement are taken from "Estimates of Area and Yield of Principal Crops in India."

STATEMENT II.

Areas under wheat (a) irrigated and (b) unirrigated in British India.

(In million acres.)

Crop year (1st July to 30th June).	Punjab.			United Provinces.			Central Provinces and Berar.			*Bombay excluding Sind.			Sind.			Bihar and Orissa.			Others.			Total British India.		
	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.
										Total for Bombay (including B. A.			Sindh)											
1924-25 ..	4·7	5·0	9·7	2·9	4·5	7·4	·04	3·26	3·30	1924 ·25		·35	1·61	1·96	}	·26	·92	1·18	·56	·62	1·18	8·8	15·9	24·7
1925-26 ..	5·1	4·4	9·5	3·5	3·4	6·9	·03	3·47	3·50	1925 ·26		·35	1·15	1·50	}	·25	·91	1·16	·47	·77	1·24	9·7	14·1	23·8
1926-27 ..	5·0	4·4	9·4	3·8	2·9	6·7	·05	3·65	3·70	·15	1·10	1·25	·20	·23	·43	·27	·92	1·19	·43	·90	1·33	9·9	14·1	24·0
1927-28 ..	5·1	3·9	9·0	1·8	5·7	7·5	·02	3·68	3·70	·21	1·22	1·43	·16	·20	·36	·20	1·00	1·20	·51	·70	1·21	8·0	16·4	24·4
1928-29 ..	5·3	4·7	10·0	3·8	3·3	7·1	·02	3·18	3·20	·24	1·38	1·62	·20	·17	·37	·26	·95	1·21	·48	·82	1·30	10·3	14·5	24·8
1929-30 ..	5·6	4·3	9·9	3·8	3·4	7·2	·04	2·96	3·00	·16	1·13	1·29	·30	·34	·64	·26	·94	1·20	·44	·93	1·37	10·6	14·0	24·6
1930-31 ..	5·3	4·0	9·3	3·6	4·0	7·6	·04	3·06	3·10	·19	1·51	1·70	·25	·30	·55	·26	·95	1·21	·46	·68	1·14	10·1	14·5	24·6
1931-32 ..	4·9	4·2	9·1	3·8	3·9	7·7	·05	3·45	3·50	·26	1·66	1·92	·25	·20	·45	·25	·97	1·22	·49	·73	1·22	10·0	15·1	25·1
1932-33† ..	5·0	3·6	8·6	3·7	4·0	7·7	·06	3·44	3·50	·20	1·45	1·65	·61	·26	·87	·25	·99	1·24	·58	·66	1·24	10·4	14·4	24·8
1933-34‡ (Third forecast, April 1934).	5·1	4·4	9·5	3·7	4·4	8·1	·05	3·45	3·50	·22	1·66	1·88	·83	·24	1·07	·25	·97	1·22	Not available.		1·17	Not available		26·4

*As separate figures for Sind are not available in 'Agricultural Statistics,' figures have been taken from Provincial final forecasts.

†These figures are 'provisional.'

‡Final figures will be available in August 1934.

NOTE.—The figures in this statement for the years 1924-25 to 1931-32 are taken from Agricultural Statistics, Volume I.

STATEMENT III.

Estimated Production, Exports and Imports of Wheat in India (including Indian States) for the years 1924-25 to 1933-34.

	Crops years (1st July to 30th June).									
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
*Estimated production of Wheat in India (in tons).	8,866,000	8,696,000	8,973,000	7,791,000	8,592,000	10,469,000	9,306,000	9,024,000	9,452,000	9,899,000 (Third forecast April 1934).

	Fiscal years (1st April to 31st March).								
	1925-26.	1926-27.	1927-28.	1928-29.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
†Exports—									
Wheat	211,637	175,949	299,733	114,707	12,971	196,505	20,215	2,194	2,060
Wheat Flour	67,162	58,940	60,424	54,183	50,665	46,909	42,724	20,790	12,536
†Imports—									
Wheat	35,420	40,476	69,208	561,918	357,036	232,034	111,269	33,482	18,298
Wheat Flour	147	52	144	135	122	120	34	61	81
Re-Exports	..	..	..	32	4,320	..	2,205	..	..
Net Exports— or Net Imports + (taking 1 ton flour = 1½ tons wheat) (in tons).	—276,740	—223,805	—320,940	+366,139	+268,258	—34,654	+24,814	+194	—2,445
Apparent balance of 'wheat' available for consumption (*i.e.*, production + imports — exports).	8,589,000	8,472,000	8,652,000	8,157,000	8,860,000	10,434,000	9,331,000	9,024,000	9,449,600

* Taken from "Estimates of area and yield of principal crops in India."

† Taken from Sea-borne Trade Returns.

STATEMENT IV.

Areas under principal crops in the main wheat-growing provinces in British India (in million acres).

	1928-29.	1929-30.	Crop years (July 1st—June 30th). 1930-31.	1931-32.	1932-33.	Average for five years ending 1932-33.	1933-34 (latest forecast).	Percentage of crop to total acreage on the basis of average for 5 years ending 1932-33.
Punjab.								
1. Wheat	10·0	9·9	9·3	9·1	8·6	9·4	9·5 (April 1934) ..	30
2. Gram	4·2	3·2	4·1	5·5	3·9	4·2	..	14
3. Fodder crops	4·5	4·5	4·4	4·5	4·6	4·5	..	14
4. Bajra	2·5	3·4	3·2	3·2	3·4	3·1	..	10
5. Rape and mustard	1·7	1·1	0·9	1·1	1·2	1·2	1·1 (March 1934) ..	4
6. Jowar	0·9	1·1	0·9	1·1	1·1	1·0	..	3
7. Maize	1·0	1·1	1·1	1·0	1·0	1·0	..	3
8. Cotton	2·5	2·2	2·2	2·2	1·9	2·2	2·5 (May 1934) ..	7
9. Others	4·7	4·5	4·2	5·3	4·4	4·5	..	14
Total area sown	32·0	31·0	30·3	32·0	30·1	31·1		

	1928-29.	1929-30.	Crop years (July 1st—June 30th). 1930-31.	1931-32.	1932-33.	Average for five years ending 1932-33.	1933-34 (latest forecast).	Percentage of crop to total acreage on the basis of average for 5 years ending 1932-33.
United Provinces.								
1. Wheat	7·1	7·2	7·6	7·7	7·7	7·5	8·1 (April 1934) ..	17
2. Rice	7·1	6·8	6·8	6·7	6·3	6·7	5·9 (March 1934) ..	15
3. Gram	5·4	4·2	5·1	5·7	5·4	5·2	..	12
4. Barley	4·4	4·3	4·3	4·1	3·9	4·2	..	10
5. Jowar	2·3	2·5	2·5	2·6	2·4	2·5	..	6
6. Bajra	2·0	2·1	2·0	2·2	2·2	2·1	..	5
7. Maize	2·0	2·3	2·4	2·1	2·1	2·2	..	5
8. Sugarcane	1·3	1·3	1·5	1·6	1·8	1·5	1·7 (February 1934)	3
9. Fodder crops	1·2	1·2	1·2	1·3	1·4	1·2	..	3
10. Others	10·3	10·4	10·4	9·8	9·8	10·1	..	23
Total area sown	43·1	42·3	43·8	43·8	43·0	42·3		
Central Provinces and Berar.								
1. Rice	5·4	5·5	5·5	5·5	5·6	5·5	5·5 (March 1934) ..	20

2. Cotton	5·1	5·2	4·8	4·6	4·0	4·7	4·2 (May 1934) ..	17
3. Jowar	4·2	4·3	4·7	4·3	4·3	4·4	..	16
4. Wheat	3·2	3·0	3·1	3·5	3·5	3·3	3·4 (April 1934) ..	12
5. Gram	1·3	1·2	1·3	1·3	1·4	1·3	..	5
6. Others	8·3	8·1	8·3	8·7	8·4	8·4	..	30
Total area sown	27·5	27·3	27·7	27·9	27·2	27·6		
Bihar and Orissa.								
1. Rice	14·4	14·2	13·9	14·1	13·1	14·0	13·2 (March 1934)..	47
2. Maize	1·6	1·7	1·6	1·7	1·8	1·7	..	6
3. Barley	1·3	1·4	1·4	1·4	1·5	1·4	..	5
4. Gram	1·3	1·5	1·5	1·5	1·5	1·5	..	5
5. Wheat	1·2	1·2	1·2	1·2	1·2	1·2	1·2 (April 1934) ..	4
6. Others	10·2	10·4	10·2	10·2	10·2	10·2	..	33
Total area sown	30·0	30·4	29·8	30·1	29·3	30·0		
Bombay (including Sind).								
(Figures shown in brackets refer to Sind alone).								
1. Jowar	7·8	9·4	9·2	7·9	8·2	8·5	..	25
2. Bajra	5·0	4·4	5·1	5·2	5·1	4·9	..	14

	1928-29.	1929-30.	Crop years (July 1st—June 30th). 1930-31.	1931-32.	1932-33.	Average for five years ending 1932-33.	1933-34 (latest forecast).	Percentage of crop to total acreage on the basis of average for 5 years ending 1932-33.
Bombay (including Sind)—contd.								
3. Cotton	5·2 (·36)	4·8 (·30)	3·8 (·28)	4·3 (·25)	4·2 (·33)	4·5	4·1 (·49) ..	13
4. Rice	3·1	3·2	3·3	3·2	3·1	3·2	3·2 ..	9
5. Wheat	2·1 (·37)	2·1 (·64)	2·3 (·55)	2·3 (·45)	2·3 (·87)	2·3 (·58)	3·0 (1·07) ..	7
6. Fodder crops	2·1	2·4	2·3	2·4	2·6	2·4		7
7. Others	8·1	7·9	8·0	8·4	8·6	8·2		24
Total area sown ..	33·4	34·2	34·0	33·7	34·4	34·0		

STATEMENT V.

Harvest time wheat prices in India.

(Price per maund of 82 ⅔ lbs.)

Province and District.	Average of five years ending 1928.	Average for years.					1934 (April) prices new crop.
		1929.	1930.	1931.	1932.	1933.	
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Punjab.							
Lyallpur	3 12 0	4 0 0	3 0 0	1 7 0	1 13 0	2 14 0	1 13 6 to 1 15 0
Jullundur	3 15 0	4 2 0	3 1 0	1 10 0	1 14 0	2 12 0	1 14 0
United Provinces.							
Meerut	4 13 0	5 0 0	3 13 0	2 0 0	2 6 0	3 4 0	2 6 0
Shahjahanpur ..	4 14 0	4 12 0	3 6 0	1 13 0	2 6 0	2 12 0	2 13 0
Central Provinces.							
Jubbulpore	5 2 0	5 8 0	3 10 0	2 3 0	2 5 0	2 12 0	2 8 0
Nagpur	5 6 0	5 11 0	4 8 0	2 11 0	2 13 0	3 4 0	2 13 0
Bihar and Orissa.							
Patna	5 15 0	6 3 0	5 2 0	3 9 0	3 9 0	3 8 0	2 13 9
Muzaffarpur ..	5 8 0	5 14 0	4 12 0	3 6 0	3 4 0	4 3 0	3 1 3
Bombay.							
Dharwar	6 0 0	6 4 0	4 11 0	4 7 0	4 7 0	3 15 8	3 12 1
Nasik	6 4 0	6 8 0	6 1 0	4 5 0	4 6 0	3 5 1	3 2 4
Sind.							
Sukkur	5 8 0	5 14 0	4 7 0	2 10 0	2 11 0	2 5 0 to 2 6 0	1 14 0 to 1 15 0

NOTE.—The figures in this statement are taken from provincial season and crop reports except those for 1934, which were obtained specially from provincial Directors of Agriculture.

STATEMENT VI.

Harvest prices per maund (82⅔ lbs.) of certain important crops in the main wheat-growing provinces.

Province.	Crop years (1st July to 30th June).	Wheat.	Rice.	Barley.	Jowar or Cholum.	Bajra or Cumbu.	Maize.	Gram.	Cotton.	Rape and Mustard.	Linseed.
		Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A.	Rs. A. (Unginned American).	Rs. A.	Rs. A.
Punjab	1925-26	4 14	..	3 8	4 5	5 1	4 9	4 1	..	8 0	..
	1926-27	4 8	..	3 3	3 10	3 13	3 10	3 12	..	7 14	..
	1927-28	4 4	..	3 3	3 3	3 14	3 7	3 13	..	7 5	..
	1928-29	4 4	..	3 5	4 5	5 1	4 9	4 11	13 2	6 14	..
	1929-30	3 0	..	2 3	4 0	4 0	3 7	3 10	8 15	5 15	..
	1930-31	1 9	..	1 5	1 13	1 12	1 6	1 14	5 9	3 12	..
	1931-32	2 1	..	1 7	1 10	1 10	1 8	1 13	6 10	..	..
	1932-33	2 11	..	2 0	2 1	2 5	2 7	2 4	6 14	3 8	..
	1933-34	1 14	..	1 4	2 8	1 10	1 13	2 0	5 0	3 8	..
North-West Frontier Province.	1931-32	2 12	..	..	..	..	..	..	..	3 8	..
	1932-33	3 0	..	..	..	..	..	..	..	..	..
	1933-34	2 4	..	..	..	..	..	..	..	..	..
United Provinces ..	1925-26	5 8	7 4	3 12	4 14	5 5	4 0	3 13	..	..	..
	1926-27	5 3	7 4	3 13	3 13	4 0	3 13	4 1	..	..	..
	1927-28	5 2	7 2	3 5	3 1	3 10	3 3	4 4	..	..	..
	1928-29	5 5	7 6	4 2	5 5	6 3	4 9	5 5	..	..	..
	1929-30	3 14	7 0	2 13	3 14	4 7	3 14	3 14	..	..	..
	1930-31	2 5	5 2	1 8	1 10	1 13	1 13	2 3	..	..	..
	1931-32	2 9	4 2	1 12	1 10	1 13	1 9	1 14	..	..	..
	1932-33	2 15	3 14	1 10	1 11	1 15	1 14	1 15	..	..	..
	1933-34	2 9	3 10	1 10	1 10	2 0	2 0	2 4	..	..	..
Central Provinces and Berar.	1925-26	4 14	5 9	..	3 15	..	..	3 14	..	..	..
	1926-27	5 10	6 6	..	4 3	..	..	4 9	..	..	..
	1927-28	5 3	5 14	..	3 4	..	..	4 5	..	..	..
	1928-29	5 7	6 6	..	4 4	..	..	5 2	..	..	..
	1929-30	4 7	5 9	..	3 7	..	..	4 3	..	..	..
	1930-31	2 4	3 7	..	1 10	..	..	2 4	..	..	..
	1931-32	2 12	3 4	..	2 0	..	..	2 4	..	..	..
	1932-33	2 6	2 14	..	2 1	..	..	2 8	..	..	..
	1933-34	2 7	2 14	..	1 10	..	..	1 10	..	..	..
Bombay and Sind—											
	1925-26	7 11	..	..	4 14	5 7	..	5 13	Not available.	..	..
Bombay (including Sind).	1926-27	7 13	..	..	5 0	5 6	..	5 15	..	..	..
	1927-28	6 0	..	..	4 9	4 11	..	5 1	..	..	..
	1928-29	7 3	..	..	4 7	5 2	..	6 10	..	..	..
Sind	1929-30	4 8	..	..	4 7	5 10	..	6 5	7 10	..	..
	1930-31	2 8	..	..	2 8	3 6	..	4 2	5 10	..	..
	1931-32	2 11	..	..	2 0	1 15	..	3 0	6 12	..	..
	1932-33	2 6	..	..	2 1	2 0	..	2 15	7 2	..	..
	1933-34	1 14	..	..	2 2	2 1	..	2 12	6 0	..	..
Bihar and Orissa ..	1925-26	6 6	5 10	3 13	..	..	3 13	4 7	..	..	7 12
	1926-27	6 5	6 4	4 0	..	..	4 2	5 0	..	..	6 14
	1927-28	6 0	6 2	4 0	..	..	3 15	4 15	..	..	6 12
	1928-29	6 0	6 4	4 7	..	..	4 8	5 8	..	..	6 11
	1929-30	5 0	5 0	3 8	..	..	3 8	5 0	..	..	6 11
	1930-31	3 9	3 8	2 4	..	..	2 4	3 0	..	..	4 0
	1931-32	3 9	2 11	2 4	..	..	2 0	2 8	..	..	3 8
	1932-33	3 8	3 1	2 0	..	..	2 4	2 4	..	..	4 1
	1933-34	2 14	3 0	2 0	..	..	2 1	2 3	..	..	4 8

NOTE 1.—The figures in this table up to 1930-31 are taken from Agricultural Statistics, Vol. I and represent medium averages of the district figures reported in the Provincial season and crop reports. Figures after 1930-31 are taken from provincial season and crop reports and represent arithmetic averages.

NOTE 2.—'Blanks' for some provinces indicate that corresponding crops are not important for those provinces.

STATEMENT VII.

Wholesale prices of wheat in India.

(The maximum prices in the first week of each month or for the nearest period.)

[Prices per maund (82⅔ lbs.).]

Fiscal year.	Lyallpur (Punjab white).				Karachi (Punjab white).				Bombay (Delhi white).			
	April.	July.	October.	January.	April.	July.	October.	January.	April.	July.	October.	January.
	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.	Rs. A. P.
1913-14	3 7 0	3 3 0	3 0 0	3 6 0	3 15 0	3 12 6	3 10 9	3 11 6	5 7 0	5 4 0	5 9 6	5 6 0
1926-27	5 4 0	4 10 0	4 9 6	4 8 6	5 13 6	5 6 6	5 4 0	4 15 6	5 15 4	6 0 3	5 11 1	5 5 11
1927-28	4 12 0	4 8 9	4 5 0	4 10 6	5 3 0	5 3 9	4 15 3	5 0 0	5 7 6	5 12 8	5 5 0	5 5 0
1928-29	4 4 6	4 6 9	5 14 0	5 15 6	4 14 6	4 15 6	5 10 6	5 8 6	5 3 11	5 11 1	6 2 3	6 1 3
1929-30	6 5 6	4 1 6	4 8 0	4 5 6	5 0 0	4 11 9	4 15 3	4 14 0	5 13 3	5 4 2	5 8 7	5 3 0
1930-31	3 6 0	2 12 6	2 1 9	2 7 6	3 15 6	3 4 6	2 10 3	2 3 9	4 9 0	3 13 3	3 7 0	2 14 3
1931-32	1 14 0	1 9 0	1 10 6	2 9 0	2 5 6	1 15 0	2 0 9	3 1 9	2 13 4	2 5 10	3 7 0	2 14 3
1932-33	2 1 0	2 8 0	3 1 0	3 1 6	2 10 3	2 15 0	3 10 0	3 10 3	3 1 3	3 9 3	3 11 3	3 6 3
1933-34	3 6 6	2 13 6	2 2 6	2 2 0	3 9 3	3 3 3	2 9 0	2 9 9	3 3 9	3 10 2	2 9 1	2 11 3
1934-35	1 12 3	..	..	..	2 5 3	..	..	..	2 11 7	..	..	..

N.B.—The figures in this statement are taken from 'Indian Trade Journal'.

STATEMENT VIII (*a*).

Internal movement of wheat in India for years 1920-21 and April-September 1933.

(In tons).

Fiscal years.	From	Imported into														
		Bengal.	Bihar and Orissa.	United Provinces.	Punjab.	Sind and Baluchistan.	Central Provinces.	Bombay Presidency.	Rajputana.	Central India.	Nizam's Territory.	Calcutta.	Bombay Port.	Karachi.	Others.	Total to all places.
1920-21 ..	Bihar and Orissa	..	..	942	..	..	170	15	33	13	29	23,348	..	..	..	24,550
Do. ..	United Provinces.	..	13,203	..	..	613	5,131	11,144	3,291	1,082	4,779	86,770	29,786	30,297	13,419	199,509
Do. ..	Punjab ..	..	2,230	1,17,517	..	62,216	34,857	38,138	59,167	6,241	9,700	76,901	52,988	435,355	3,313	898,621
April to September 1933 (6 months).	Bihar and Orissa	1,089	..	1,421	..	..	..	..	..	..	..	3,184	..	..	273	5,967
Do. ..	United Provinces.	19,847	9,197	..	9,035	..	..	2,731	1,707	..	..	41,707	788	..	367	85,379
Do. ..	Punjab ..	1,590	494	11,324	..	1,037	..	2,680	16,951	..	..	995	523	35,552	291	71,437

STATEMENT VIII (*b*).

Movement of Wheat to Calcutta by Rail.

(In tons).

	Calendar years.			1934 (January to March—3 months).
	1931.	1932.	1933.	
From the Punjab..	17,845	8,172	10,757	14,560
From all areas includng Punjab	34,045	67,734	112,661	52,958

STATEMENT VIII (*c*).

Arrivals of Wheat in Karachi by Rail.

(In tons.)

Calendar years.	From above Samasata.	From below Samasata.	Total.
1932	212,924	163,720	376,644
1933	65,232	33,740	98,972
1934 (January to March)	21,021	17,093	38,114

STATEMENT VIII (*d*).

Coastwise Exports of Wheat from Karachi.

(In tons).

Calendar years.	To		Other ports in India.	Foreign Ports.	Total.
	Bombay.	Calcutta.			
1932	71,513	99,454	17,883	1,205	190,055
1933	163,720	36,105	11,885	640	214,700
1934 (January to March) ..	10,816	575	3,300	158	14,849

NOTES.

(1) Railborne trade returns were discontinued after 1920-21 and have been revised since 1st April 1933.

(2) Figures in tables (*b*), (*c*) and (*d*) have been kindly supplied by the Railway Board.

(3) Statement (*c*) above has been included to differentiate between wheat from the Punjab and wheat from Sind.

STATEMENT IX.

Calculation of stocks of wheat in India (by estimating progressive annual consumption) by Statistician, Imperial Council of Agricultural Research.

(Standford University method.)

Financial year. (April—March).	Balance of wheat available for consumption, *i.e.*, estimated production *plus* imports *minus* exports (See statement III).	Progressive annual consumption (See graph VI).	Stocks at the end of the year Excess (+) Deficit (—)	Progressive accumulated stocks (with 1920-21 as base).	Remarks.
	In million tons.	In million tons.			
1920-21 ..	9·793	8·375	+1·418	..	
1921-22 ..	7·971	8·464	—0·493	+·925	With a series of deficit years between years 1924-25 and 1928-29 the stocks at the end of 1923-24 vanish at the end of 1929-30; 1930 bumper harvest is responsible for the present stocks of 0·6 million tons.
1922-23 ..	9·558	8·553	+1·005	+1·930	
1923-24 ..	9·263	8·642	+0·621	+2·551	
1924-25 ..	8·436	8·731	—0·295	+2·256	
1925-26 ..	8·589	8·820	—0·231	+2·025	
1926-27 ..	8·472	8·909	—0·437	+1·588	
1927-28 ..	8·652	8·998	—0·346	+1·242	
1928-29 ..	8·157	9·087	—0·930	+0·312	
1929-30 ..	8·860	9·176	—0·316	—0·004	
1930-31 ..	10·434	9·265	+1·169	+1·165	
1931-32 ..	9·331	9·354	—0·023	+1·142	
1932-33 ..	9·024	9·443	—0·419	+0·723	
1933-34 ..	9·449	9·532	—0·083	+0·640	
1934-35 ..	9·899 (On the basis of third forecast of production).	Average 8·95 million tons.	..	..	

WHEAT CONFERENCE, 1934.

NOTE ON 'CALCULATION OF STOCKS OF WHEAT IN INDIA' (*VIDE* STATEMENT IX AND GRAPH VI)

BY

M. VAIDYANATHAN, *Statistician, Imperial Council of Agricultural Research.*

In India generally figures of stocks of agricultural commodities are not available (excepting for cotton where too the figures are considered to be inaccurate). The only method possible for arriving at an estimate is to calculate progressive annual consumption on the basis of balance of crop available for consumption each year (*i.e.*, estimated production *plus* imports *minus* exports). This has been worked out by fitting a linear curve to the data of 14 years (1920-21 to 1933-34) on the lines suggested in 'Wheat Studies' Standford University (U. S. A.). For wheat, taking 1920-21 fiscal year as the base (as 1920 crop was a bumper one), it is found that the annual consumption of wheat in India continuously increases from 8.375 million tons in 1920-21 to 9.532 tons in 1933-34, giving an average annual consumption of 8.95 million tons. This gives 14 per cent. increase in the consumption of wheat over a period of 14 years, and fits in with the increase in population as recorded by the Census (the increase in population in 1930-31 over that in 1920-21 being 10.6 per cent. and for wheat-growing provinces alone being 11.8 per cent.). Working on this basis of progressive annual consumption, it is found that of these fourteen years, only three years (1920-21, 1922-23 and 1930-31) were years of good surpluses, 1923-24 shows a small positive margin, and all other years were deficit years. From statement IX it might be seen that the deficits during the period 1924-25 to 1929-30 were met by the stocks held at the end of 1923-24. In the beginning of 1930-31 the stocks, according to this estimate were nil, and 1930 bumper crop (of more than 10 million tons) has been slowly washed out during the subsequent years 1931-32 to 1933-34 when yields were defective though only to a small extent. The stocks at the beginning of this financial year (*i.e.*, in April 1934) may therefore be estimated at .64 million tons. The third forecast of the crop just being harvested shows that there will be further accumulation at the end of this year (*i.e.*, in March 1935), bringing the old stocks *plus* the surplus out of the present harvest to about 1 million tons.

STATEMENT X.

Current approximate Railway Freight for wheat (per maund) as in May 1934.

(Figures within brackets represent distance in miles.)

From	To					
	Shahjahanpur.	Patna.	Calcutta.	Sukkur.	Karachi.	Bombay.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Lyallpur	0 12 9	1 0 0	1 0 4	0 7 10	0 11 8	0 14 3
	(548)	(1,086)	(1,256)	(299)	(685)	(1,002)
Shahjahanpur ..	..	0 6 10	0 9 7	..	..	..
		(358)	(718)			
Patna	..	..	0 6 5	..	..	..
			(332)			
Sukkur	0 15 1	1 3 6	1 5 10	..	0 7 10	..
	(815)	(1,237)	(1,517)	..	(299)	..
Karachi (Coastal Steamer).	..	..	0 5 9	..	..	0 4 11

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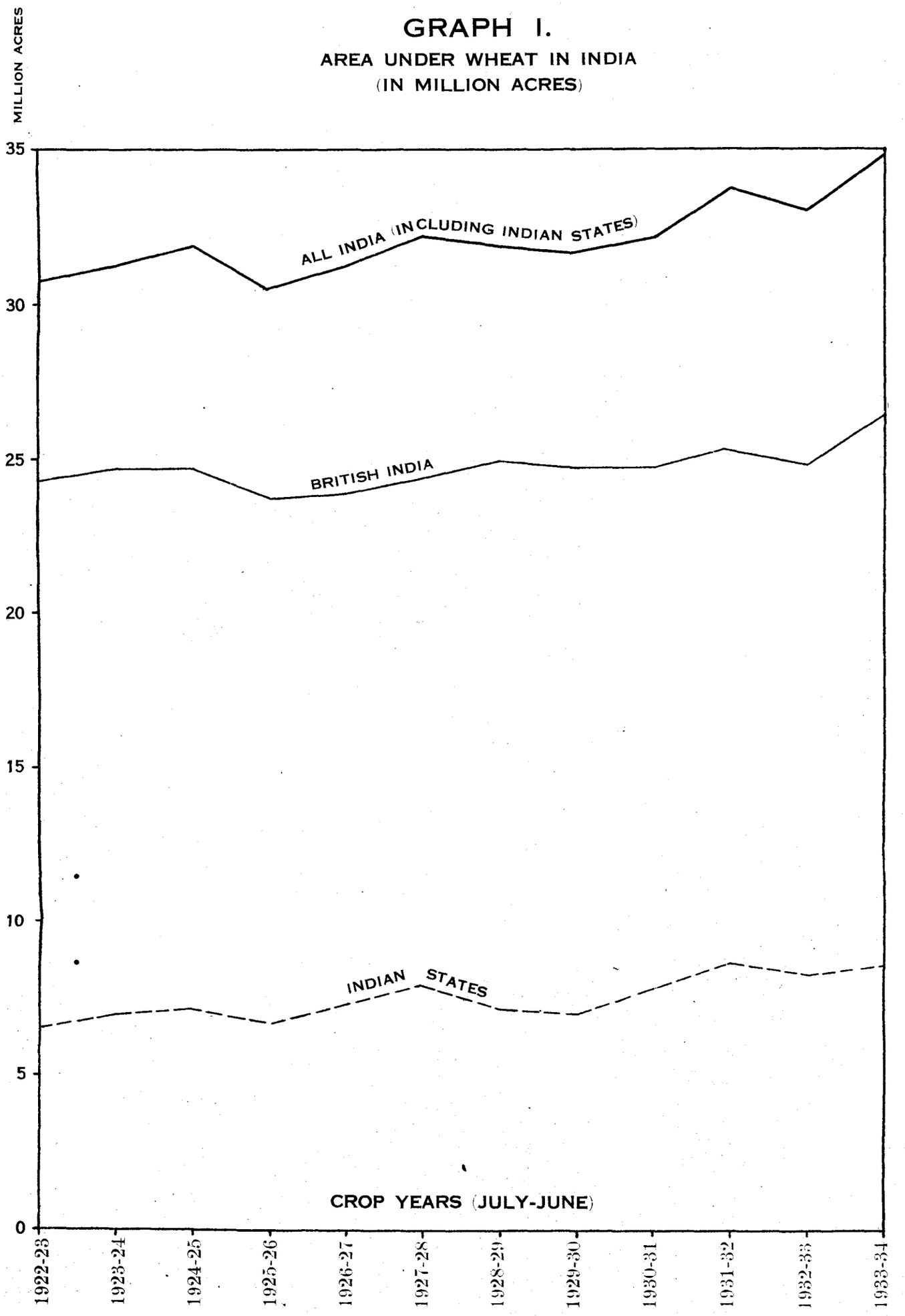
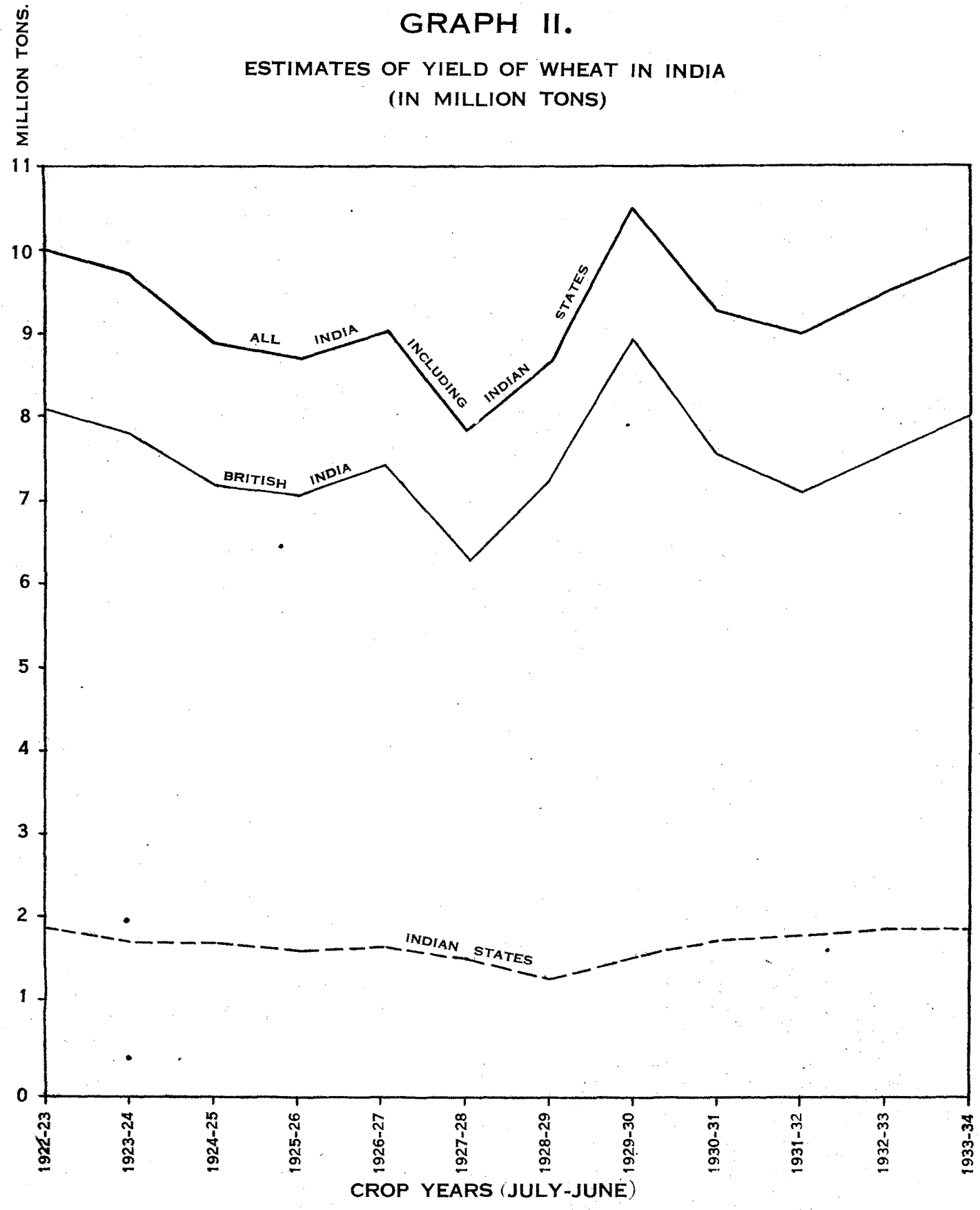
GRAPH I.

AREA UNDER WHEAT IN INDIA
(IN MILLION ACRES)



GRAPH II.

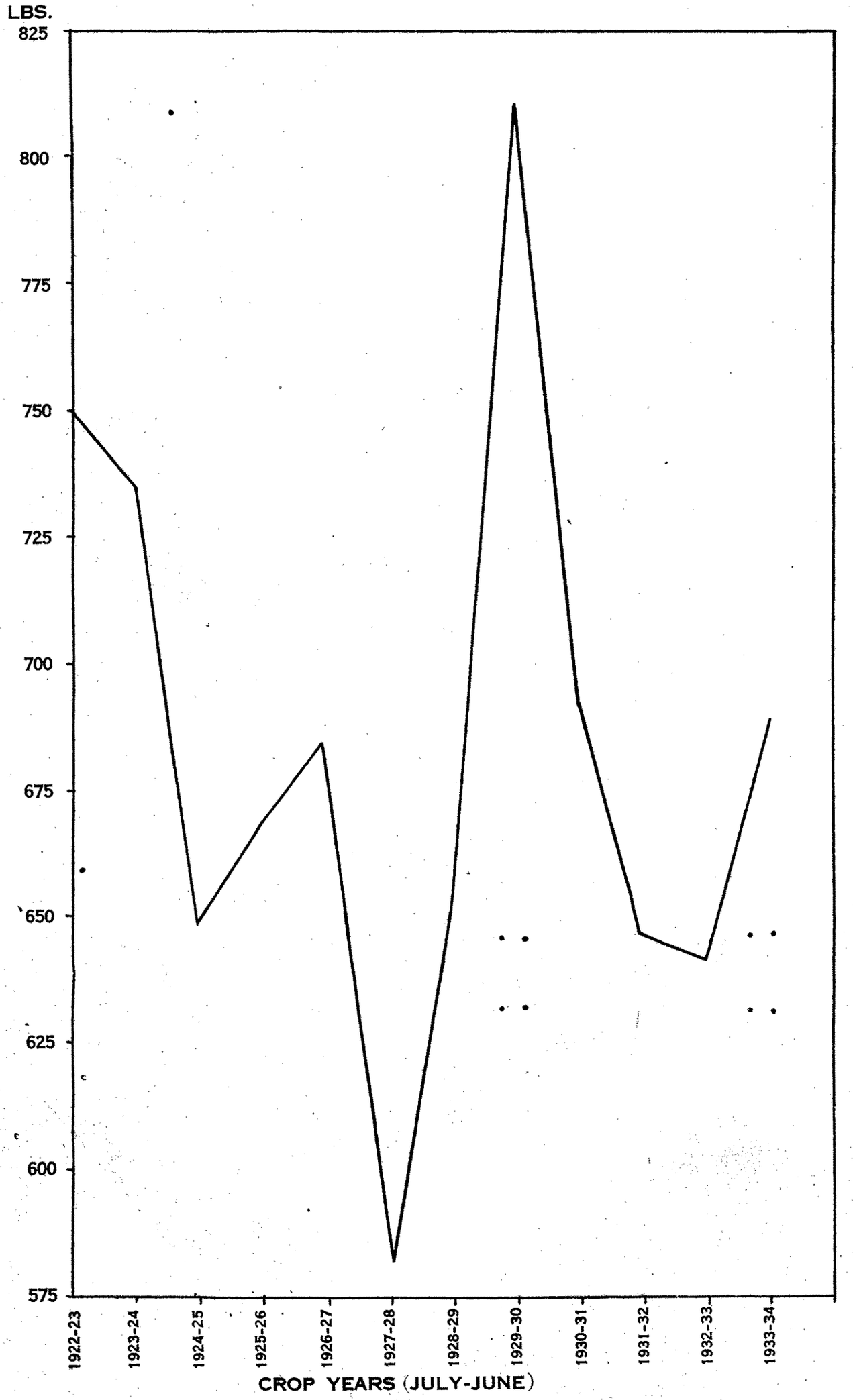
ESTIMATES OF YIELD OF WHEAT IN INDIA
(IN MILLION TONS)



GRAPH III.

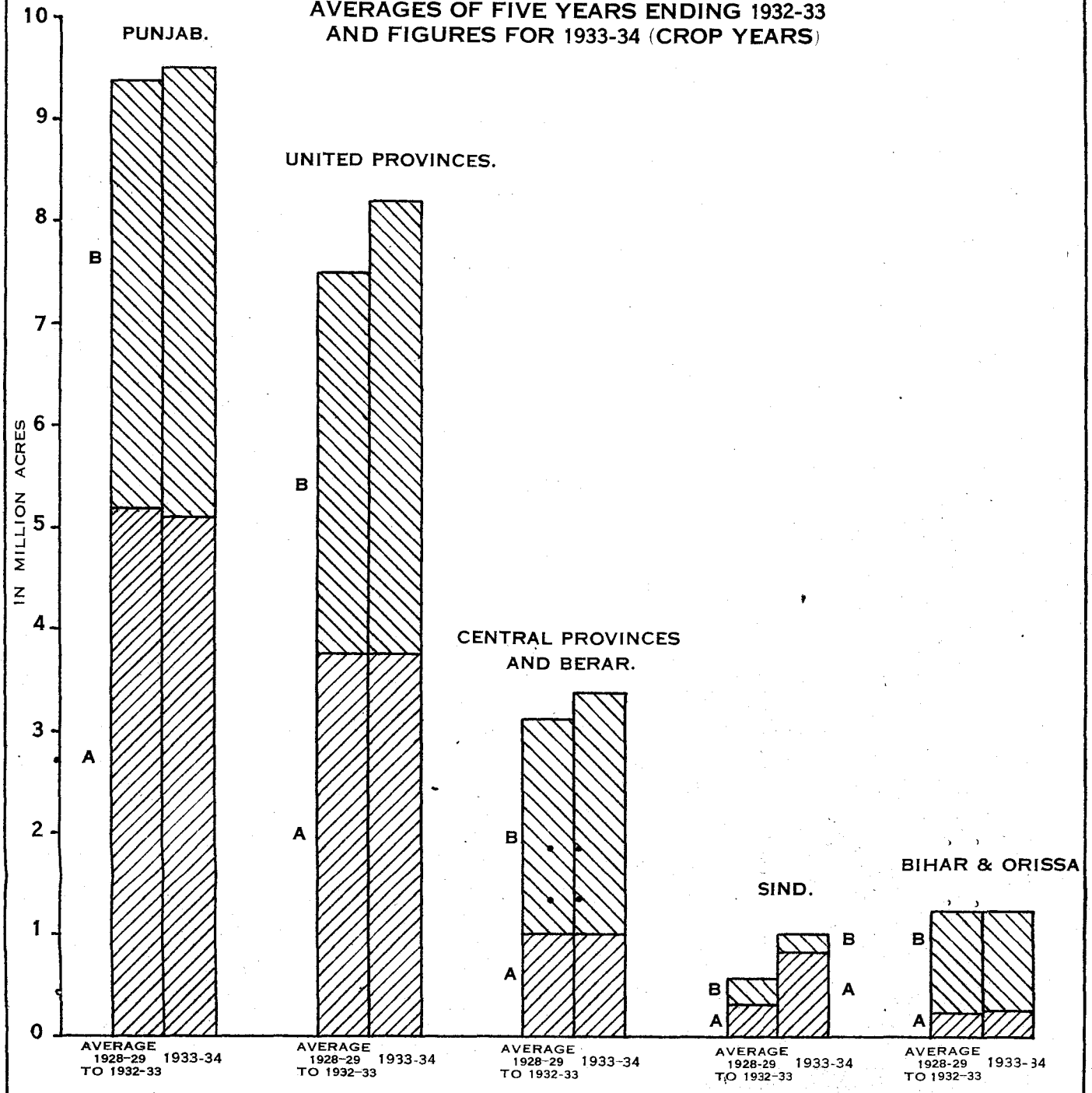
AVERAGE YIELD PER ACRE OF WHEAT IN BRITISH INDIA (IN LBS.)

$$\left(=\frac{\text{ESTIMATED YIELD}}{\text{TOTAL ACREAGE}}\right)$$



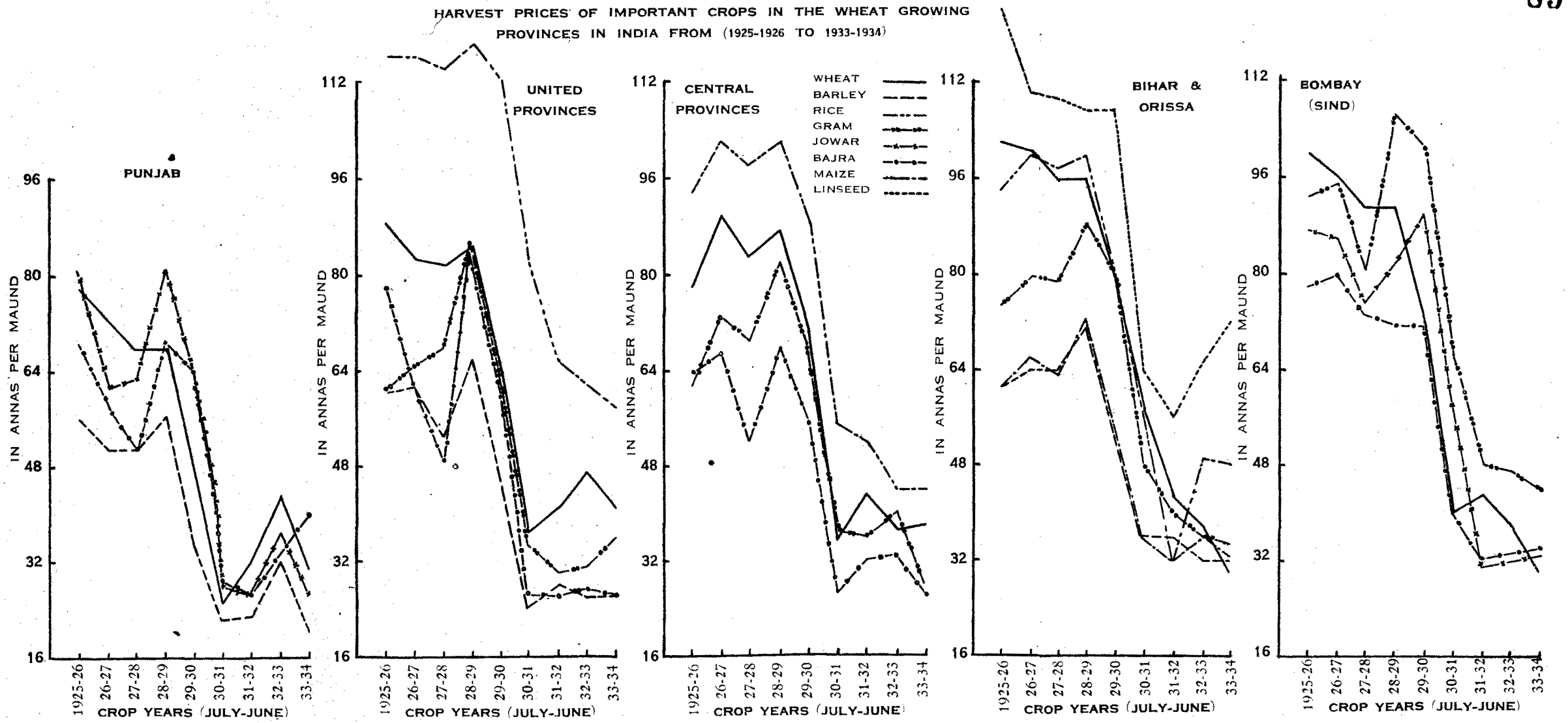
GRAPH IV.

ACREAGES UNDER WHEAT (A) IRRIGATED (B) UNIRRIGATED IN CHIEF WHEAT GROWING PROVINCES IN INDIA AVERAGES OF FIVE YEARS ENDING 1932-33 AND FIGURES FOR 1933-34 (CROP YEARS)



GRAPH V.

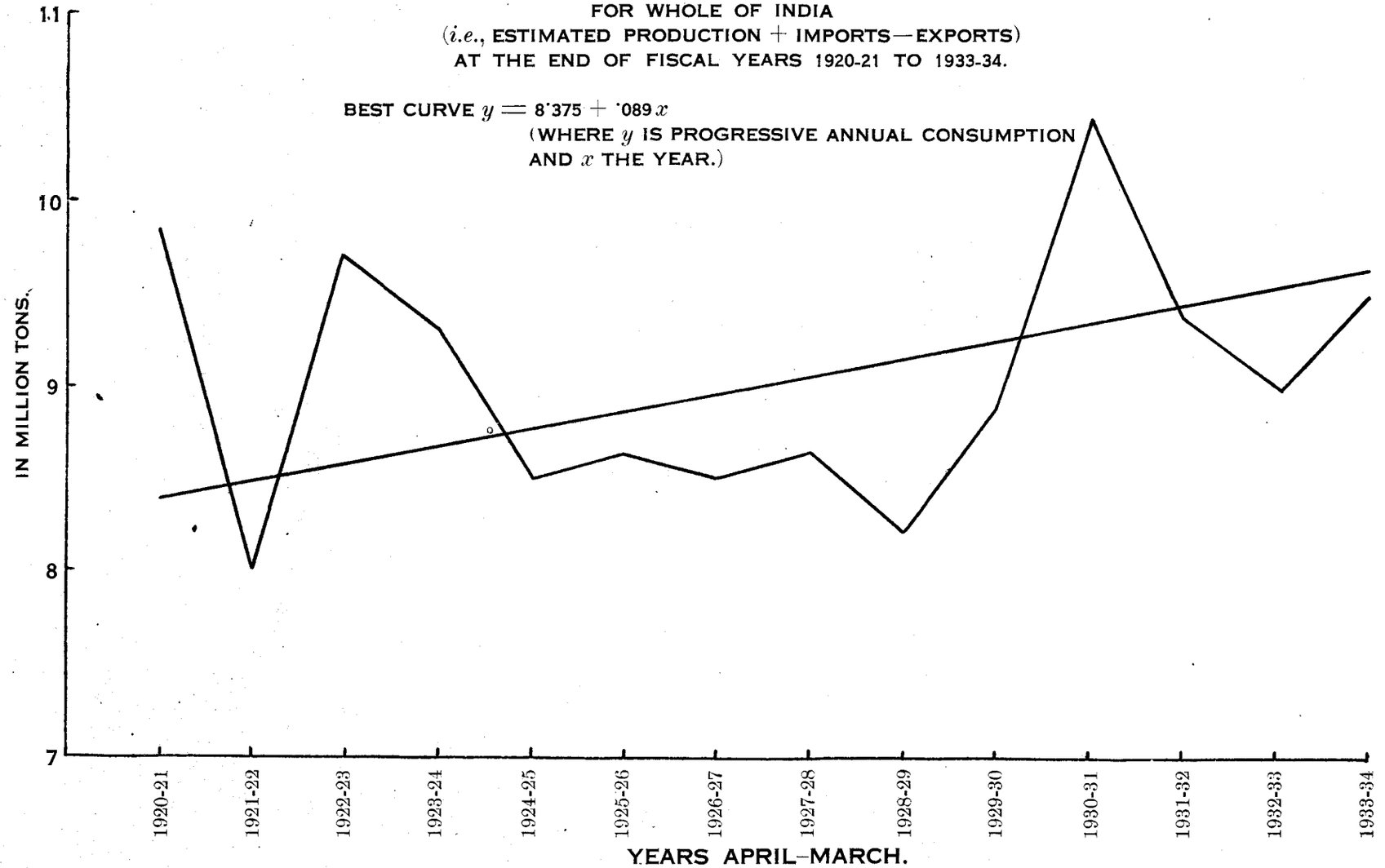
HARVEST PRICES OF IMPORTANT CROPS IN THE WHEAT GROWING PROVINCES IN INDIA FROM (1925-1926 TO 1933-1934)



GRAPH VI.

SHOWING BALANCE OF WHEAT AVAILABLE FOR CONSUMPTION
FOR WHOLE OF INDIA
(*i.e.*, ESTIMATED PRODUCTION + IMPORTS—EXPORTS)
AT THE END OF FISCAL YEARS 1920-21 TO 1933-34.

BEST CURVE $y = 8{\cdot}375 + {\cdot}089x$
(WHERE y IS PROGRESSIVE ANNUAL CONSUMPTION
AND x THE YEAR.)



Proceedings

of the

All-India Conference

for the

Preservation of Wild Life

(Held on the 28th, 29th and 30th January 1935)

NEW DELHI: PRINTED BY THE MANAGER
GOVERNMENT OF INDIA PRESS: 1936

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ALL-INDIA CONFERENCE FOR THE PRESERVATION OF WILD LIFE.

Agenda.

Item No. 1.—To review the present position of the fauna and flora of India and to consider generally their protection and in particular the protection of animals peculiar to India.

(*a*) In Forests.

(i) The desirability of definitely laying on the Forest Departments the duty of preserving fauna and flora in the areas in their charge.

(ii) The destruction of such wild animals, such as wild dogs, as tend to decrease other and more important game.

(*b*) Outside.

1. Inclusion of life histories of wild animals in school text-books.
2. Collection of statistics of important and rare wild life in India.
3. Ornithological societies for the protection and study of bird life and nature study.

Item No. 2.—Inoculation of village cattle against infectious diseases particularly in the vicinity of game preserves for the protection of wild life.

Item No. 3.—Special legislation for the preservation of wild life (outside the Indian Forest Act) enacted in various provinces. What further steps are necessary in this respect?

Item No. 4.—Measures to restrict the possession or use of weapons which may be used for poaching and the feasibility of amending the Arms Rules:—

1. (*a*) to limit the length of the barrels of guns used for the protection of crops, etc.

   (*b*) to limit the use of such arms to certain seasons.

2. to limit the number of cartridges in the case of licenses taken out for protection or display.

Item No. 5.—To consider the extent to which India can accede to the Convention drawn up by the International Conference for the Protection of the Fauna and Flora of Africa and the modifications necessary to make it suitable for India.

Item No. 6.—To consider whether the convening of an Asiatic Conference in London is desirable.

List of delegates to the All-India Conference for the Preservation of Wild Life held on 28th, 29th and 30th January, 1935.

Government of India	1. The Hon'ble Khan Bahadur Mian Sir Fazl-i-Husain, K.C.S.I., K.C.I.E., Kt., Member in charge of the Department of Education, Health and Lands.
	2. G. S. Bajpai, Esquire, C.I.E., C.B.E., I.C.S., Secretary, Department of Education, Health and Lands.
	3. M. S. A. Hydari, Esquire, C.I.E., I.C.S., Deputy Secretary, Department of Education, Health and Lands.
	4. C. G. Trevor, Esquire, C.I.E., I.F.S., Inspector General of Forests.
	5. Khan Sahib Allah Bakhsh, I.F.S., Personal Assistant to Inspector General of Forests.
	6. Colonel E. J. Ross, O.B.E., M.C., Adjutant General's Branch (Army Department).
	7. Dr. Baini Prashad, Director of the Zoological Survey of India.
	8. Colonel A. Olver, C.B., C.M.G., F.R.V.S., Animal Husbandry Expert, Imperial Council of Agricultural Research.
	9. C. M. Trivedi, Esquire, O.B.E., I.C.S., Home Department.
	10. Major C. G. Prior, Foreign and Political Department.
Madras . . .	11. Mr. A. Wimbush, I.F.S., Chief Conservator of Forests.
Bombay . .	12. Mr. S. H. Prater, Curator (Representative of the Bombay Natural History Society) (Junagad State).
Bengal . . .	13. Mr. E. O. Shebbeare, I.F.S., Conservator of Forests.
United Provinces .	14. Mr. F. Canning, C.I.E., I.F.S., Chief Conservator of Forests.
	(He represented the Tehri Garhwal State as well.)
	15. Mr. F. W. Champion, I.F.S.
	16. Major J. Corbett, Nainital. Joint Hony. Secy., Assn. for the Preservation of Game in the United Provinces.
	17. Kunwar Bam Bahadur Shah of Radice Road, Lucknow.
	18. Raja Muhammad Amir Ahmad Khan of Mahmudabad, Butler Palace, Lucknow.
	19. Mr. Hasan Abid Jafry, Bar.-at-Law, Butler Palace, Lucknow. Joint Hony. Secy., Assn. for the Preservation of Game in the United Provinces.

Punjab and N.-W. F. P.	20. Mr. A. M. David, I.F.S. (Game Warden).
	21. Mr. C. H. Donald, late Warden of Fisheries.
	22. Rai Sahib Lala Gopal Das, M.L.C., Punjab.
Bihar and Orissa .	23. Mr. J. W. Nicholson, I.F.S.
Central Provinces .	24. Mr. J. Whitehead, I.F.S., Chief Conservator of Forests.
Assam . . .	25. Mr. A. J. W. Milroy, I.F.S., Conservator of Forests.
	26. Mr. T. R. Phukan.
Delhi . . .	27. The Hon'ble Mr. J. N. G. Johnson, C.I.E., I.C.S., Chief Commissioner.
	28. Mr. A. Kirke Smith, V.D., Solicitor to the Government of India.
	29. Major R. C. Reynolds, M.C., R.A., Deputy Assistant Adjutant General (Representative of Delhi Association for Preservation of Wild Life).
Baluchistan . .	30. Mr. C. P. Skrine, I.C.S.
	Delegates from Indian States.
Hyderabad . .	31. Nawab Hamid Yar Jung Bahadur, Inspector General of Forests, Hyderabad.
Mysore . . .	32. Mr. M. Machaya, B.A., Conservator of Forests.,
Kashmir . . .	33. Sir Peter Clutterbuck, Kt., C.I.E., C.B.E. Chief Conservator of State Forests.
	(He represented Cutch Durbar and Society for Preservation of the Fauna of the British Empire also.)
	Idar Durbar.
	34. Mr. Robindranath Bhandari, B.A., LL.B. Secretary, Mahekmakhas.
Eastern States .	*Dhenkanal.*
	35. Mr. Srikaran Birbar Durga Charan Patnaik, State Conservator of Forests.
	Sonepur.
	36. Mr. Jiwan Singh, Deputy Secretary.
	Surguja.
	37. Mr. Babunandan Lal, Personal Assistant.
	Bastar.
	38. Mr. E. S. Hyde, I.C.S., Administrator.
	Mayurbhanj.
	39. Mr. F. B. Gagliardi, Forest Officer.
	Other States.
	40. Mr. F. A. A. Hart, I.F.S., Forest Adviser Eastern States.

Central India States.	*Datia.*	
	41. Qazi Aminuddin Ahmed.	
	Baoni.	
	42. Sahibzada Mahmood Ali Khan.	
	Orchha.	
	43. Major Sajjan Singh, Revenue Minister.	
	Panna.	
	44. Pandit Chuni Lal Sharma, M.A., LL.B., Political Minister.	
	Charkhari.	
	45. Pirzada Amir Hassan, State Advocate.	
	46. Syed Ali Abbas, Naib Dewan.	
	Indore.	
	47. Mr. N. R. Advani, B.Sc. (Edin.), F.R.F.S. (Scott.), Superintendent of Gardens.	
	Bhopal.	
	48. Mr. Akhtar Ali Khan, B.A., Conservator of Forests.	
	Rewa.	
	49. Mr. Devi Shankar Khandelwal, B.Sc., Divisional Forest Officer.	
Punjab States.	*Patiala.*	
	50. Mr. Karl Johannsen, Conservator of Forests (Hills).	
	Bahawalpur.	
	51. K. B. Nabi Bakhsh Mohd. Hussain, C.I.E., Prime Minister.	
	Sirmur.	
	52. Kanwar Ajit Singh, Superintendent of Police.	
	Keonthal.	
	53. The Raja of Keonthal.	
	Jubbal.	
	54. The Raja of Jubbal.	
Gujarat States	*Baroda.*	
	55. General N. G. Shinde.	
	Lunawada.	
	56. Mr. Maganlal L. Desai, B.A., LL.B., Dewan.	
	57. Mr. Mohanlal T. Jain, Private Secretary.	
Madras States	*Travancore.*	
	58. Mr. S. C. H. Robinson, State Game Warden.	
	Sandur.	
	59. Mr. G. B. Deshmukh.	
Benares	60. Mr. J. W. Bolam, I.P., Superintendent Police.	
Bengal States	*Tripura.*	
	61. Babu Jogesh Chandra Chaudhury.	

Proceedings of the All-India Conference for the Preservation of Wild Life.

(on 28th January 1935.)

The Honourable Khan Bahadur Mian Sir FAZL-I-HUSAIN: Gentlemen, I have been asked by His Excellency the Viceroy to extend a hearty welcome to you all. His Excellency's interest in the objects for which your Conference has been convened is deep. It is with very great regret indeed that he finds himself prevented by urgent and more important public business from welcoming you all personally. He wishes me to assure you that he will follow your proceedings with interest.

May I also warmly associate myself with His Excellency's welcome. You have come from different parts of India at much personal inconvenience: that is proof of your public spirit and enthusiasm for what in this country is still a nascent movement. May your deliberations be fruitful for the cause that you have at heart.

Gentlemen, the movement, which you represent, has been in existence for some time. A land which has been conspicuous in history for its humane traditions could not be indifferent to animal life. Sporting instincts, which true fondness for shikar stimulates, have the same effect. It is not surprising, therefore, that what is being done in other countries, *e.g.*, Africa should lead to a desire amongst you to take stock of the situation in India. From that point of view, the representative character of this Conference is a matter of great satisfaction. It affords a guarantee that the various questions that need attention will be comprehensively and carefully considered. We have, therefore, endeavoured to make the Agenda as wide as possible. For convenient reference, we have also tried to relate the papers received from the Provinces and States to the different items of the Agenda. If we have not succeeded in making each subject of discussion distinct and self-contained as regards its supporting material, it is because a certain amount of overlapping is inevitable.

Gentlemen, you are about to explore what is practically a new subject. There are not many local precedents to guide one. You will have, to use an appropriate metaphor, to blade your own path. This is a free Conference and we, in the Government of India, have no desire to fetter your discretion or impose on you any plan of our own. If I venture on a word or two of caution, it is merely to draw attention to certain limitations which might be lost sight of because of their very obviousness. The first consideration is that any practical proposals that you make must be such as public opinion generally would support. The right balance must be struck between the demands of wild life for protection and the requirements of the cultivator. A second consideration, no less important, is that responsibility for giving effect to such of your proposals as need Government aid must rest primarily with the Provinces, who are now and, in the near future, will be even more completely autonomous to regulate such matters.

Lastly, while I am on this subject, I would like to refer to a suggestion made to me some time ago by the President of the United Provinces Association for the Preservation of Game, that this Conference should be succeeded by, what he termed, a non-official Conference. He has been good enough at my request to withdraw this suggestion of his. I hope the Conference will agree that in this matter. there is really no division, between officials and non-officials as regards the objective. Opinions may differ as to the precise measures necessary for the preservation of wild life but those should be susceptible of adjustment. The important thing to realise is that if this movement is to succeed, officials and non-officials must whole-heartedly co-operate. Indeed the prime movers in educating public opinion must be the non-officials.

Let us, therefore, no matter whether we are officials or non-officials, representatives of Indian States or of Societies interested in the preservation of wild life, throw our experience into the common pool and endeavour to evolve a common policy. I do not propose to take up more of your time by making any observations on the various items of the Agenda. You are better fitted to deal with these matters than I am. When I receive your recommendations, it will be my business to secure for them sympathetic and expeditious consideration.

One word before I leave you. Owing to the demands of urgent business elsewhere, it will not be possible for me to preside throughout your deliberations. You will, therefore, want some one else to guide your deliberations during my absence. It is for you to decide whether you will choose one yourself or let me name some one for this important duty. I am entirely in your hands in this matter.

Sir PETER CLUTTERBUCK: I should like to propose that you name your deputy, Sir.

The Honourable Khan Bahadur Mian Sir FAZL-I-HUSAIN: I have thought over the matter and I think it is in the fitness of things that Mr. Trevor, who is our Inspector General of Forests, should preside over your deliberations. I will now request Mr. Trevor to be so good as to take the chair and assure him of the co-operation of you all and hope he will be able to take you through this lengthy agenda during the three days that have been set apart for this Conference.

(The Honourable Sir Fazl-i-Husain then vacated the chair which was taken by Mr. C. G. Trevor.)

Mr. CHAIRMAN: Gentlemen, verbatim reports of the speeches made here will be taken down in shorthand and after having been slightly edited by the Secretariat, they will be sent to the gentlemen concerned for correction in proof, and I am to ask you to correct any material which is sent to you in proof and to return it to the Secretariat within 15 days, so that the proceedings may not be delayed. If any gentleman does not happen to send his speech back within 15 days, then we shall conclude that no corrections are necessary.

Another thing which I want to mention is that there are one or two misprints in the printed papers belonging to the Government of Bihar and Orissa. They are not of any great consequence, but as they have been pointed out, I should like to inform you that they have been duly corrected in the official copies.

Now, we had better go on to item No. 1.—"To review the present position of the fauna and flora of India and to consider generally their protection and in particular the protection of animals peculiar to India". You will see from the printed papers under this item that certain animals have been mentioned by the Society for the Preservation of the Fauna of the Empire in their memorandum on the subject as requiring, or possibly requiring, special protection, and I think the best way of disposing of this matter is for me to ask gentlemen representing the parts of India where these animals live to give us their views regarding the present position of the animals in question and what special protection is being afforded to them or should be afforded to them. I think I am correct in saying that the following animals are in need of special protection in this country:—all species of Rhinoceros, the wild Ass of Sind, the Sind Ibex, the lion of Kathiawar, the musk deer, the bison, the wild buffalo and the Nilgiris Ibex, and I think it would be interesting for us to hear a statement by officers who have knowledge and experience of these animals as to how the position exactly stands.

Mr. E. O. SHEBBEARE: Mr. Chairman and Gentlemen, the rhinoceros has been protected throughout Bengal and Assam. Bengal has introduced an Act protecting it, and it is absolutely protected. The only possible exception is that for scientific purposes the rhinoceros might be allowed to be shot. As far as legislation goes, all species of rhinoceros are completely protected. We in Bengal have probably 50 animals. This species is getting very rare. We have got them in very restricted parts of the country. The other rhinoceros, that is, the small two-horned rhinoceros, I tried to find in Bengal, it is probably still in the Chittagong hill tracts. As far as other game is concerned, Bengal is very much worried about all species of grass jungle animals, that is to say, the buffalo, the rhino, of course, the swamp deer, and the bison, who is more a tree jungle animal. We have a fair stock of them. But they are regularly killed by attacks of rinderpest. As far as legislation goes, they are absolutely protected in Northern Bengal. In Southern Bengal, the bull bison may be shot at certain seasons. All swamp deer are absolutely protected by rules made by the Shooting Club in the district in which they live and they have recently been notified under the Wild Birds Act. The value of a rhinoceros horn is over a thousand rupees.

Mr. WIMBUSH: Gentlemen, of the animals mentioned by the Chairman, I think the Nilgiri Ibex and bison are the only animals with which Madras is particularly concerned. The Nilgiris Ibex is definitely on the increase and is on the whole adequately protected. It lives in places which are generally speaking free from motor roads. It is safe from anybody setting out from headquarters, as it is necessary to go into camp with a fairly difficult bundobust as a rule before one can hope to get a Nilgiri Ibex. In the case of the Annamalai Hills, where you have a planting district, this animal is adequately protected and on the increase. At the present time, the bison are comparatively safe, apart from the question of alienation of land and the destruction of the areas in which they live for purposes such as the increase of tea planting. But at the moment, there is no great demand for land for tea planting owing to slump, and, generally speaking, bison are comparatively safe. They are, however, as Mr. Shebbeare said, subject to rinderpest periodically. It is expected

to increase again. At the moment, it is on the drop, and I have not heard of cases of bison suffering from rinderpest in the last 2 or 3 years There is always the danger of its constantly recurring.

Sir PETER CLUTTERBUCK: The wild Asses of Cutch are actually in the Rann which is a salt desert 9,000 square miles in area and perfectly flat. It is covered with shallow water in the rains for about 3 or 4 months with water knee deep; and there is salt with it. It dries up for the rest of the year. By the end of January or the beginning of February, it looks like a snowfield. This is the place where the wild Asses live, and they are reported to be decreasing very much. The Rann entirely belongs to the Cutch State, but on its borders on the north, east and south-east are other States, so that the question of protection is a very difficult one indeed. There are no inhabitants in the Rann at all. Any one can go from any part of the exterior boundary of the Rann and shoot the Assess. The Maharao is very keen on doing anything he can to protect these animals but the trouble is that there is really no definite proposal in hand and without the combination of all these States round about the Rann, I do not see how any protection can be given.

The whole of Cutch is more or less preserved, as far as shooting is concerned. The land part of Cutch is 7,500 square miles. The shooting of Asses is done without anybody's knowledge. All that can be said that the general opinion is that the Asses are decreasing.

Two years ago, the Zoo wanted to get some wild Asses which they never have had and the Maharao arranged to have a pair of foals caught and sent Home.

Mr. CHAIRMAN: Is there any representative from Kathiawar to tell us about the lions of Kathiawar?

Mr. S. H. PRATER: I have been asked by the Junagad Darbar to speak about the Kathiawar lion. The lion is now limited in India to the Gir forests in Kathiawar. Formerly it had a very much wider field. This is not a species peculiar to India by any means. It represents the Asiatic race of the lion. It was once found in Persia, Mesopotamia and Syria and is now probably limited to the Gir forests where it has been given protection by the Junagad Darbar for many years. But a survey made quite recently shows that there are perhaps only about 70 head alive in the Gir forests. During the hot weather, the lions remain in these forests and do not come out. But as soon as the monsoon sets in, they have a tendency to migrate from the forest areas into the surrounding country, and it is then that numbers of them are shot. To prevent this would require the co-operation of the surrounding States. As far as the Gir forests are concerned, they are protected by the Junagad Darbar. But the danger is that their number is so small that any disease amongst them would result in the extermination of the entire stock, and a most interesting species would be put out of existence in India altogether.

I am asked to represent the Bombay Government and so I would also like to refer, if I may, to the Sind Ibex and the wild Ass. These are two species which require rigid protection in the Bombay Presidency. The Kirthar range in Sind is the only area where you have Ibex. In the Karachi Dada section of this range, which is directly under Government administration, the condition of these animals is deplorable. A survey taken by a member of the Bombay Natural History Society quite recently showed that almost one-third of the stock had been exterminated

in this section of the range. A recent report which I had from the Conservator of Forests confirms this. In the Kohistan section of the range, in private land under private control, the condition of these animals is much better owing to rigid protection. The protection of the Sind Ibex in the Kirthar range, which is outside the control of the Forest Department, is at one with the problem of protecting wild animals outside forest areas, which is a most difficult problem. The Chief Commissioner in Sind issued orders to regulate the shooting of these animals even during the close season, but as the Bombay Government have pointed out, they have not the effect of law and can not be brought in under the Wild Animals Protection Act. Unless something really effective is done, it is quite possible that these animals will be completely exterminated from this area. Of course, the ooriyal is found in the Punjab Salt Range, and Kashmir, but the race in the Kirthar is a special race and ought to be protected.

Another animal in the Presidency, which I would like to mention, is the Cheeta. It formerly had a very wide distribution. It is to be found in the open forests in Bengal and Central Provinces and Bombay. At one time it was reported to be fairly common in the United Provinces, Berar and the Central Provinces and the Kathiawar, but now it is exterminated from there. You get reports of its occurrence in the Berars and C. P. and in the U. P. but whether it still exists in the wild state in India, it is difficult to know. Probably, there are a few left. This is a species which is faced with complete extermination. These are the animals which require special protection in my Presidency. As regards other species, the position is fairly satisfactory in places where the forests are very dense, and there is scarcity of surrounding population.

In the Kanara forests, the density of the interior forests, saves the animals more or less and all those factors such as exploitation and penetration of forests or poaching are reduced in their adverse effect. In the northern parts of the Presidency, in Khandesh, which once contained a profusion of wild life, the position is less satisfactory, because the forests are broken up. The position is even worse in the central districts of the Presidency, say Poona and Satara. Here, most of the wild life has been practically shot out already, and it is only a question of time when it will be exterminated altogether from these areas. In Kanara, the condition is satisfactory. The main defence that wild life gets is from the actual nature and density of the forests.

Major J. CORBETT: I would like to say something about our musk deer. They have been nearly exterminated. The stock has been reduced by 90 per cent. It is not only shot but is also netted. It is shot and netted not so much for the sake of the flesh, but for the sake of its musk pods which is more or less valuable. This is done by poachers who go up specially for this purpose. I do not think it will be very difficult to control the poaching of this animal.

Mr. C. H. DONALD: In the Punjab, the musk deer has decreased in the last 4 or 5 years. As Major Corbett has pointed out, it is very valuable and is also an extremely easy beast to shoot. In spite of protection in the Punjab, it has decreased in recent years.

Dr. BAINI PRASHAD: Mr. Shebbeare mentioned that there was some sort of protection in Bengal. I would like to draw the attention of the Conference to a fact which came to my notice in connection with a case which

was drawn at Mr. Shebbeare's instance by the Calcutta police in reference to 3 or 4 horns which had been recovered at one or two raids from Chinese who were dealing in those horns. As most of you would know, the horn of a rhinoceros is very valuable particularly to the Chinese who are prepared to pay almost fabulous sums for it. There were 3 or 4 horns which were supposed to have been got from poached animals from the forests, but the difficulty was to prove it. A Swedish naturalist had come over to Bengal and written a fine book in German on the animals, and it was shown by actual photographs of the large number of skulls, etc., that the animals had recently been killed. There was no doubt that poaching was going on in large numbers in spite of the Act. The police brought up a case. The question arose whether those horns were from Bengal or from some other part. These people got off simply on the ground that it could not be proved that the horns were of animals which had been killed in Bengal, though there was a special notification of the Government of India also—I brought that point in evidence—according to which no parts could be sent by post or other means out of the country. It was almost impossible to prove that these were horns of animals which had been killed in Bengal. If the animal is to be protected, the Act needs revision.

Mr. CANNING: I do not think any animals are in danger in the U. P. Generally speaking, the pressure of shooting is possibly greater in the U. P. than it is anywhere else, but we have been able to maintain in the forests a fair herd of game animals. If the pressure increases, we have to increase restrictions, but I do not think we have anything particular to say under this special point of the rarer animals except regarding musk deer which has already been dealt with by Major Corbett.

Mr. MACHAYA: In Mysore we are concerned with bison, sambhur and spotted deer. Bison is well protected by its habits. It is found only in very dense jungles along the Western Ghats, but there is a certain amount of poaching done. In some parts a considerable diminution has taken place owing to rinderpest. Villages are scattered about all along those forest and the village cattle infect the bison. Seven years ago in one of our jungles we lost almost all the bison, and about 3 years ago in the north of the State along the Western Ghats a similar havoc was wrought by rinderpest. I think we must get some relief from this pest. As regards sambhur, especially in the Ghat regions, we have given considerable concessions to villagers in the matter of guns and in an area of 5,000 square miles there are about 5,000 gun licenses, and as sambhur and spotted deer are considered a great delicacy by the villagers, a good deal of loss can be attributed to this cause alone. In the coffee districts particularly, where every coolie seems to possess a gun, sambhur and spotted deer are considerably destroyed. Though the game rules are very rigid, it is very difficult to locate the offenders and take necessary action.

Mr. CHAIRMAN: Would any other gentleman like to speak on the general question of item No. 1 before we go on to the detailed items under this head.

Sir PETER CLUTTERBUCK: I should like to say a word about the Kashmir musk deer, the only animal which appears to be seriously decreasing in Kashmir, and that is because all the traffic in musk pods is done through

the post. Unless it is made illegal to send musk-pods by post—each pod fetches about Rs. 25 or Rs. 30—it will be very difficult to stop poaching.

Col. E. J. Ross: From what we have heard it seems to me that in the case of these rare animals or those whose produce is valuable, internal protection seems to be of no avail and the best way to protect them is to get at the sale through the customs and make things like rhino horn and musk pods complete contraband everywhere. That seems to be the only answer.

Mr. CHAIRMAN: I think we shall be able to deal with that more fully under one of the further items.

Mr. J. WHITEHEAD: Buffalo are now very scarce in the Government forests of the C. P. They are only found in parts of the eastern C. P. We are doing what we can to protect them and no buffalo is allowed to be shot in Government forests. They exist in larger numbers in some of the bigger zemindaris in the east of the C. P., and I believe they are still more numerous in some of the states to the east, such as Bastar.

Mr. A. J. W. MILROY: The pink-headed duck is very rare in Assam and there are probably only 4 or 5 pairs left. Unfortunately they are very difficult to protect. During my tours I found that owing to some epidemic of disease an Indian doctor who had been sent was armed with a gun. He had been shooting these duck and eating them, unaware of the fact that their skin is worth several hundreds of rupees. But their habitat is very isolated and if anybody was put on to protect them on Rs. 20 or Rs. 25 a month, it is felt that the great danger would be that he would make a business out of it.

Mr. T. R. PHUKAN: In Assam, we are interested mostly in rhino. We have adopted effective means of protecting them against sportsmen but not against poachers, and that is what we are mostly interested in. In the same way the Local Government can issue instructions for the protection of the pink-headed duck, but the difficulty would be to keep poachers from getting at them. For instance, we are not allowed to shoot rhino anywhere, but a tenant of mine came to me a day before I left for Delhi and said "Sir, I have killed a rhino, would you like the horn?" And we have established sanctuaries, but the net result is that sportsmen are not allowed to go anywhere near them—Mr. Milroy is very strict about that—but poachers go and kill these protected animals and sell the horns for Rs. 1,200. I am therefore very much interested in hearing suggestions for stopping the depredations of poachers. Our hill tribes are particularly bad in this respect and kill for the sake of killing. I am interested in feathered game also, and we have all varieties of ducks in Assam, but they are getting rarer, chiefly because of wanton slaughter on the part of individual nonsporting gun holders. I think this wanton destruction should be prevented. Some weapons have to be given for crop protection, particularly against elephants who sometimes come in herds and destroy crops. There used to be kheddah operations at one time and elephants were captured in large numbers, but to-day the price of an elephant is less than that of a good horse, and therefore these have been abandoned by Government, with the result that elephants are increasing in numbers and some measures must be taken in reducing these numbers. But as I have said, I am, mainly interested in the adoption of effective measures against poachers of rarer games. We should improve the sanctuaries, make roads into them to enable people to go and interest themselves in our fauna.

But there is always the old story of a shortage of funds. The present arrangements are not in my opinion at all satisfactory; the local officer in charge may or may not be interested in it. We have heard about the manufacture of guns and rifles for the purposes of the terrorist movement, but you may be surprised to hear that in Assam we have such manufacture for the sake of killing rhinos; they are crude weapons but effective enough for their purpose. I was told the other day that in Mayurbhanj an elephant had been killed only with arrows. Mr. Milroy is proposing to have other sanctuaries provided he can induce Government to sanction a little money, but there will be no use of them at all unless you can get effective protection against poachers, and our difficulty is all the greater because we have to protect almost everything, even peacocks, against the shooting of which there is a general aversion in and around Delhi and elsewhere. Then in our province, we have reserved forests, where shooting is prohibited absolutely, unclassed forests, where shooting is not absolutely restricted, and vast areas of other jungle full of games where anybody can shoot anything without a permit. We have to look into these facts and see what portion of the last-named areas should be converted into reserves. A rhino travels a good deal and may easily be killed in these non-prohibited areas.

Mr. CHAIRMAN: I think we shall deal with that under item No. 3.

Dr. BAINI PRASHAD: I suggest that there is one more animal which also deserves a certain amount of consideration. It is the monitor lizard. During the last 20 years a big trade has developed in the skins of this animal and large quantities are exported from Calcutta and other seaport towns. The Society for the Protection of the Fauna of the Empire have referred at times to the need for protection for the monitor lizard and I suggest that these animals might also be added to the list.

Mr. CHAIRMAN: Does everybody agree to that? (The meeting expressed assent) Gentlemen, it appears from a general review of the position of the fauna of India that the following animals are deserving of special consideration:—

> All kinds of rhinoceros; the wild ass of Sind; the Sind ibex. the Kathiawar lion; the musk deer; the buffalo; the monitor lizard; and the pink-headed duck.

Mr. A. M. DAVID: In the Punjab under our new Act everything is protected except what goes on to one or other of the Schedules. Otherwise all birds and animals are protected.

Mr. CHAIRMAN: Gentlemen, I think we have got the general question of protection settled.

We had better now go on to consider item 1 (*a*) (*i*)—"The desirability of definitely laying on the Forest Departments the duty of preserving fauna and flora in the areas in their charge".

Many of you may think that there is no particular object in this. item, *i.e.*, that the Forest Department naturally looks after the fauna in the Government forests, but that is not always the case. I think Mr. Wimbush will be able to tell you that until lately the Forest Department in Madras were not in charge of the shooting rules inside the forests.

Mr. A. WIMBUSH: Not entirely that, Sir. The administration of forests was in the hands of a District Forest Officer, but the Collector was the man who issued the licences, although he sometimes in some districts deputed that work to the Divisional Forest Officer. But the Conservator was not mentioned at all in connection with shooting, nor was the Chief Conservator. But I do not want to say anything more about that because in the last few weeks, after many years, the practice has been changed and now the shooting is entirely in the hands of the Forest Department, subject to co-operation with the Revenue Department. The Madras Game Laws and the Shooting and Fishing Rules are to my mind entirely satisfactory now.

Major J. CORBETT: Personally I do not think there is any harm in the game remaining in the hands of the Forest Department, but not under the present conditions. The senior members of the Forest Department probably realize, and in future will also realize, that the game is a particular charge on them. But the subordinate staff does not realize that they are in any way responsible for the game in their charge. I think I am correct in saying that in the United Provinces no man has ever been rewarded or promoted for looking after the game in his charge. If the subordinate staff are encouraged and made to realize that they are responsible for the game in their charge, I am quite willing that the Forest Department should remain in charge of the game, but, as I say, not under the present conditions or the present rules.

Mr. A. WIMBUSH: I do not know whether Major Corbett is referring only to the United Provinces or the whole of India in saying that no forest subordinate is ever rewarded for protecting game. In Madras at any rate, we are very insistent on giving rewards in the detection of cases of poaching, and I read only yesterday, that the rewards given year before last amounted to double those given in the previous year and that the rewards last year were more than double of the year before. We put great pressure on the local officers to recommend rewards and sanction them, if within their own powers, in connection with the protection of game. I think it is very essential that that should be done.

Mr. E O. SHEBBEARE: The same applies to Bengal.

Mr. F. CANNING: While I am unable to say definitely off-hand that no rewards have ever been given in the United Provinces to the subordinate staff for game protection in poaching cases, I certainly can say that we should look upon good work by a subordinate in the protection of game in exactly the same way as we should in any other branch of his work. The fact is that in the Forest Department rewards very rarely come to anybody. (Laughter). It is rather difficult for a subordinate alone in the jungle to show that he is worthy of reward, and I think what is most disheartening to the forest subordinate is not the lack of rewards but the difficulty he has in having the case properly taken up when it comes before the magistrate. Often it fails because there is inadequate evidence, or the evidence of one forest guard cannot be taken, or the case is misunderstood and not considered sufficiently important—a mere shooting case. That is what is disheartening to the subordinate. I admit that the subordinate may not look at the question of game preservation in the same way as the sportsman who is keen on shikar, but at the same time it is not entirely the subordinate's fault that he does not do more.

Mr. F. W. CHAMPION: Speaking as a Divisional Forest Officer in the United Provinces I am quite certain that almost every Divisional Forest Officer marks down the men who take special steps to deal with poaching etc. as good men. Time after time we take the cases to court and there the offenders are let off as the evidence is considered prejudiced, or they are fined eight annas, and the ordinary Divisional Forest Officer does not push the cases. But it is not fair to put the blame on the forest guards. They very often bring such cases to the Divisional Forest Officer first and he decides that they are not worth going on with because he knows from experience that the evidence will be considered prejudiced and that it is useless to take the case to court.

Major J. CORBETT: I did not want to make a charge against the Forest Department. I just wanted to say that the subordinate staff were not sufficiently encouraged.

Mr. CHAIRMAN: Gentlemen, if you agree and you confirm that it is desirable to definitely lay on the Forest Department the duty of preservation of fauna, I think you may get some better results in the future than you have had in the past. On the other hand, in criticising the forest guard you have to remember he is one man alone in the jungle. Very often he is confronted with 20 armed Gurkhas, and it is very difficult for one man to deal with a large body of armed poachers.

Col. E. J. ROSS: May I make one suggestion. Personally my experience of the Forest Department is that they have done extraordinarily well in the preservation of game, with limited resources. The point I wish to make is that if the revenue from licences etc., on were used to increase the forest staff who carry out this work, it would help considerably.

Mr. CHAIRMAN: There I entirely agree with you and I think we can deal with that effectively later on. I entirely agree that the revenue from licences and from shikar should be credited to a separate fund to be administered in the interests of game preservation, and not merely credited to the general revenues of the Provincial Government. (Applause.)

Mr. S. H. PRATER: Sir, the question of fixing the responsibility on the Forest Department is certainly a good point and it rests with the Forest Department to accept that responsibility and to carry it out to the best of its ability. But at the same time the Forest Department in present circumstances is considerably handicapped if you consider the areas which they have to patrol. In the Bombay Presidency, if you take the East Khandesh District you have something like 500,000 acres of forest and you have a patrolling staff of about 106 guards, out of which some are detailed for other routine duties, and actually you get one guard to some 10 square miles. The Chief Conservator of Forests in his letter to me said that the Department was by no means apathetic, that it was doing its best, but already it was understaffed and had not sufficient staff for its legitimate duties. Without some form of assistance the Forest Department cannot do much more than it is doing at present. Therefore the suggestion generally made is to relieve the forest officers of this work, seeing that they have other multifarious duties to perform and to create within the Forest Department a special branch for the protection of game, a Game Warden and staff. If that branch worked under the Chief Conservator of Forests, then a major cause of friction would be removed and something would be done, and I think it is for this Conference to consider that point very carefully.

Mr. AKHTAR ALI KHAN (Bhopal): The game rules apply only to the forest areas, but owing to the advent of the motor car and to easy access to the forests, poaching in the past increased beyond bounds and the game was decreasing very much. At that time the Forest Department only was responsible for the enforcement of the game rules, but it was found that the Forest Department was not very effective in stopping poaching. A special Game Department was organized under a Game Warden, who was under the Conservator of Forests. But one year's experience showed that instead of being useful, the creation of that Department absolved all the forest officers from the responsibility of protecting game in the forests. They thought that it was no longer their duty to stop poaching. Of course the Game Warden's staff was not as numerous as that of the Forest Department, with the result that the evil increased. In 1930 a special legislation was enacted. Under this enactment the Government can extend any provision of the Game Act to areas outside the Government forests. The responsibility of enforcing the game rules so far as protection is concerned has been jointly enforced on the Forest Department and the Police Department. The result after five years working shows that poaching such as that referred to by Mr. Phukan has been put a stop to to a very great extent. The only problem before us now is how to stop poaching by unscrupulous car owners who go out and slaughter animals with the aid of spot lights. That is our only difficulty. By making the Forest and Police Departments jointly responsible for the enforcement of this Act and by extending the provisions to other than forest areas we have been able to stop local poachers from killing game. Of course we have not got any very rare species, but what we have is being preserved.

Mr. C. H. DONALD: Speaking for the Punjab, the trouble is that there are lonely tracts where there are very few people able to help in enforcing the rules. It would be much better if we could have a system of rewards, or in the alternative, give powers to certain recognized people as honorary wardens to help the forest staff or the game staff. I think something is needed in the way of encouraging the public. A lot has been said about the subordinate staff. Well, one might be able to bribe half a dozen people, but one cannot bribe the public, and I think it would be infinitely cheaper in the long run to give a few rewards and get a few convictions through the public than to have a staff that is bribable. In California they have what they call. "One Dollar Wardens". Under their charter the Association of Game and Fisheries can employ for this work anybody who is paid by the Association. Therefore a large number of willing workers receive one dollar a year, and they now number some thousands, and do infinitely more work than would otherwise be possible.

Mr. A. WIMBUSH: In regard to Mr. Donald's suggestion, I have had experience in one division in Madras where a very keen voluntary worker did his best and was allowed to appoint two of his own jungle tribesmen as Assistant Wardens. I am afraid the result which would almost inevitably happen did happen in this case. The volunteer wardens and their subordinates really would despise the forest subordinates and the volunteer people would report that certain iniquities were happening, in a certain forest and in theory it might be all right. But the ordinary instinct of the average Divisional Forest Officer is, generally speaking, to back up his own people if he can. He probably has reason to suppose that the jungle

men who come sneaking to their master complaining about his subordinates are every bit as much rascals as the forest subordinates themselves. You have the Divisional Forest Officer up in arms. He says he has his own opinion about the subordinate supplied by the volunteer Warden. He finds perhaps that the local ranger and his staff who pay small attention to detecting cases are out to belittle the efforts of the volunteers; so that although on paper and in theory it is an admirable arrangement, in practice it is most frightfully difficult to work.

Mr. CHAIRMAN: Gentlemen, this is what I have noted down. If anybody wishes to say anything more on the subject, will he please get up and speak. "The Conference agreed that the duty of preserving the fauna in areas under their charge should be definitely laid on the Forest Department and that the revenue derived from shooting and fishing licences should be specially earmarked for the protection of game and the payment of rewards."

Mr. F. CANNING: The Finance Departments would not give this money. They are guided by the Council finally and the Council would not stand for it. If non-official opinion will persuade the members of Council to support us in this, we shall get it. It all depends on public opinion and unless we have got sufficient money, we can't do much. This Conference here might help us in that matter. It is not for want of trying to get the money that I have made this suggestion. In the United Provinces the Government went many years ago to the extent of passing an order themselves when they first instituted fees and licences for shooting. They said they were not going to make money out of it: it was all going to be devoted to the interests of game. If we get the money that is paid by way of license fees, it would be very good. It requires public opinion in the Legislative Councils.

Mr. CHAIRMAN: Don't you think that if this Conference makes a remark to that effect it may assist matters. (Several Members: Yes.)

I would especially ask non-official members here and members of Provincial Councils to take a personal interest in this matter when they go away from this room after this meeting and talk to their fellow-members in Council and try to impress upon them their own particular views. It is no good coming here and saying that it is the duty of the Forest Department to protect game and that this and that should be done. The Forest Department is considered a commercial department, and although the Forest Department is quite prepared to do the utmost they can within the funds placed at their disposal they cannot stop poaching unless they are given a staff to deal with the poacher and I think it is for you, gentlemen, to get up in Council and insist on it. If you wish the rhinoceros to be preserved there should be staff provided for it and Government must be prepared to provide the necessary funds to preserve this interesting animal.

Mr. S. H. PRATER: I think the actual relationship between the various game protection societies which are now being started in different parts of India with the Forest Department needs a little further elaboration and should be considered. As has been pointed out from Madras, there have been instances in other provinces where voluntary work has been done

and where difficulties had to be faced. I suggest that the point may be a little further considered and something decided in reference to this point. There is no use having these private agencies or private individual volunteers to work unless you definitely decide what is going to be the relation between these bodies and private individuals who are working for the same end.

Mr. CHAIRMAN: I shall refer this point for further consideration to Messrs. Wimbush and Shebbeare, and Major Corbett who have experience of dealing with these societies. I think we had better go on to Item No. 1 (*a*) (ii). "The destruction of such wild animals, such as wild dogs, as tend to decrease other and more important game."

There is really not very much to be said on the point. The Forest Department already issues rewards for the destruction of such wild animals. If anybody wishes to speak on the subject and make further suggestions, I am sure the Conference will be very glad to hear him.

Sir PETER CLUTTERBUCK: Would it not be perhaps more easy to consider this matter when dealing with the question of sanctuaries? The question of destruction of adverse carnivora turns on the major question of the management of sanctuaries.

Mr. CHAIRMAN: We will consider it later on when we deal with sanctuaries. Now we come to (*b*) "Outside Forests" and there are three items here.

1. Inclusion of life histories of wild animals in school text-books.
2. Collection of statistics of important and rare wild life in India,
3. Ornithological societies for the protection and study of bird life and nature study.

As regards No. 1 this matter of studying life histories of wild animals is a matter which the younger generation in Europe has become much interested in in the last few years and I can see no reason why we might not be able to interest the young men of India in a more intelligent knowledge of the animals inhabiting their own country. No. 2 is a matter for the respective provinces and States to decide. In this respect they could be assisted by any unofficial society which would be willing to help in this matter.

Mr. MILROY: I think those of you who have sons at Home will agree with me that the outlook now-a-days of English boys is very different to what it was when we were young. I remember that when we were young we used to go out and collect eggs from birds' nests. I was astonished when some years ago I went Home to find that the present day boy who goes out is not so keen on making collections of eggs as he is in studying the habits of birds and other animals and this is almost entirely due to the lectures which are given now-a-days at schools with lantern slides. It is the same in regard to animals. If something of that sort is done here, it will induce a certain amount of interest which at present is lacking. I know that some of the people we recruit in the Forest Department in India have no interest at all, because they have got no knowledge of wild animals. I may here relate a perfectly true story. One of the candidates for the I. F. S. on being asked why he chose the Forest Department, said he was interested in forests. He was asked whether there were wild elephants in the part of India from which he came.

He said "Yes". On being asked as to how they were caught, he replied that it was very easy. "A gate is put up at the entrance to a cave frequented by elephants and a goat is tied up inside, the gate being closed to trap the elephants which enter to eat the goat". I think there is obviously great scope for giving education to children by lantern slides and giving lectures on such matters, or if that is impossible, giving them books to read about animals and birds and getting some sort of interest aroused in them.

Mr. C. H. DONALD: In the Punjab, I have been giving in the last few years a good number of lectures in various schools, with lantern slides, on birds, etc., and I must say that the reception was encouraging. Boys are very interested in the subject and want to learn something about it. I am perfectly certain if we do propaganda on these lines, give them text books and a general summary as to what birds are beneficial and what birds are not, you will find the ordinary zemindar taking a keen interest I have seen a good deal of that in the Punjab and the Punjabee at any rate takes a very keen interest.

Dr. BAINI PRASHAD: At the last meeting of the Science Congress held at Calcutta, Botany and Zoology sections were asked to consider the question of introducing nature study for the classes about the matriculation standard, *i.e.*, secondary classes, in order to give the young students an idea of nature as a whole. Various teachers present at this Conference brought up various points in reference to the difficulties of introducing any further courses of this type in addition to what they already had to teach the students. I would suggest for the consideration of this Conference whether it would not be possible for the Conference to send up a recommendation to the educational authorities in the various provinces to consider the question of introducing nature study as one of the optional subjects. I doubt very much whether it can at all be included as one of the subjects which they must study, but if they could have a few lectures or classes in the way of an optional subject for giving the young students an idea of these subjects, it would be helpful.

With reference to the question of including life history of wild animals we are not fully oriented but a certain amount of work has been done. Some mammals have been treated in the way mentioned in the two appendices to the Journal of the Bombay Natural History Society; and something more might be done in that way which might make the material available. The difficulty is to get the correct books from which even teachers might get necessary information.

Mr. PRATER: In England there are a certain number of Natural History books at popular prices and boys and girls naturally interest themselves in them. Here in India you have got very little literature. Most of it is technical. Such popular books as have been published are beyond the reach of people who cannot afford to pay for them. Our society has been trying to do something by publishing this series of articles on the wild animals of the Indian Empire which will cover all the mammals and have coloured illustrations and it might serve as the basis of a simplified text book for schools. Of course the whole question is who is going to write these books. Somebody has got to simplify them for children. Publication is an expensive matter. The series of charts of birds of India which we published cost us Rs. 28,000 to put on to the market. There is the question of writing, production and publication of these books. A good

deal can be done in that way. As regards nature study, I was lecturing to a refresher course of secondary teachers recently. Nature study is not Natural History, it is using Nature as a medium to increase the child's powers of observation, but it does give the child a sense of companionship, with life out of doors and it develops in him a love of nature. At the Museum in Bombay the society started a series of nature study lectures and about 30 schools were sending children to the museum. There were daily lectures given at the museum. In this way 5,000 children attended the lectures and they were intensely interested. We had applications from more schools than we could deal with. Government said it was too expensive to carry on and we had got rid of our nature study lecturer and stopped the whole thing. While I was in America and Germany I realised the great importance which they attach to nature study, because it is something quite apart from the ordinary cramming methods of education. You are making children think and observe things for themselves. That is the important part of it. But teachers themselves are not trained in nature study, and the proper training of teachers is the first step and this implies suitable books for their use. The pupils don't have books for nature study. They have got to observe. The whole question resolves itself into this. Governments themselves or the Education Departments should interest themselves in this matter and help societies or finance people or finance the production of such works. If that could be done these works could be produced to help teachers and children in schools.

Mr. CHAMPION: May I read an extract from a letter which I received from some Indian whom I don't know?

"The reason for this ignorance, and antagonistic attitude of the public towards the scheme, lies elsewhere. Even if the grown up people of our country are quite ignorant about the wild animals of their country, they regard these poor creatures as devilishly cruel, who will devour them at the first sight. Nor do we possess any literature (vernacular) dealing with the subject. The fundamental mistake lies in our educational system. The study of Natural History (of our own country) is not included in the curriculum. They are not taught to observe and love these objects of creation. On the other hand, many wild stories are told to them by their ignorant parents. In the end, they become not only haters of wild life, but they become even cowards."

Mr. ROBINSON: I have got very little to add to what Mr. Prater has said. In India there is very little literature available for ordinary public on wild life. All the good books on shikar and on wild life generally are expensive and are beyond the means of the average Indian in the country and in the towns and especially beyond the student who cannot afford to buy them. If we have game preservation societies started all over India working with the Forest Department very much on the lines of the Nilgiri and Palni Game Associations and if they have some funds they can do a certain amount of propaganda. In Travancore we have been doing a certain amount of propaganda in the local press. We have taken articles from good shikar books and from the Bombay Natural History Society's magazines and these have been translated into Tamil and into Malayalam and have been published in all the local papers. The press have very kindly done this free. Some of our papers are illustrated papers, and we have had plates copied from the Bombay Natural History Society's plates or other shikar books. If that could be done by Governments or by the Game Associations which are sure to have some funds we might be able

to do a lot of propaganda not only for children but for grown up people. Commissioners of Boy Scouts might encourage Boy Scouts, give them field days with nature studies. We have no literature in the vernacular and that is the difficulty. We must have cheap literature available for the poor classes of the people.

Mr. CHAIRMAN: We now come to Item 1 (*b*) (2)—"Collection of statistics of important and rare wild life in India."

Mr. SHEBBEARE: I think this question will have to be left to shooting clubs and associations, where they exist, as far as we are concerned. We have got a little Natural History Society in Darjeeling but I think it would mostly be a question for private enterprise—the collection of statistics. I think a report should be published quite separate from our annual administration report by Forest Departments every year about the preservation of wild life and how matters stand.

MR. CHAIRMAN: I think, gentlemen, we might confine this inquiry, which we hope to start, to the animals which we have already mentioned under item 1. I do not think there is any necessity to make a census of all the wild animals of India. We might make a note in our proceedings that it is desirable to collect statistics as regards these animals and ask the authorities protecting them in particular localities to do what they can to obtain some better information than they have at the present moment regarding the numbers of these rare wild animals that still exist at the present day.

Khan Sahib ALLAH BAKHSH: Mr. President. It is not quite clear what is meant by the collection of statistics. The idea of collecting statistics is to find out how the game is responding to the environment and how the numbers are changing from year to year. We do not want to know only the number of animals left. The idea is to know the factors by which the wild life is affected and how to control these factors. This applies not only to the animals in the special list but to other important animals as well. For instance, in the U. P. the tiger is an important animal and we have not included it in the list and it would be interesting to know from year to year if this species is becoming rarer and, if so, the reasons for it, so that we might take steps to protect it further. This is the object of the proposal.

Mr. CANNING: I should like to add that while the statistics of the animals shot in reserved forests are recorded and are probably fairly accurate, there are no statistics regarding the animals shot outside the reserved forests. I have got here actually my own notes of the animals shot in the reserved forests for the last 17 years and they do give an indication—they must in time give an indication of the progress of the stock of animals in our forests because although you may have in an exceptional year a number of well-conducted parties who get a large number of animals shot, you may very soon find the stock going down. But I am completely at sea as regards a large number of animals; for instance, tigers which are shot in considerable numbers outside the reserved forests and I am very much afraid that my conclusions which are based on statistics gathered inside these forests would be largely upset by what is happening outside Government forests. I would like this conference to recommend that if possible some agency outside the Forest Department should collect the statistics of the more important animals. By that I do not necessarily mean the more rare animals but all the animals that are more important in that particular province and that are shot outside reserved forests.

Sir PETER CLUTTERBUCK: I should like to propose, Sir, as regards the item, that you strike out the word "rare", because I think outside the research forests it is not so much a question of statistics of rare animals but more the actual wholesale destruction that is going on. After I have said a few words, I hope you will ask somebody representing Delhi to tell you what has happened in Delhi during the last ten years. The areas near Delhi used to be the finest shooting areas in the country and now I fear one would have to labour very hard to get anything. K. S. Allah Bakhsh said that the idea of the statistics was not so much taking an inventory of such fauna as we have got as giving a progressive account of what is happening. But I do not see how you are going to do that until you make an inventory to start with. The first important point is to know what we have got and then to guard what we have got.

Col. ROSS: I agree entirely with what Sir Peter Clutterbuck has said. It is true not only of Delhi but of various zemindari forests in the United Provinces where sometime ago there used to be herds and herds of animals—chital especially—while the last time I was there they had practically all gone. And that does lead one to the conclusion that it is not only rare animals that want to be watched. I do not know how you are going to get the figures right. In Delhi, even as lately as 8 years ago, if you drove down the road to Palwal or Gurgaon, you saw countless herds of buck each herd containing two or three hundred in some of these places. Now when you are shooting, you possibly see 3 or 4 hiding in the crops but they have nearly all gone. In many places for the last two or three years partridges have practically gone. There are very large areas here in which 4 or 5 years ago there were partridges all over the place. Now you find a clear-cut line all over the country. On one side of the line you find birds everywhere and on the other none at all. This is due to netting. I do not quite know how you are going to keep statistics of birds. I think the Society could furnish a very good report each year. I think statistics is rather a wrong word, because I don't see how statistics will be compiled. Again, I do not think statistics of animals shot are of much value. Take the chital—what you want is to get some sort of an idea of the numbers surviving—and I think these associations probably could do that.

Mr. KIRKE SMITH: I have had very little time to study this question as I find my time wholly taken up with hunting hounds and looking after them. But I can say that even during the last two years, I have noticed that any number of black buck have been shot down. Last year, there was a large herd by Barari and suddenly in about a fortnight's time the whole of it had gone. From my inquiries I find that they are being shot for meat for the market. I think it is the same with partridge.

Mr. MILROY: Sir, I think it is quite necessary for this conference to recognise that there is unlikely to be any game in India outside definite areas which are definitely reserved. In very few countries of the world where there is anything of population do you find game outside definitely reserved areas and if people want to preserve game I should think that it would be necessary to start a Game Association and arrange with them to take the shooting just as in England you can take the shooting from a number of farmers. But to preserve game in definite areas it seems to me will be a very difficult task.

Mr. PRATER: Sir, the Forest Departments include statistics on game in their reports. It would, I think, be very advantageous if these statistics were collected and published together by the Central Forest Department and made available to scientific societies and other organisations who might be able to find them useful in arriving at conclusions about the fauna of the country. If that could be done, it would certainly help because we could use these statistics.

Mr. CHAIRMAN: Well, I do not think there would be any difficulty. Certainly so far as I am concerned there would be no difficulty whatever in my office compiling statistics of that sort, if the provinces that do not already publish statistics regarding the number of game shot in their forests, and the Forest Departments in the various States, would supply information of the sort. It would be perfectly possible for my office to publish a summary. But my office cannot do anything unless they are provided with the necessary information from all available sources.

Mr. PRATER: I am collecting statistics of tigers shot in India and Burma from the Forest Departments and most of the Indian States and hope to publish them in the Society's Journal shortly.

Mr. CANNING: May I make one suggestion. We have got to protect these animals. I think if we are going to collect statistics, we have got to start on one or two animals and try and see what we can do in this way. I think if we attempt to get general statistics in this way, we will get nothing at all. The statistics that we publish are not all the statistics that we have. There was a suggestion published a few years ago that tigers were getting rather scarce, so at the commencement of the season I asked the forest officers to have a census of tigers. I asked for it at Christmas time. We had it checked up at the end of the season. I think a certain amount of this work can be done. But I do not think we can count all the chital in the forests or anything like that.

Mr. CHAIRMAN: We will leave for the moment item 1 (*b*) (2) because I am trying to get concrete proposals on the subject put before the Conference. We will now go on to item No. 1 (*b*) (3)—"Ornithological societies for the protection and study of bird life and nature study."

Dr. BAINI PRASHAD: The word "Ornithological" might be changed to "Game Preservation Society" or something like that, because "Ornithological" does not really cover anything beyond birds, whereas we are trying to deal with the question of game as a whole.

Mr. CHAIRMAN: We have already dealt with that. This particularly refers to birds.

Dr. BAINI PRASHAD: If you read further, Sir, you will find the words "and nature study". You can call them either Game Preservation or Natural History Societies. They cannot be Ornithological Societies and deal with nature study as a whole.

Mr. E. O. SHEBBEARE: "Natural History Society" would be better.

Col. A. OLVER: There is rather an important agricultural aspect which comes in here. We have been asked two or three times from other countries and this country to obtain information as to the food habits of particular birds, both from the point of view of the damage they do to crops and also what they could do in protecting animals from parasites, and so on. That is a very important aspect. These societies might possibly be able to be of very great assistance in that matter.

Mr. NICHOLSON: It will be better to encourage the formation of societies in provinces where they have already been established, and these societies can very well take up this question. We have not yet started Ornithological societies in Bihar and Orissa. The matter is being contemplated, and the more encouragement one gets, the better.

Mr. CANNING: I want to enquire from the United Provinces Game Preservation Society whether they think that this could also be included within their scope. What I have been trying to press on them is the formation of local committees. If there is only one society working for a whole province, it is difficult to get anything much. If you have a local committee working, that is the way in which I expect the society to help us most. Perhaps we might hear whether the United Provinces Game Preservation Society think that they could take this up.

Major CORBETT: We have already done a little in that line and we hope to do more in the future. Our birds are the same as in the Punjab and the Punjab people have gone far ahead of us and are issuing text books, which are very complete and good indeed. We wanted to introduce them into our province, and His Excellency told me that he would take up the matter with the Director of Public Instruction and try to get them introduced. I am not sure whether they have not already been issued in the Punjab as a text book, but in any case, we want to have them in our schools as text books. We have already issued many thousands of pamphlets about bird protection and we hope to do it on a larger scale as soon as funds permit.

Mr. CHAIRMAN: I think it is the sense of the Conference that it welcomes the work being done by existing Natural History Societies and hopes that such societies would be formed in the future in places where they do not at the present moment exist.

(This was agreed to by the Conference.)

Mr. CHAIRMAN: We will now pass on to item No. 2—"Inoculation of village cattle against infectious diseases particularly in the vicinity of game preserves for the protection of wild life."

Col. A. OLVER: Sir, you already have Mr. Ware's note on this subject and it is not necessary for me to go into much detail. I would like to make a few remarks, however, to emphasise the practical importance of this subject. It has already been mentioned this morning that rinderpest is a very serious matter and causes a great deal of disease and mortality amongst, for example, bison. We have experience of a great deal of mortality having been caused amongst cattle which was apparently traced to wild animals. It works both ways,—not only in this country but in Africa, also. Rinderpest was introduced first and passed South beyond the desert country. There is no doubt that the wild game were mainly responsible for its spread right away to South Africa and the losses amongst stock due to that parasite were very enormous. In both cases, the disease is kept up by "carriers" which remain "carriers" we know, for very considerable periods. The same would apply to wild animals. Fortunately, we are now in a position to protect game against rinderpest very much more economically and efficiently than has been the case in the past. In the past, for example,—I was in the Soudan—we did try there to protect the Soudan against increase of rinderpest by inoculation of cattle along the frontier. At that time, it was practically impossible to do it. But we have now got to the position where we could give protection permanently. In the Soudan, the protection that we could

give was only temporary protection. Rinderpest is the most important disease. Tick fever is another important one. It causes very heavy mortality amongst domesticated animals. Although it has not caused much damage amongst wild animals, it is probably the main reservoir of keeping up the infection and getting to domesticated animals. It might become rather serious for the people of surrounding areas. As regards foot and mouth disease, it might spread to wider areas, but I do not think we can do very much. We have now got in every major province an organisation for carrying out investigations of the disease and the Veterinary Department can be of very great assistance to these areas, by investigating the causes of the disease.

Another important matter is the transit of cattle, cattle passing into these preserved forests and passing back again into areas and bringing the disease either from the wild game or from other cattle brought into grazing areas. It is a matter which affects and will affect the spread of contagious disease in this country, and it is a matter in which we hope to get further powers under the All-India Diseases of Animals Act. But for the present, we can undertake inoculation against rinderpest particularly in the surrounding area. It is very important to keep in touch with the Veterinary Department and to get them to assist us in the matter of arranging post-mortem and other investigations on the outbreak of a disease as it occurs in the reserved areas.

It was mentioned today that the most effective line of action in controlling the slaughter of animals for food is to control the markets. I do get a certain amount of information in connection with the Society for the Prevention of Cruelty to Animals. I suggest that some use might be made of this information. They get a good deal of information which they might be able to pass on.

Mr. WIMBUSH: The Madras Government have arranged with the Director of Veterinary Services to inoculate all cattle which are in the habit of entering bison areas, and the arangement, which it is rather difficult to enforce, is that no animal which has not been inoculated and bears a tatoo mark shall receive a pass for grazing in reserved forests and the bison areas. We are still collecting statistics to find out the number that is inoculated. There are certain practical difficulties. The forester who issues the permits has the Ranger twisting his tail to hurry up and bring in grazing revenue, and it is extremely difficult for the officer in charge of carrying out the inoculation to keep pace and get at the animals inoculated quickly enough. If he has a herd of several thousand cattle waiting to be inoculated and the forester with his book of permits waiting to issue the permits and collect the revenue, it is a little difficult for the forester to know what he is to do. It will take a few years before this is thoroughly organised.

Mr. NICHOLSON: Last year we decided in Bihar and Orissa to inoculate all cattle grazing in game areas. We consulted the Government of Madras and Central Provinces previously. I discussed the matter with the Director of the Veterinary Department, who was very keen. We met the cost. We sent out a man to inoculate all the bullocks which had been grazing. Only a few buffaloes were grazing there, and the Director of Veterinary Services started to inoculate the buffaloes. It proved to be too dangerous for the buffaloes, since the mortality was too high. As a result, we decided to do nothing in the future.

Col. OLVER: He was introducing single inoculation. This is a new process which has not been tested very much on buffaloes. In cattle it is perfectly safe. In buffaloes, there have been a few deaths. But they are getting over that difficulty. At that stage, they were not sure, and they were afraid to do it on buffaloes. I think you will have no trouble in the future.

Mr. NICHOLSON: If there is no trouble in the future, it will certainly be done in our province. There is no practical difficulty in the way. Nobody will be allowed to graze unless they are actually inoculated.

Mr. A. M. DAVID: Is this inoculation free or is anything expected to be paid for it?

Col. OLVER: In some cases, the provinces have done this free, that is to say, for their own cattle. But in this case, where it is specially done to protect bison, for example, they might expect some assistance. It is generally done free.

Mr. CANNING: The Conservator of the Western Circle, United Provinces, has taken up the matter of rinderpest menace with the local Veterinary officers. He told me that satisfactory arrangements were being made. Rinderpest in particular has been a very troublesome matter. It is one of the things that we certainly should have to take up when we form our new Circle. I believe inoculation is actually being done, and I believe the situation is satisfactory.

Mr. JIWAN SINGH: Inoculation adjoining big reserve forests would be possible, but it would be difficult in places where they have small patches of forests.

CHAIRMAN: I think the sense of the meeting is that the inoculation of village cattle against rinderpest is already carried out in bison areas in Madras and Bihar and Orissa and is being taken up in the United Provinces in co-operation with the Veterinary Department. This matter is of great importance not only for the protection of the game but also for domestic cattle grazing in forest areas, and the Conference considers that such protective inoculation should be extended wherever possible.

Gentlemen, we have not gone far with item 1 (*b*) 2,—"Collection of statistics of important and rare wild life in India". A resolution which is put before the Conference is—

"That the Conference is of the opinion that statistics in reference to game now incorporated in the annual reports of the Forest Department of various provinces should be collected together and, with additional information from Native States, published annually in the form of a general review of the rare and important game animals of India as a whole."

I anticipate the very greatest difficulty in obtaining information on which to base the report. You will ask me to write this report and I shall be faced with getting information from here, there and everywhere throughout the length and breadth of India, and I am sorry to say I shall never get it.

Mr. E. S. HYDE: We have figures collected and statistics compiled every year as in British India as to numbers of animals killed, etc., and we could send our figures on as an annual return.

Mr. S. H. PRATER: I collected statistics from various States about tigers and had no difficulty in getting them from States in India and in Burma.

Major SAJJAN SINGH: For the two or three species which are preserved you might get figures, but not for all, because no such figures are kept in Indian States.

Mr. N. R. ADVANI: In Indore State we have been keeping figures for Sambhur and Bison and Cheetal, and there will be no difficulty in submitting those figures.

Mr. S. C. ROBINSON: I think those States which have not kept figures will do so if they are asked to keep statistics of what is required.

Mr. F. CANNING: I would again urge that we should not ignore statistics of important animals shot outside reserved forests. We could certainly get them for tiger. The tiger is an important animal and I should like, if the Conference agrees, that this may be specially added to the resolution.

Mr. KHANDELWAL: Are the figures wanted for reserved forests or outside reserved forests?

CHAIRMAN: The Forest Department cannot provide statistics for animals shot outside reserved forests.

Mr. KHANDELWAL: In that case I do not know what use that will be. Animals like Sambhur and Black Buck are shot outside.

Mr. S. C. ROBINSON: We might be able to get figures of animals shot outside reserves in private lands through the village revenue staffs through their superiors.

CHAIRMAN: You may be able to get that information but I certainly cannot. If you want me to publish a statement for the whole of India I must be provided with the necessary information.

Mr. E. O. SHEBBEARE: As far as Bengal is concerned, I can assure you that no figures that I can obtain for you will be worth anything. I will do my best but I know that it will be quite impossible to get you anything like reasonable figures, even of the more important animals, because so many are shot by poachers; and as regards existing stock, which I take to be one of the points, it will be quite impossible. I can only give a guess at it. Every year in my annual report I report on wild animals destroyed, which means the number of tigers shot; well those figures were the ones which I gave Mr. Prater and they are probably about as accurate as anything I could get. But for other game I can say that any figures I can give you will be entirely *jhut mut*.

CHAIRMAN: I think all we can get and all the good we are likely to do is to ask the various Forest Departments to enter in their annual reports a statement regarding the game animals killed inside their forest areas. That will give you some sort of information. Some forest authorities do give that information while others don't, and if you pass such a resolution your desire could then be brought to the notice of all Forest Departments in British India and in the States, and it might induce them to enter the necessary particulars in their annual reports, and it would be possible to extract that information for what it is worth, and either publish it separately or anyhow keep it for anybody who wants it.

Col. E. J. Ross: Might it not be possible to enter a note on any species showing signs of decreasing in general terms.

CHAIRMAN: Yes, I think it might.

Col. A OLVER: That seems to me the most valuable part of the information if you could get it.

CHAIRMAN: I put this resolution before you—

"The Conference was of the opinion that the Forest Department should deal with game preservation in a separate page of their annual reports, noting the number of animals shot and any particulars of the increase or decrease of game animals or birds in their areas."

When there is a provincial Game Warden he will naturally in his annual report deal with the whole question of game in the area in which he is employed, but in the case of the Forest Department it can only deal with it in a section of their annual report. They are limited to a certain number of pages. I am sure most Provincial Governments will object to more than a paragraph dealing with this subject in their annual reports.

Mr. KHANDELWAL: I would suggest that the words "in British India" be added after the words "Forest Department", and an additional sentence be added to the effect that it would be helpful if Indian States would also do the same. So that the main resolution would apply to British India.

Sir PETER CLUTTERBUCK: Kashmir is already devoting a chapter in the annual Forest Report to Game Preservation.

Mr. S. C. H. ROBINSON: We will co-operate in any way we can. If we are asked we shall follow on the lines of other administrations.

(The suggested addition was not approved and the resolution as worded was approved by the Conference.)

CHAIRMAN: We will now start on item No. 3, which is perhaps the most important of any item we have to deal with, that is "Special legislation for the preservation of wild life (outside the Indian Forest Act) enacted in various provinces. What further steps are necessary in this respect?"

I think it will be the general view of members of this Conference that the protection of wild animals inside Government forests, whether in British India or in the Indian States, is fairly adequately carried out. I do not mean to say that it can not be better carried out. You have heard of the delinquencies of the forest guards in this respect, but the forest guard is no worse and no better than any other subordinate, and the Forest Departments have done their best and have obtained a certain amount of success in the protection of game in Government forests. But in areas outside Government forests the game birds and animals of this country have had no protection of any sort or kind. The Wild Birds and Animals Protection Act, the old one at any rate, was perfectly useless. It provided close seasons for game which nobody paid the least attention to. I myself have seen on the menu of hotels in Simla partridges netted in Delhi in the month of August, in spite of the Wild Birds Protection Act, and one of our duties here will be to consider what can be done outside the provisions of the Indian Forest Act, that is to say, outside the areas controlled by the Forest Departments of India, to

protect the wild life of India from the indiscriminate slaughter which goes on at the present time. Hundreds of partridges and snipe and duck are netted. They are sold alive under the most revolting circumstances in the towns of India, and I think we should endeavour so far as is possible to put an end to this most pernicious practice. Shooting for sport really does no harm at all. It makes very little difference—the ordinary sportsman going out with a 12 bore. It is this netting of hundreds and hundreds of birds, not only in the shooting season but throughout the breeding season, which creates more havoc than anything else among the wild life of India. I hope as a result of this Conference and as a result of legislation which has been introduced in some provinces and which I hope will be introduced universally throughout India, that something will be done, by controlling the commercialisation of wild life, to put an end to or mitigate the present deplorable amount of destruction which goes on. (Applause).

Mr. A. M. DAVID: Mr. Chairman and gentlemen, as you know, the Punjab has recently passed an Act called the Punjab Wild Animals and Wild Birds Protection Act. This Act came into force on the 15th September last year. As an instrument of legislation perhaps it is not perfect, but still it is a start, and I think every one will agree that it is a start in the right direction. I think I am right in saying that many of the anomalies that exist in the Act are the result of a slightly stormy passage through the Council. Briefly, the Act provides certain restrictions in regard to netting, shooting, snaring and selling. An important point about the Punjab Act is that any animal or bird which is not mentioned in the four Schedules is protected. As you will see in Schedule IV, provision has been made for keeping pets, and also for allowing *bona fide* collectors to collect animals for study or their own pursuits. Provision also exists to create sanctuaries, and section 13 gives ample powers for confiscation, levying of fees and future limitation with regard to any wild bird or wild animal. There are four types of licences. The first, is the shooting licence. It costs Rs. 5 and entitles the holder to shoot small game all over the province. If you pay Rs. 8 it entitles you to shoot small and big game all over the province, but excludes the Ooriyal and excludes the Kangra District, for which there is a special licence. And these licences of our contain a complete set of the rules. The second is for netting, snaring and noosing. This costs Rs. 20 and the activities of the holder are restricted to the district in which he is granted the licence. The third licence is the contractor's license, for which he pays Rs. 5, *i.e.*, a man cannot offer for sale to the public, dead or alive, birds, unless he is in possession of one of these licences. And here again, he is restricted to the district in which the licence is granted. In addition he has to keep a register showing the date, the kind of bird, from where it was caught and the licence number of the man from whom he purchased it. He is not allowed to buy birds from any one but a licence holder. In addition we have a licence—not a special one but obtained by altering the first—for hunting with dogs and hawks. Unfortunately the fee remains the same. Rs. 5. There was a proposal to charge so much per dog, but that was found to be impracticable, so we have a flat rate. A welcome provision of the Act is that it is now an offence to be in possession of a bird, dead or alive, in the close season. This I am afraid will come as a bit of a blow to the epicures in the various Clubs and hotels in the Punjab. who will now find it impossible to have partridge in June.

The fact that the bird came from Timbuctoo and has been in cold storage no longer counts. It is also illegal for railways and lorries to carry any game or bird out of season and during the season traffic in game is under control. I hope that the residents of Delhi very shortly will have a similar rule by which partridge will be taken off the menu in various hotels in June and July. The Chairman made a reference a little while ago to the conditions under which birds are kept and offered for sale. I would refer him to the Rules under the Punjab Act where it is an offence to have in possession a bird or animal which is badly damaged or wounded and the person concerned can be convicted. He has to destroy it. These are the general provisions. I think some of you who have studied the Act will realise that certain amendments are required; whether or not it will be possible to make these amendments, I do not know. The first one of course is in Schedule II, which says that you may shoot duck without a licence but you may not net them without a licence. I think ultimately these birds will have to be transferred from Schedule II to III, because on a good jheel eight guns can do just as much damage as a few netters. If a man in fact pays Rs. 5 to shoot the rest of the small game, it does not cost him any more to restrict his activities to the ducks as well. Whether the Act will work or not depends largely on whether the Council will decide to make the offences under the Act cognisable.

At present they are not. To get convictions we have to report the matter to the police who then lodge a complaint in the court of a magistrate not lower than that of a second class magistrate and we leave it at that and see what happens. The person who asks a man for his licence and finds he has not got one cannot do more than merely lodge a complaint to a police officer not below the rank of a Sub-Inspector. This is a direction in which I would make a change. I am making suggestions in case you wish. Sir, that other provinces might follow suit. We have provided in the Act 15 days grace in which to produce a licence. The loophole is obvious. If I go to the district and I ask A to show me his licence he says "I will produce it for you in 15 days," and if I let A go the chances are I will never see him again and I cannot possibly wait in the district for 15 days. The question of date is very important. If a man when asked on the 1st produces his licence on the 7th, it is obvious that he has taken it afterwards. The mere fact that he is given 15 days is a drawback. Then in each district in order to make the Act known and to work it, we have what are known as District Fauna Committees. They are presided over by the Deputy Commissioner or the Superintendent of Police and they are made up of 10, 15 or 20 members from the various Tehsils and their main mission at the moment is, if I may make the statement, to preach the gospel in the various distant parts of the district and get the Act known. We also have under consideration the printing of pamphlets, not word for word from the rules but in a more chatty form, which will ultimately be distributed.

Mr. SHEBBEARE: As you said, Sir, the main damage is done by sale of meat and game and I think every province should introduce an Act of its own on the lines of the Punjab Act, but I think we should at this Conference make out a sort of standard or model Act which provinces could change to suit their own circumstances. There are one or two respects in which the Punjab Act, for instance, would not altogether suit us. Killing, capture or possession is one thing and the buying, selling or

exposing for sale is another; these should be separated in my opinion, because the mere fact that you are allowed to kill at a certain season or under a licence *ipso facto* allows you to sell the same. As you yourself said, very little harm is done by sportsmen and I suppose the chief difference between a sportsman and what is not a sportsman really lies in the sale of meat. Anyhow most of the damage is done by the sale of meat. The other point that struck me was this. It might be necessary to preserve things other than what the Punjab Act calls animals and birds. Animals are defined as meaning mammals. That leaves out Monitor Lizard and pythons which should in certain districts be protected. That is a minor detail. The offences under the Act would have to be cognisable in order to make it really effective. I believe everyone in this room will agree to recommend the stopping of all sale. I do not suppose any of us have any particular sympathies with the sale of wild animals, dead, alive, or parts thereof. But we should naturally leave room to Local Governments to make such exceptions as they like but I believe those exceptions need not be so extensive as to make the whole Act useless. It would still prevent in certain districts the enormous slaughter that is going on for the market. Personally, I do not see that there is any hardship in barring all sale in the open market. Of course I quite see that minor offences against this Act will be practically impossible to stop, especially where a sale is represented as a gift. Naturally we could not stop all that, but it would be most useful to stop those little collections of men round the outskirts of jungle bazaars who are the offenders. All we can do at present is to inform the police who are not really interested because they can do nothing. If we make it a cognisable offence to sell meat, the onus of proof would be on the man who is selling it and I think that should be our main point. In this question if we can really stop the sale, we will stop all the real harmful destruction of game. There is one question with reference to this, and that is making rhino horn contraband. My Government asked me to bring this up. The Government of India thought it was advisable for provinces to deal with this, though they sympathised with it and said it would be obviously desirable to have an All-India Act making the possession of any part of a rhino an offence. They say that this is a subject which will under the new constitution be entirely in the hands of Local Governments and for that reason I should very much like to get this Conference to recommend that all provinces should have a provision in their Act for certain things to be contraband. At the moment I was thinking of rhino horns and musk pods. It is quite possible that we might want to do what the Ceylon Government has done, that is to render monitor lizard contraband. That cannot be dealt with under any of the sections of the Punjab Act as it stands at present, but I think there should be some contraband clause—certain things which might be notified from time to time by the Local Government; the possession of them without a licence or without some sort of paper to say that you are allowed to have it should be an offence.

Mr. DAVID: I think section 4 of the Punjab Act covers everything.

Sir PETER CLUTTERBUCK: As regards the contraband clause, it would come under the Imperial Government, because the chief traffic in contraband is by post and post is an Imperial subject.

Mr. SHEBBEARE: Section 4 of the Punjab Act says: It shall not be lawful to kill or to capture or to possess, whether dead or alive, or to buy, sell or to offer for sale, any wild bird or animal, except in the

manner and to the extent hereinafter provided. It does not say "or parts thereof". It says the flesh and eggs of birds.

Mr. DAVID: It is covered by section 3(3).

Mr. CHAIRMAN: There is nothing about the skin of monitor lizard.

Mr. DONALD: Horns and skins are omitted. These are, later in the Act, allowed to be kept as trophies. The presumption is that it was intended to prohibit any of these. You can only keep them as trophies.

Mr. SHEBBEARE: It would be much better to have a contraband clause and specify "all parts thereof" in the main Act and then have a permissive clause for trophies. I think this will take us too long to do in Conference.

CHAIRMAN: Do you think a Sub-Committee can deal with this question?

Khan Sahib ALLAH BAKHSH: Personally, I consider that any committee appointed here would be unable to frame a model Act for the whole of India. Conditions vary from province to province very much. It would be very difficult to frame anything exhaustive. I think it would be better if this Conference simply suggests lines to the various provinces to draw up the rules keeping in view what has been done in other provinces, particularly in the Punjab, which is leading in this respect at the moment.

Mr. SHEBBEARE: I am afraid I disagree with that.

Mr. CANNING: Last year in the United Provinces a small Act was introduced to amend the Act for the preservation of wild birds and animals. It went before the Select Committee and *was a modest Bill*. All of us on the Select Committee felt that we have got the old Act, under which no action has ever been taken and I actually had people who complained about certain things being done and who did not know that powers existed under the old Act. There was no agency for it. District Magistrates frankly admitted that nothing was ever done. It did not seem proper to make a very complicated Act unless we could see some means whereby it was going to be put into effect. This is a matter which has been brought to my notice. One of the things that I was told was that it was no use to have legislation which you were not going to carry out. In the Select Committee I pressed very strongly that as regards trade in game and birds there should be a penalty attached to buying as also for selling but that was left out in the Legislative Council. The whole thing becomes inoperative. It has only just been passed into law. It is very nice so far as it goes but I am not very sure whether we can achieve anything, since it is no offence "to buy" under this Act. It is almost a form of class legislation, intended to down the humble man who sells but not the rich man who buys out of season. It is a very great mistake and entirely wrong.

One other point. I am here to represent the Tehri State and on this point they have said, "The sale, purchase and export of live or dead birds or wild animals or plumage or parts of such animals is a State monopoly and no one is permitted to export at the State Customs barrier except under a regular pass. Their export is very restricted and the State derives only a nominal revenue from this source. The Darbar will continue this source as experience has shown it is desirable, though in the nature of things it may be difficult to adopt elsewhere outside the State." That shows that the State has complete control. It may be a particularly

favourably placed but it is a very satisfactory state of affairs. As regards further legislation, I agree that the Punjab Act has gone farther than we have and I only hope that it will succeed and I look to the time when we shall follow it. I would like to know whether the Punjab have the agency to carry it all out. That is my doubt. If, I felt that we had the agency to carry out an Act of that nature, it would be an extremely valuable Act.

Mr. CHAIRMAN: I would first like to say that it seems to me that the only satisfactory way of carrying out any legislation of this sort is to start at the end where the birds and the animals are sold. It may be almost impossible to deal with the original seller who comes from somewhere at the back of beyond, but when you come to the question of the quantities of birds that are sold here in Delhi and in Lahore and in Simla, it should be quite easy to get hold of those people. You have only got to go to the market and you see the whole thing laid out. You can buy black partridges by the hundred. If some means could be taken to put an end to that traffic, you would *ipso facto* close down the trapping of these birds, because there would be no sale for them; and a few convictions of hotel keepers in Simla would give better value to us as gentlemen interested in the protection of game than anything else in the world.

Mr. DONALD: In this respect Sir, the Punjab has recently formed an Association with the avowed object of helping Government to enforce the Act. The first thing to be done is to enlist public opinion in our favour. Government, with the best will in the world, cannot protect birds and beasts. Once we have a fairly large Association and can do a good deal of propaganda, we shall have accomplished something. While touring through the Punjab I interviewed about 20 District Fauna Committees and spoke to a large number of zemindars in most of the districts, and found the latter were themselves averse to the netting and noosing which goes on on their lands. Very few zemindars net or noose birds and this form of poaching is a monopoly in the hands of some three sects, the Ods, Criminal tribes and some professional fishermen castes, and given the encouragement the zemindar, as a class, will help us to enforce the rules. There is one other point I should like to suggest, *viz.*,:—that this Conference should ask Government to circularise all magistrates not to look upon offences under the Act as petty. Certain Divisional Forest Officers in the Punjab have told me that they have given up trying to get convictions under game rules as fines of Re. 1 and the like, merely encourage the offenders to further efforts. We should ask Government to bring this matter to the notice of magistrates periodically.

Sir PETER CLUTTERBUCK: May I ask Mr. David as to whether when they were drawing up the Act they thought of putting in a clause for compounding offences.

Mr. DAVID: You can put it under the rules.

Sir PETER CLUTTERBUCK: Can't you get it in the Act?

Mr. DAVID: That is a different thing.

Sir PETER CLUTTERBUCK: Cannot the Divisional Forest Officers be made First Class Magistrates? Every Divisional Forest Officer in Kashmir is. They will not let off a serious offence with a fine of 8 annas. The advantage of the Divisional Forest Officer being a First Class Magistrate is that the appeal will go to somebody who realises the importance of such cases.

Mr. DAVID: I take it, Sir, that he would try cases mostly under the Forest Act?

Sir PETER CLUTTERBUCK: Such cases are tried under the Game Laws. I think it is a very important thing for Forest Officers to have such powers.

Mr. CHAIRMAN: Might I intervene and say that Divisional Forest Officers may be made Second Class Magistrates; they cannot be made First Class.

Mr. DONALD: Referring to the Punjab, there is a very small area under the control of the Forest Department. What is to happen to the areas outside the jurisdiction of the Forest Department?

Mr. CHAIRMAN: If Forest Officers were made Second Class Magistrates for the purposes of this Act, it would cover this.

(The Conference then adjourned till 11 A.M. on Tuesday the 29th January 1935.)

(on 29th January 1935.)

The Conference met at eleven of the Clock, Mr. Trevor in the Chair.

Mr. CHAIRMAN: Gentlemen, we will continue now with item No. 3—"Special legislation for the preservation of wild life (outside the Indian Forest Act) enacted in various provinces. What further steps are necessary in this respect?"

We started on this yesterday and the views of several members were put before you. Mr. David explained the Punjab Act which has lately been brought into being and certain modifications in that Act were discussed. I should like now to obtain the views of other provinces and organisations as to what legislation would be suitable for adoption to meet the case of the wild life outside reserved forests, especially, the stopping of the netting of wild birds for commercial purposes.

Major CORBETT: I would like to suggest, Sir, that the sale of game be prohibited. That, I think, will meet several other items that you have yet to discuss with regard to the limiting of the length of guns, etc., and will to a very great extent put a stop to poaching. I do not myself think that there is very great harm done in netting and do not see how we can possibly get sufficient people to prevent it. I think that if Government were to pass a rule, it could not be enforced, while if we decide to stop the sale of game, it is very easily controlled. Game is always sold in public places. I would suggest the stopping of the purchase and sale of game.

Mr. PRATER: Sir, as regards the Bombay Presidency, there is not a very extensive sale of animals in the areas controlled by the Forest Department but in Khandesh and the central districts of the Presidency there is a certain amount of sale going on. But the major part of the products of the trade is obtained outside forest areas and I think that one way of checking it would be to make dealers or sellers of game and animal products take out a licence for which they should have to pay a special fee—in this way they could be controlled.

The second thing would be to class every animal which has its habitual habitat in forests as a forest product. At present if an animal is found outside a forest area you have got to prove that it has been shot in a forest, but if you class every animal that habitually lives in forests as a forest product it would be much easier to detect offences and control the sale of these animals.

Mr. CHAIRMAN: May I intervene for a moment with the remark that it might be possible to do this in the case of certain animals but certainly not in the case of all animals. There are hundreds of deer, chital and nilgai that live in government forests, but there are many others that live outside.

Mr. PRATER: Black buck habitually live outside forest areas, the nilgai lives in open country, but the chital or even the sambhar is definitely a forest animal.

Mr. CHAIRMAN: But there are large areas outside reserved forests where chital abound.

Mr. PRATER: But if you classify chital as forest animals, you could give them a certain amount of protection. You could control it by making the seller take out a license. You have got to get at the seller—not so much the man who sells the animal but the man who has the contract with the hotel or restaurant; you have got to get at the places where you can most easily get at him, where game is bought and sold to the public. These people should be made to take out a license. My second suggestion is to class certain animals as forest products. But whatever legislation you might adopt no great results would be obtained, unless there is a definite agency to administer it in areas outside forests. At present presumably the control or the administration of the Indian Wild Bird and Animals Protection Act and the looking after it outside forest areas rests with the police but they have got so many other things to do that the Act is practically a dead letter and animals are killed in and out of season and it goes on because there is nobody to look after it. For the forest areas you fix the responsibility on the Forest Department. But for outside areas you have not fixed the responsibility on any particular agency. For instance, take the question of the Sind Ibex which is being exterminated in Sind. There the police put down a few guards. As a matter of retrenchment those guards were withdrawn and extensive poaching is going on. Unless you have some agency and unless you bring that area under the control of the Forest Department or definitely ask the police to look after it, things will continue as they are and these animals will be completely exterminated.

Mr CHAIRMAN: The protection of Sind Ibex, is a matter completely outside the Forest Department. The Forest Department has no organisation to deal with it. It is a matter with regard to which the Bombay Government will have to make their own arrangements.

Mr. PRATER: Exactly, Sir. But it is a question of making a particular agency responsible for it. If you are going to ask the police to do it something might be done. But as long as there is no definite agency for protecting wild life outside forest areas, the passing of legislation or the improvement of existing legislation will not be very effective because what will happen will be exactly what has happened in the case of the present Wild Birds and Animals Act. It will remain a dead letter.

Khan Sahib ALLAH BAKHSH: The question of absolute prohibition of game needs consideration from another point of view. It is no use our passing resolutions which would not be accepted by local Governments. Take for instance the case of the Punjab. There is a very large population whose ancestral occupation for ages has been catching game and making a living. I am not prepared to believe that any local Government would agree to accept a recommendation on those lines. And if any Government happens to agree to it, I am quite sure that the American liquor laws will be repeated in this country. It would therefore be much better if licences are issued to restrict the sale.

There is another question. There are a large number of people who make a living by catching fish and selling them or catching certain types of birds. I think, as far as these are concerned, it would be all right if their activities can be restricted by the issue of licenses as has been done in the Punjab. On the other hand, the sale of trophies should be absolutely prohibited because it is not the poor people who are concerned but the people who can afford to give it up and therefore this question needs dividing into two parts. One is small game, for which licences should be issued, and the other is big game where trophies are sold and large sums made,—the latter should be absolutely prohibited.

Major CORBETT: Sir, my object in putting that proposal before you was that it would apply to everybody alike, to the man who sells his trophy (we all of us see advertisements in the papers—Tiger skins for sale) and the man who catches a partridge and sells it—it would apply to everybody equally and I do not think there would be any objection in passing a resolution which would apply to everybody alike. With regard to prescriptive rights, I do not know that we are quite right in assuming that people who earn a certain amount of money that they need to live on from catching and selling birds, have any prescriptive rights in the game that they sell. I am not talking about the villager who snares one partridge or a peacock. I am talking about those who make it a commercial proposition. That was my reason for suggesting that it be prohibited, as it would apply to everybody alike.

Col. ROSS: One point in connection with this question of licences for dealers is that taxidermists should be included in any licensing system. My own experience is that a large number of taxidermists in this country are merely agents for trading in hides and horns. I am quite certain that a large number of them specially of the smaller kind make their living almost entirely by this trade. If you include taxidermists in the licensing scheme and call on them to keep a register as is done in the case of the Punjab with dealers I think you will be able to trace a large number of poaching gangs who make just as much money out of hides as they make out of meat.

Mr. SHEBBEARE: I do not think there will be any question of allowing the sale of trophies to taxidermists. It is one of the things that would definitely be barred. The last thing we want to do is to allow taxidermists to buy trophies. As regards the sale of wild animals or parts thereof, we should have to leave room for local Governments to legislate so as to prevent hardship, but, as was pointed out, it would be mainly jungly people who make a living. I do not think there would be any question of Government countenancing taxidermists buying skins or hides to sell.

Major CORBETT: I would like to ask, Sir, how this licensing system, if it is agreed upon, is going to work. How are you going to fix what the dealer should purchase and the amount that he should purchase.

Mr. CHAIRMAN: I think, you could control the business as the Punjab are trying to do.

Major CORBETT: There will always be a conflict of opinion about it. The dealer will think he should buy thousands, while you might think he should buy hundreds. Whereas if you prevent him buying it altogether it will be very much simpler and easier to control.

Mr. ROBINSON: I think if we proceed with the licensing system, we will make a start and will know to some extent what is being done in the way of sale of animal skins and trophies to taxidermists, or bird life to hotels and restaurants, etc. We would have some idea, and then later on we would know where to put the check, or what to stop. I think we might start with the licensing, and there would not be much opposition from places where it has been the custom, as Khan Sahib Allah Bakhsh said, for the tribes to go out to hunt as a means of livelihood, and there would not be so much trouble if we start with the licensing system. We could issue licences, and then later on put the brake on and bring pressure to bear on them and try and stop it altogether in the course of a few years. If we start with licensing it will be a good start both for the seller and the purchaser.

Mr. WIMBUSH: I think, Sir, there must be a great difference between the conditions in different parts of India. What I have had in mind in connection with this prohibition of the sale of meat has been in connection with big game and the idea would be to prohibit the man in the village, who is in the habit of bringing in a chital or a sambhar twice a week, from selling it. The question of birds is of very great consequence in southern India but what we would like is some sort of enactment that would enable the police or forest guard to keep a check on it, because it would automatically stop it. In southern India and many other parts of India we want to stop it, and in order to do that I think that it is most desirable to make it illegal all the year round and not only during the close season. My reason for this is that in the case of our game licences we deliberately do not have a close season for big game because we limit the shooting by only allowing each licence holder to shoot a limited number of heads and also by the size of the head and we realise that the greatest protection to the game is to have sportsmen in our forests.

Major REYNOLDS: As far as Delhi province is concerned, we have already drafted a Protection Act based on the lines of the Punjab Protection Act but we are not concerned so much with the shooting. There is very little shooting in the Delhi Province. The main question we are concerned with is the sale of game and the draft of the Act was sent to the Association for their comments. Our chief comment was that in the Punjab Act a five-rupee licence for the sale of game was nowhere near sufficient. Where you have a licence for a person to noose or net five head, a dealer will sell a thousand or five thousand of them. We suggested Rs. 100 for a licence for the seller of game and we thought nothing less than Rs. 50 should be put on. When it comes to a question of barring sale altogether, I am not quite certain how far this is practicable. Surely, any man has the right to the produce of his own land. I rather think the outcry would be too great if you stop it altogether, because a visitor to India would never be able to taste game. So I do not think it would be possible to prohibit the sale of game altogether but I think the licensing of the sale of game could be done far more extensively than it is at present.

Sir PETER CLUTTERBUCK: There is one point about the classification of wild animals. The present Indian Forest Act reads:—

"Forest produce" includes—

(*a*) the following whether found in, or brought from, a forest or not, etc.

(*b*) the following when found in, or brought from, a forest, etc."

At present, wild animals, and skins, tusks, horns, bones, etc., come under head (*b*). What Mr. Prater really suggests is that wild animals and skins, and so on, should be put under (*a*). If that is the intention, the Act will have to be altered.

Mr. CHAIRMAN: The Act says that wild animals and skins, tusks, horns, bones, silk, cocoons, honey, and wax, and all other parts of produce of animals, are forest produce when found in, or brought from, a forest. Mr. Prater would like them to be included under (*a*), that is to say, whether found in, or brought from a forest or not. I understand rhinoceros has now been included under (*a*) and has been made forest produce.

Mr. A. J. W. MILROY: I do not think Assam would agree to all wild animals coming under (*a*)—animals like pigs and so on.

Mr. PRATER: We can make certain exemptions, like pigs, wild dogs, etc.

Mr. DONALD: Pigs have already been excluded in the Punjab. They are not protected.

Mr. MILROY: The resolution might perhaps say: "such as are scheduled by Local Governments and birds".

Mr. E. S. HYDE: In my State, there are ritual feasts organised at times, and whole Parganas—30 or 40 villages—turn out and absolutely kill everything that comes into the net, which is spread out for about 5 square miles. You cannot prevent that by any system of licensing, because that is not commercial; it is semi-religious. In reserved forests, we can stop it; but outside these, in very large areas we cannot stop it at all. I do not see how I can stop it under any licensing system.

Mr. NICHOLSON: Major Reynolds referred to the right of a land owner to game on his land. I believe in India, all wild animals belong to the Crown, and therefore, no land owner can prevent any one going on to his land and shooting.

Mr. CHAIRMAN: He can turn him off for trespass.

Mr. NICHOLSON: Even if a civil suit is filed, probably no damages will be given at all. It may be quite possible and legal for the Government to enact that nobody can shoot animals found anywhere in the country, and nobody can sell any part of the animal or any trophies.

Mr. AKHTAR ALI KHAN: All these wild animals do heavy damage to crops. The cultivator has got to incur a lot of expenditure. I think he expects some sort of return for his expenses from the sale of trophies. Otherwise, it will be very hard on the average cultivator.

Mr. CHAIRMAN: I cannot agree with those views. A man who gets a licence for the protection of his crops pays no fees for it. He gets a licence in order to enable him to scare away birds and animals from his fields. He should not be allowed to make a business out of it and sell the meat he gets from scaring away birds from his crops.

Mr. AKHTAR ALI KHAN: I do not say that he should be allowed to carry on business in that. He does not go out for shooting. He must protect his own crops. He must invest money in purchasing arms and ammunition and the fire arms to be able to protect his crops. Naturally he thinks he is justified in selling the skins of the animals which have been shot in his fields in the protection of his own crops.

Mr. DONALD: Section 12 (1) of the Punjab Act just covers that. It runs:—

> "Nothing in this Act shall be deemed to apply to—
> (i) the killing or capture in good faith of any wild bird or wild animal by any person in defence of himself or of any other person or of property."

Two years ago I got all the figures for the licences issued in the Punjab, and I think I am right in saying that there were 43,000 crop protection licences and 40,000 shooting game licences. Out of these 43,000, so far as the Punjab is concerned, I think 40,000 were used for shooting as well as crop protection. That is what we want to stop.

Pirzada AMIR HASAN: We have not got any law in the States to protect these things, but the principle discussed so far—that it is a very effective means of controlling and preserving the wild animals—I think the States won't have any objection to consider it favourably and pass a law to that effect.

Mr. PRATER: As regards ownership of game on private land, my Society tried to obtain legal opinion, and while the ownership of the game rests with the Crown, the law as actually applied is the law of England where the ownership of game on private land vests in the owner of the land.

Mr. CHAIRMAN: The ownership of game on private land does not vest in anybody until that game is killed. That is the law of England.

Mr. PRATER: We are talking about the animal which is killed or captured.

Mr. CHAIRMAN: Once it is killed, the ownership vests in the owner of the land, but as long as the bird is flying in the air, ownership rests with nobody.

Mr. PRATER: We have been talking of the sale of an animal that has been killed.

Major CORBETT: A man got a licence for crop protection, and to my certain knowledge, during the months of April and May, within half a mile of my own holding, he shot 60 heads of Sambhur and Chital which he sold in a nearby bazaar.

Mr. CHAIRMAN: There is one point that has not been mentioned yet. A man who gets a crop protection licence at present seems to be under the impression that he can go and use his gun anywhere. Surely, if a licence is issued merely for the protection of the man's crops, he should only be allowed to use that gun in the area in his own possession. Why should he be allowed to use that gun anywhere else? He is given a licence free of charge for protecting his 5 bighas of land. Why should he be allowed to wander about the country outside his 5 bighas, carrying his gun, and shooting whatever comes in his way? It seems to me unreasonable.

Mr. SHEBBEARE: In the licence Form 19, there is a column—"area for which the licence is given". What we really want is to ask Local Governments to instruct their licensing officers to fill that column up. It is filled up in Bengal. It should be filled up either for his holding or for his village.

Col. ROSS: I consider that, in any resolution we may pass, the basic principle should be that licences must be granted on such condition as will place on the licensee the burden of proof that game in his possession was obtained legally.

Mr. CHAIRMAN: I think that is provided in the Punjab Act.

Mr. DAVID: With regard to the second half of the agenda, I should like to say that in any future Act which is enacted, all these offences must be made cognizable.

Khan Bahadur NABI BAKSH MOHD HUSSAIN: I think the discussion is proceeding on wrong lines. We have to distinguish between three classes of game. One is game of wild animals which require absolute protection. For this, prohibition of sale of any part is necessary; the second is game of wild animals which require partial protection; for this, action on the lines of the Punjab Act is necessary. The third is game which does not require any protection. For this, no action is necessary. Local Governments should be requested to legislate on these lines. Game which has to be protected should not be allowed to be sold anywhere. Game which requires partial protection should be licensed, and game which does not require any protection should be left unprotected.

Mr. CHAIRMAN: That is a detail which should be left to Local Governments when they introduce the necessary legislation.

Mr. SHEBBEARE: The point just now raised brings in the question of differentiating between killing and possession. The prevention of sale is a fairly sweeping measure and we should have a tremendous lot of sympathy behind us in recommending the prevention of buying or selling or offering for sale. We approve of the killing; but we do not approve of the sale of everything that is killed.

Just one other point, which interests Bengal, and which my Government asked me to bring up, *i.e.*, the question of inserting in the necessary legislation some clause which would permit Local Governments to make certain animals absolutely contraband. It would be a clause to permit them to make absolutely contraband in the case of animals which are absolutely protected. It would help us very greatly. The Rhino is what I am thinking of. The same would apply to lion skins or wild Asses from Sind, etc. If you possess them after a certain date, you will have to show where you got them.

Mr. CANNING: Do we come anywhere to the question of shooting from motor cars or limiting the use of artificial lights?

Mr. CHAIRMAN: It can come under this head.

Mr. CANNING: In that case, it would be good if we hear the views of people on this subject. I think myself that shooting from motor cars in reserved forests should certainly be prohibited. I admit it is a question of difficult detail to define what is shooting from a motor car and what is not. Still, I do not think we ought to be put off on account of that difficulty. Whether it is possible to extend that legislation to outside

reserved forests is a matter on which other people would no doubt have views. That would be very much more difficult certainly. The other point is about the use of artificial light. I believe we are the only province in which the use of artificial light in shooting is absolutely prohibited. The African Convention has absolutely prohibited it throughout Africa. I recommend that the prohibition should be extended to India.

Mr. WIMBUSH: I think this question of shooting from motor cars, or even from a specified distance from motor cars, is the most important of all questions in certain parts of the country, and especially in Madras. There is one point that makes the problem very difficult, and that is, in the case of a good many reserved forests, the main roads go through the forests and the surface of the roads is not reserved forest. The result is that although this is prohibited under our Forest Rules in the reserved forests, yet, whenever there is a road the surface of which is not reserved forest it becomes impossible to enforce the rule. I think that it is highly desirable to prohibit all shooting from a motor car, or from within a 100 yards of a motor car. It will never do to prohibit all shooting from roads, because, as we know, many forest roads near our games are very fine places for an evening stroll. You must bring in the word "motor car" and a certain distance from a motor car. I do not see why that should not be prohibited generally and everywhere.

Mr. CHAIRMAN: In England, shooting from the public highways is prohibited and is an offence. I daresay some of you have observed that there are a number of cases in India of some unfortunate man being shot dead by somebody in a motor car who thought it was a bear or some other wild animal. I think that all shooting from motor cars on the public highway, whether inside reserved forests or not, should be prohibited. There is no reason at all why anybody in this country, or in any other civilised country, should be allowed to carry a rifle in a motor car and go along a public highway and loose it off on anything he thinks is an animal. As regards Mr. Wimbush's point regarding forest roads, I cannot see any reason why we should not urge upon Government, to prohibit the use of fire arms on a public highway, in addition to shooting from a motor car. I think both should be done.

Mr. CHAMPION: I would like to say, instead of motor car, any wheeled vehicle.

Mr. CHAIRMAN: I should like to have the views of the Conference on the point I put forward about shooting on the public highway.

Mr. WHITEHEAD: I think a right of way exists over many of our forest roads and such roads will presumably be regarded as public highways.

Mr. WIMBUSH: As regards shooting from roads, the doing of any act which causes danger, obstruction or injury to any person in any public way is an offence by virtue of section 283 of the Indian Penal Code. This is a comprehensive section.

Mr. CHAIRMAN: He is only liable to be charged in the case of damage.

Mr. DONALD: I would restrict shooting from a motor car anywhere, not only on high roads.

Mr. CANNING: We have already in the United Provinces the restriction operting between sunset and sunrise, and we feel the necessity of extending it between sunrise and sunset. This restriction applies only to reserved forests. We want it everywhere.

Mr. JIWAN SINGH: We have strict legislation, but unless that is backed up by public opinion it cannot be effective. I think animals requiring protection should be included in Schedules attached to legislation, while those destructive to crops or dangerous to man should be left out of the Schedules. That will make public opinion favour the legislation.

Rai Sahib Lala GOPAL DAS: Shooting from motor cars is a great menace to wild life. Up to recently people could be seen going out in a motor car for an hour or two and coming back with a dozen partridge and a buck or two. This is simply butchery and legislation prohibiting shooting from motor cars would be welcomed by everybody. In Hissar I was invited by a very famous Civil Surgeon to go with him in his car, and with that he chased deer round till they were exhausted and shot 11 of them. It was nothing short of butchery and I was horrified that such a practice should be indulged in by a Government official. I therefore strongly support the proposal that shooting from motor cars anywhere, on the high road or not, should be prohibited altogether.

Mr. SHEBBEARE: I don't see much harm in shooting leopard one meets at night sometimes. I should say that is a legitimate form of sport.

Mr. WIMBUSH: The difficulty would be to differentiate. A man with a rifle sticking out of his car could always say he was looking for leopard.

Mr. CHAMPION: Three times recently I have met a leopard and stopped the car and the leopard has sat down by the side of the road. Nobody pretending to be a sportsman could shoot it. If you want to destroy leopard you might as well put down strychnine.

Mr. DONALD: We have exempted leopards from the provisions of the Act and they can be shot anywhere at any time; so their shooting from a car is no crime.

Mr. CHAIRMAN: Gentlemen, I think we have discussed this point enough. I propose to ask Mr. Shebbeare to get one or two members of this Conference to elaborate what I have written down as the sense of the Conference. This is what I have roughly drafted:—

"In view of the discussions this morning the Conference was of opinion that the only effective way of preventing undue destruction of wild birds and animals outside forest areas was by the restriction, limitation or prohibition of the sale or purchase of such birds and animals, whether dead or alive, or any part of them.

2. The Conference welcomes recent legislation enacted in the Punjab under the Punjab Wild Birds and Animals Protection Act, but is of the opinion that unless offences under this Act are made cognizable its enforcement will be rendered very difficult.

3. The Conference was further of the opinion that legislation on similar lines might advantageously be introduced in other provinces.

4. In any legislation for the preservation of wild life, it is important to differentiate between killing, capturing or possessing on the one hand, and buying, selling and offering for sale on the other, that any licence system should be made to include taxidermists, that in certain cases, as in the case of the Sind Ibex, a special agency, must be provided for the protection of such animals; that certain animals and birds scheduled by Government should be brought under the definition of forest produce in section 2(4)(a) instead of section 2(4)(b) of the Indian Forest Act; that in

the case of specially protected animals powers should be taken to make the possession of such animals or parts thereof absolute contraband.

5. That all shooting from wheeled vehicles should be prohibited everywhere."

(Suggestions were made to include chasing, hunting or shooting within a certain distance, and the Chairman amended the proposed clause to read—).

5. "That all shooting, chasing or hunting from a wheeled vehicle or shooting from within 100 yards of such a vehicle should be prohibited everywhere."

Mr. PHUKAN: I should like to protest against clause 5 so far as Assam is concerned. We are liable to meet a man-eater or an elephant on the road and we must shoot in self-defence. I would limit it to game to be preserved.

Sir PETER CLUTTERBUCK: With regard to clause 2, would it not be possible to put in the power to compound also? It is often difficult to take petty cases long distances to courts in order to prosecute.

Mr. DAVID: I would agree to that provided power to compound is not given to subordinates.

Mr. CHAMPION: The question of artificial lights has not been quite settled.

Mr. CHAIRMAN: Well, what is the view of the Conference on artificial light shooting?

Several Members: Absolute prohibition.

Mr. PHUKAN: I think it ought to be left to Local Governments. They may not find it necessary, just as they may not think shooting from motor cars as objectionable. So far as Assam is concerned I don't think anybody will agree to the suggestion. If Local Governments think it necessary elsewhere they can introduce these prohibitions.

Mr. CHAIRMAN: We are not binding the Local Governments. All that we are doing is to recommend. I think it is the general sense of this meeting and of world opinion that shooting with artificial lights does not give animals a fair chance. To fit up a battery of electric lights over a kill and at the critical moment switch on flood lighting is hardly sport. So far as a man-eater is concerned, he is to be killed anyhow and anywhere. In any case, in special cases, in Assam for instance, tigers and other dangerous game would presumably be excluded from such a provision in any legislation which may be enacted locally.

Mr. DONALD: In regard to deer and antelope we have already rules that no shooting is permitted between sunset and sunrise.

Mr. CHAMPION: But that rule is defeated by people shooting a few minutes after sunset and before sunrise. That is the dangerous time.

Mr. NICHOLSON: I suggest that the rules be amended so as not to refer to animals proscribed by the Local Governments.

Mr. CANNING: I think there are bound to be differences and exceptions in this matter, but surely what we want to arrive at is a consensus of opinion as to whether we do or do not favour shooting with artificial light. Undoubtedly local administrations will have to make exceptions. For instance in certain parts in the United Provinces tiger and panther

have so little game to feed on that they tend to become man-eaters and we allow their destruction more or less as vermin; that is in the higher parts of Kumaon. Conditions are not consistent even throughout our province. But what we want to arrive at is something we can agree to as a convention, as the sense of this Conference, to support us in putting our proposals before the Local Governments and local Councils.

Mr. BOLAM: No emphasis has been laid at all on the rather objectionable practice of shooting over water.

Mr. SHEBBEARE: I think that again will have to be left to Local Governments because conditions vary so much. Local Governments could legislate for these varying conditions.

Mr. CHAMPION: Could the question of fish be considered in No. 3—the netting of fish. I understand that in the Punjab also the position is very bad.

Dr. BAINI PRASHAD: In Bengal it is very much worse. There is a special type of fishing in certain areas just before the rains when the water is very low. Of course it is then confined to pools and recesses. When the rains come and the fields are flooded, the fish spread over a large area, and it is about then that they are breeding before the water begins to recede. What the people do is to dig pits in the field 10 to 15 yards in diameter and about 10 feet deep, and as the water recedes the fish get concentrated in these deep pits, and I have myself seen in Khulna and Backergunj these pits consisting of nothing but a mass of fish. These are baled out in large quantities after the water has receded. In the same way streams are netted by diverting the main channel. These methods are disastrous for the fish and it would be valuable to have something included about this.

Mr. DONALD: In the Punjab we have definite rules under the Fisheries Rules that no fishing of any sort or kind is allowed during the spawning season. I do not think netting does very much damage. You cannot stop it. It is the livelihood of the people and if you prescribe a minimum meshing—we have 1¼ inches—I do not think very much damage is done. But there used to be a great deal of damage done, as Dr. Baini Prashad has pointed out, during the spawning season when fish leave the rivers and spawn in the fields. In many cases, carp, for instance, go off as much as a mile away from the river and spawn in the fields, and in such cases thousands and thousands used to be caught. Under the present Act it is now prohibited and so far as legislation goes we are safe, but the difficulty is to carry out the legislation.

Dr. BAINI PRASHAD: We have no legislation in Bengal and Assam, and I think that even where there is legislation it is not enforced. That is what I want to bring out, that the condition in this respect is deplorable. Then Mr. Donald said fishing is not allowed during the spawning season. I may mention the case of that famous fish, the Hilsa, one of the most edible fishes of Bengal. In the parts where it is found all the fishing is done during the spawning season, because it is then at its best for human consumption. In fact none or very little fishing is done for it after the rains.

Still a large number of these are caught, but the major part of the fish is caught during the spawning season, because that is the time when really the fish is worth eating.

Mr. DONALD: Hilsa used to be fairly common 25 or 30 years ago in many parts of the Punjab and it used to come up as far as Ferozpur, but now for the last 10 years there has been two reports of Hilsa at Dera Gazi Khan and now there is not a single report of any Hilsa in the Punjab. That bears out what Dr. Baini Prashad has said.

Col. ROSS: In certain streams we lease fishing rights from land owners and we find that any land owner who owns both banks of a river can prevent fish running up if he wants to do so. One man who owns hundred yards of both banks can prevent access of fish into the whole upper waters, and the only way we can prevent it is by paying enormous amounts in rent.

Dr. BAINI PRASHAD: The Inspector-General of Fisheries in 1875 made suggestions for stopping fish from going up rivers. Various suggestions were made some of which were embodied in the Fishing Acts at the time in force. It was considered unfair that the rights of land owners should be interfered with. But no definite ideas have been formulated in connection with this.

Mr. CHAIRMAN: I think we might include fish under item No. 3, and we must get on to consider Item No. 4. There is a good deal of literature in the proceedings on this item and apparently most Local Governments are quite prepared to accept the recommendation to the effect that the barrels of guns allowed for crop protection should be limited in length. Mysore say that it is desirable to adopt measures for restricting the possession and use of weapons which may be used for poaching. They agree that the barrels of guns used for the protection of crops should be cut down to 12" or below. As far as I remember several other Local Governments were also in favour of this.

Mr. CANNING: I have no instructions in the matter and I have no particular views. There is, I imagine, a certain amount of difference of opinion. I think you must consider the cultivator. There are places I know adjoining our forests in the more inhabited tracts where I do not think I should want to enforce the same rule as I would in other places. There the head of game that comes out nightly from the forests into the fields is such that if I had to sit up night after night watching a field I should be very sorry if all I could do was to make a noise to frighten the animal away. We must not propose something that cannot be entirely adopted everywhere.

Mr. MILROY: A recent Committee of the House of Commons has recommended that gun barrels below 24" in length should not be allowed in England, because such guns are easily concealed by people. I do not know what the police officials think about it.

Mr. BOLAM: I quite agree with that.

Major CORBETT: With regard to the cutting down of the barrel, Sir. Mr. Canning said it was a case of just letting off a gun to make a noise. I do not know if any of the members have any experience of firing a gun with a barrel of 12" or 18". It was in 1905 or 1907 that all our crop protection guns were cut down—the barrels were cut down.

I have recently been speaking to people who were using the guns at that time and they tell me that for crop protection they are quite all right. It is quite effective if the barrel is cut down to 12 or 18 inches. There is one thing that I would like to say in that connection. In the olden days we used to have all muzzle loaders for crop protection and they were all single barrel muzzle loaders. Within recent years Government have allowed people licences for double barrel breech loaders. It is with these guns that all the damage in the forest is today being done. If you load a muzzle loader with shot when you leave your house you invariably come across animals which you could not shoot. If on the other hand you load it with ball, you come across birds which you could not shoot. With a breach loader, you can change the shot or ball at a moment's notice and you can certainly do a hundred times the amount of shooting in a jungle with a breech loader than you can with a muzzle loader. I would like to say one word with regard to cutting down the weapons. Personally I have licences for three crop protection guns. Those guns are old and are valued trophies and I do not think I would concede anybody the right of cutting down the thing that I had myself purchased and that I looked after. That would be the feeling with everybody. If the guns were cut down to 18 inches there would be good reason for people to complain about the recommendations made by us, but I think that any crop protection licence ought only to be given for muzzle loaders and for single barrel muzzle loaders. There is another weapon which does a very great deal of damage in our forests and that is the weapon that is held under a different licence. That licence is for life and property protection. (Jan Mal it is called.) People holding these licences acquire a small bit of land in a village and because of their holding there they use the gun or rifle all round about the village and they are the ones who do really most of the damage. I would like if possible that licence to be cancelled and just one licence for crop protection to stand. There should only be a licence for crop protection and that licence should be given on a man's holding and in no case should any of these crop protection licences be for breech loaders.

Mr. DONALD: There is one slight objection to Major Corbett's proposal and that is that if you definitely rule that crop protection licences shall be muzzle loaders, in the Punjab up in the hills you have got bears to deal with. A man fires and if a bear charges it will be impossible to deal with the situation. Government will be blamed for permitting only muzzle loaders. That is the only objection. If you can scare away the animals without wounding or killing them outright, well and good.

Mr. CANNING: Could we possibly arrive at what we aim by making licence for short barrel muzzle loaders very much cheaper than what it would be for a breech loader?

Mr. CHAIRMAN: Crop licence is free.

Mr. CANNING: It may be made rather expensive to have a gun licence for the protection of crops if it is required for a breech loader.

Major CORBETT: That will not serve the purpose as the man concerned will make Rs. 5 and Rs. 10 per head. It would not matter to him what the licence fee was because he could very well recover it from the game he shoots.

Sir PETER CLUTTERBUCK: As regards the question of bears in the hills, there would have to be some sort of exemption in such cases. Villagers in some parts of the Himalayas could not possibly live without arming themselves against bears.

Mr. SHEBBEARE: I agree with what Mr. Canning has said. As regards the point raised by Major Corbett about these treasured weapons, I do not think these should be licenced for the protection of crops; I think these should be licensed for display or for sport. There is a very important point which has been raised by Major Corbett and that is about the area for which guns are licensed for the protection of crops. The area must be prescribed in which they will be valid. In Bengal most of the guns for protection of crops are free and the law has not always been strictly enforced, with the result that there are people with breech loaders who are poaching with weapons which are licensed for the protection of their crops. At a recent Commissioners' Conference, the following resolution was passed:—

"In thanas adjoining reserved forests, the Forest Department and the local Shooting Club, where such exists, should be consulted as well as the Police before any licence is issued.

Licences for sport should be issued only to *bona fide* sportsmen, who ordinarily will be expected to take out a permit to shoot in the area in which they reside when such area contains shooting grounds.

Licences for self-protection or crop protection should be subject to the following restrictions:—

(*a*) Only shot guns shall be allowed (not sporting rifles).

(*b*) The barrels should be cut down to 12" in length, measuring from the breech in breech-loading weapons and from the base of the firing chamber in muzzle loaders.

(*c*) Watchmen's machans should not be erected within 400 yards of the forest boundary.

(*d*) Licences for retainers should be restricted to persons of exceptional position.

(*e*) Forest Department should keep a check on caps and gunpowder issued to forest villagers for protection of crops.

(*f*) The carrying of bows and arrows within the limits of Reserved Forests shall be made illegal.

(*g*) Game nets should be prohibited within three miles of the Reserved Forest,"

I think what we might recommend is this. Local Governments should lay down areas in which the length of barrels licensed for the protection of crops may be limited and they should restrict the erection of machans within such proximity to areas where wild life is protected as may appear

desirable. We have a good many cases of machans for the protection of crops with salt put in front of them. They should also prohibit the possession of game nets in such areas. That is all I have to say.

Mr. CHAIRMAN: I think several speakers raised the point about entering on the licences the specified area for which the crop protection licence was valid. Is it the general view of the meeting that we should adopt the suggestions made by Mr. Shebbeare regarding the limitation of the length of the muzzle of the crop protection guns?

Mr. RABINDRA NATH BHANDARI: Spears are used instead of guns for crop protection. How can we limit them?

Mr. PHUKAN: I am against limiting the length of the barrels. In Assam it is definitely prescribed within what limits a licensee can use his gun. Very strict rules are enforced and very limited areas are prescribed. It is no good merely firing and making a noise unless you can kill the animal or effectively frighten him. People in Assam will resent very much if the length of the barrels is limited. How are you going to cut the barrels of the guns belonging to people who have already invested money in them? To limit the barrel would be very difficult. New companies will have to spring up to build new short barrelled guns. It would not work so far as Assam is concerned. If you merely restrict the area and keep strict vigilance, I think it would be sufficient.

Mr. CHAIRMAN: Are you quite prepared to accept the statement that only muzzle loading guns should be allowed free for crop protection purposes?

Kunwar BAM BAHADUR SHAH: Muzzle-loading guns should not be cut. I come from a district which is on the frontier of Nepal and our experience is that short barrel is no use for driving wild pigs or blue bulls. For 6 or 7 days they leave the field and afterwards they want to be the masters of the situation. That is my practical experience. We have got long barrel muzzle loading guns. Perhaps Mr. Canning, who is our Chief Conservator will take proper care to see that there is no poaching. It is useless asking the cultivators to protect their fields with cut down barrels.

Mr. CANNING: The remarks of Kunwar Bam Bahadur Shah are particularly worthy of consideration. He is very modest about what his estate has done. It has really a first class swamp deer preserve and his estate is setting an extremely good example to all provinces in game preservation and also of having good crops in spite of these difficulties.

Mr SRIHARAN BIRBAR DURGA CHARAN PATNAIK: I come from one of the Wetern States and the villages there are in the forest or near it. There is a lot of wild game. Our people get licences not only for protecting the crops but for their self-protection. Under such circumstances while they move in the forest they often see carnivorous animals. Our people have got mostly muzzle loaded guns. Under such circumstances, the States perhaps will not like the idea of cutting down the size of guns or limiting them.

Mr. CHAIRMAN: Gentlemen, I have noted down here the general results of our discussion on item 4.

The Conference supports the suggestion that all free gun licences for the protection of crops should be restricted to single-barrelled smooth bore guns.

That in Permit No. 16, which is the ordinary gun licence which is issued for sport, protection or display, particulars should be specified.

That permits for sport should be given to *bona-fide* sportsmen whose status is such as to warrant such a licence. Now that is a matter which we might discuss. Is it reasonable to issue a licence for sport to a person who is really not the least likely to use it for sport? Should there be any discrimination on the part of the district magistrate in issuing licences that have been applied for sport? I should like to hear some of the opinions of the unofficial members here on that point.

Mr. DONALD: In the Punjab, Sir, we have got under our rules that nobody can have a shooting licence unless he has got a licence for sport.

MR. SHEBBEARE: Sir, an objection was raised to that by some people in Bengal who said that they never shoot in the forest and only want to shoot snipe; why should they join a shooting club. People who shoot snipe and duck never go near a forest and the only protection the club can give is in a reserved forest.

Mr. CHAIRMAN: But this does not necessarily apply to reserved forests. Lots of people shoot but never go inside a reserved forest, for instance in the Punjab.

Mr. SHEBBEARE: I do not know if there is a licence for sport for the whole of the Punjab. We have no such thing in Bengal, but I think it would be an excellent thing to introduce.

Mr. WIMBUSH: I think it is worth considering whether, in the case of people who want to shoot in reserved forests and who are going after big game, the magistracy would be justified in asking what type of weapon they have got and whether they have only got a gun. I think it might be difficult but they would probably say they are going to use a lethal bullet in their shot gun.

Mr. CHAIRMAN: Is it the general view of the Conference that we should make a recommendation.

> "That permits for sport should be given to *bona fide* sportsmen whose status is such as to warrant such a licence."

I am always getting applications from clerks and subordinates for licences, but I think that it is unreasonable that a subordinate on Rs. 2G a month should be given a licence for sport. He cannot afford to buy cartridges in any case and in most cases the gun is used either for no particular purpose or it gets into bad hands.

Another item I have noted down from the recommendations of the Bengal Commissioners' Conference, is—

> That in thanas near forests, the forest officer and local shooting club, if any, should be consulted before new licences for sport are granted.

Mr. WIMBUSH: Yes, that is most desirable.

Mr. CHAIRMAN: Another item is that retainers' licence, if allowed at all, should be strictly limited. I think there is a very great deal of abuse in connection with retainers.

Now I come to the question about the area over which a crop protection licence should be valid and I have mentioned here that the licence in form 19 which is the crop protection licence should be limited in number and the area over which the licence is valid should be specified. I do not think anybody can have a grave objection to that. The area should be the village boundary.

Mr. SHEBBEARE: May I say one thing? Selected forest and police officers should be allowed to call on holders of gun licences for crop protection to produce their guns at any time. Under the Arms Act I think this is illegal. But I will look it up and make sure. You can search a man's house for a gun, once a year. But what we want is to be allowed to call on the holder of a gun to produce that gun any time, because we often get *khubber* that the gun has been taken off for shooting purposes.

Major CORBETT: I would like to ask what you mean by "selected".

Mr. SHEBBEARE: I think the idea is that they should be selected as people who would not be likely to use it for harrying holders of licences but more or less respectable people. All forest officers are respectable people, but we could select a ranger who may be trusted to do the work without harassment. The selection could be done by the local forest men, but it should be by name and not as holding office.

Major CORBETT: Sir, in connection with the gun licence generally, the question has not been raised about the ammunition.

Mr. CHAIRMAN: I am coming to that now.

"Ammunition for licences for protection or display should be strictly limited."

At present on the gun licence there is a column for the amount of ammunition allowed and it is generally left blank.

Mr. SHEBBEARE: There is a point about that Sir. For shot-gun ammunition there is no limit to the amount which may be purchased during the year and the amount purchased is not always entered on the licence. If you write to a gun-smith for shot-gun cartridges, and if he has the number of your licence, he can supply them and the police do not necessarily make any inquiries. Unfortunately shot-gun ammunition includes lethal bullets so that it is important that all ammunition should be entered on the licence.

Major CORBETT: Sir, when a licence is given it is specified that with an ordinary licence there shall be allowed 200 rounds of ammunition. Now that means that a man is not at any particular time to possess more than 200 rounds, but, can buy 200 rounds every day. There ought I think to be a limit per licence per year.

Mr. CANNING: In the United Provinces, the number of shot cartridges entered is reported to the police and they check every one.

Rai Sahib GOPAL DAS: In the Punjab the practice is that no limit is imposed on the cartridges. As far as the police are concerned, it is also definitely mentioned that one cannot buy more than 25 bullets at a time. This is one drawback.

Mr. CHAIRMAN: I think if we say "Ammunition for licence for protection or display should be strictly limited and entered on the licence" we could leave it to the Local Governments to fix an annual limit or deal with the matter in any way they like.

Mr. SHEBBEARE: Sir, I do not think that this entering on the licence was meant to refer only to guns for display or protection. I think that was meant to refer to all ammunition for all gun licences.

Mr. CHAIRMAN: What is the general view of the Conference regarding ammunition in the case of licences for sport. I must say I agree with Mr. Shebbeare's point of view.

Mr. SHEBBEARE: You are already limited for bullet cartridges as to the number you may buy at one time but that does not worry anybody. Unfortunately, shot gun cartridges have been interpreted as cartridges for shot guns and that includes lethal bullets.

Mr. CHAIRMAN: Well then, you must get hold of your Government because we have heard that it is not so in the Punjab.

Now about entering the number of purchases made by the dealer. You say it is not done in Bengal.

Mr. SHEBBEARE: It is not done in the case of shot gun ammunition. Or rather I will be still more cautious and say it is not always done in Bengal. It is issued and is perfectly legal without being entered on the licence.

Mr. BOLAM: The number is entered on the licence in the United Provinces.

Mr. CHAIRMAN: Well, is this Conference prepared to recommend that the quantity of ammunition purchased should be entered on gun licences? I think it is done everywhere except in Bengal.

Mr. CANNING: The amount is set down in the United Provinces but I do not think it is in the licence form. I think it would be helpful if it is present in the licence form. It is rather a nuisance if you want to find out the number of cartridges a man has bought to go to the trouble of inquiring from the police. If it is always entered on the licence no one would have any objection to it and a man who buys some in Bengal, some in Bombay and elsewhere, would have it all set down.

Mr. CHAIRMAN: Well, you cannot buy cartridges unless you produce your licence.

Mr. CANNING: But they do not enter on the licence form the number you have obtained during the year.

Mr. CHAIRMAN: It certainly is of value to know that A. has bought a thousand cartridges.

Mr. SHEBBEARE: The importance of this was brought out in a case in Assam, where a man got enormous numbers of cartridges. We had a case exactly like that in Bengal where a man had a licence and supplied all the unlicensed guns all round him. If it had been entered on the licence he would have had to give some kind of explanation.

Mr. CHAIRMAN: The next point is that section 18 of the Indian Arms Act should be amended so as to allow of the cancellation of the licence on conviction of the breach of the game laws. At present there is no provision in the Indian Arms Act where a licence can be cancelled on conviction of a

breach of the game laws. The licence can be cancelled on conviction for breach of the Arms Act but not in the case of a man convicted for poaching.

It would be better to leave it at this—"to allow of the cancellation of a licence on conviction of a breach of the game laws." That is permissive and presumably would be done. The Forest Officer or the Police Officer who prosecutes would demand cancellation of the licence in dealing with the case. He might get it cancelled or he may not.

Mr. DONALD: As far as the Punjab is concerned, the law that we have just enacted definitely lays down that the game licence would not be issued to him, or that it would be cancelled. If that licence is cancelled, the man cannot go out to shoot. He is automatically debarred from shooting any further game.

Mr. CHAIRMAN: Your Act is a local Act. It does not apply elsewhere. If they include all these things in the local Act, we shall have done our duty.

Mr. NICHOLSON: We cannot confiscate the gun licence.

Mr. CHAIRMAN: We propose that Section 18 of the Indian Arms Act should be amended so as to allow of the cancellation of a licence on conviction of a breach of the game laws. It is a legal point whether for a breach of a local Act, you can punish him under an All-India Act.

Mr. SHEBBEARE: We suggest an amendment of the All-India Act.

Mr. T. R. PHUKAN: I think that can be done very easily.

Mr. NICHOLSON: It will be equally satisfactory if licences were not renewed.

Mr. SHEBBEARE: At present our difficulty is this. When we go up with a poaching case, we ask the District Magistrate for the man's licence to be cancelled, and the District Magistrate quite rightly says, "It is not in the Arms Act. There is no breach of the peace. He merely killed a deer. What I can do is not to renew the licence." So, I make a note of it, and subsequently write to his successor, "Your predecessor told me to come up for the non-renewal of this licence" and I may get a reply or I may not.

Mr. CHAIRMAN: I think we might leave it to the Law Officers of the Crown to worry themselves out in due course.

We will now discuss (*b*)—"to limit the use of such arms to certain seasons."

Mr. WHITEHEAD: In the Central Provinces it is proposed to call in all guns held under crop protection licences after crops have been harvested. The damage to game is principally done by holders of crop protection licences, not only in the legitimate protection of their crops but also by poaching in the forests. Most of the poaching is done in the hot weather when there are no crops to protect, and it is proposed to call in the guns as soon as crops have been harvested. This was formerly done in the Central Provinces and it is now proposed to re-introduce the practice. In our forest villages the practice is now in force.

Mr. T. R. PHUKAN: So far as Assam is concerned, this will be neither desirable nor practicable, because, there is some sort of crop in the field all the year round. I am supported by Mr. Milroy in this matter. It

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will entail a lot of trouble collecting them, keeping them in safe custody and handing them over again and fixing the seasons. It is not necessary either.

Mr. DAVID: The same conditions exist in the Punjab. They are not in favour of imposing any seasonal restrictions.

Mr. NICHOLSON: In my district, the guns are taken away at the end of March. I think the Local Government are in favour of taking this action.

Mr. DEVI SHANKER KHANDELWAL: If vegetables are taken as crops, this suggestion is impracticable.

Mr. T. R. PHUKAN: In the licence it is stated that it is for the protection of crops and cattle. That is in the all-India licence clause. The protection of cattle will continue all the year round.

Mr. CHAIRMAN: I think we had better leave this to Local Governments. In view of the different conditions prevailing in different localities, the question of limiting licences for crop protection to certain seasons of the year should be left to the Local Governments for decision.

Sir PETER CLUTTERBUCK: My impression is that it was given up in the Central Provinces because it was impracticable. There is always the question when the crop season is over and when the other one begins.

Dr. BAINI PRASHAD: This might be dropped altogether.

Mr. CHAIRMAN: Yes.

We will now go on to consider item No. 5. The printed agenda contains a copy of the agreement concluded at the International Conference for the protection of the Fauna and Flora of Africa. We have been called to give advice to the Government of India as to whether they should adhere to the provisions of this Convention, and if so, to what extent. I should like to say at the outset that India constituted reserved forests long before Africa had any Forest Department at all, so that, most of the areas occupied by forests in India is now reserved forest. India is very much more densely populated than Africa. There are comparatively very few areas in India where you could constitute a National Park of the size of the Kruger National Park in Africa or of some of the National Parks in America. In areas containing valuable forest, no Government of an Indian Province or State will consent to forego the valuable forest revenue for the sake of constituting a Natural Park, so that any National Parks that may be constituted in India in the future must necessarily be areas of reserved forests. It may be that areas of reserved forest can be found consisting largely of grass land, or of tropical rain forests, but in normal areas, and in the great majority of provinces, you would be quite unable to find any area comparable to the National Park as depicted in these articles, so that, in many ways, this Convention is not entirely suited to the conditions of India. On the other hand, several of these articles we could adhere to with great pleasure. If we accept this Convention, we are only bound to adhere to Article 9 under which we contract to take necessary measures to control and regulate the import, export, traffic in and the manufactured articles from trophies as defined in para. 8 of the Convention, with a view to preventing the import or export and dealing in trophies other than have been originally killed, captured, or collected in accordance with the laws and regulations of the territory concerned. The article goes on to

say that the export of trophies to any destination whatever should be prohibited unless the exporter has got a certificate permitting exports issued by a competent authority. There is no reason why we should not support this Article. Article 10 deals with the use of motor vehicles or aircraft for the purpose of hunting, killing or capturing animals. We have already in this Conference agreed that this pernicious habit should be prohibited. As regards the establishment of National Parks, I have already commented on the state of affairs in India. I am given to understand that the United Provinces propose to establish something in the nature of a National Park. I believe other provinces will follow suit when they can find suitable areas for the purpose. As regards Strict Natural Reserves, the Forest Department have reserved certain small areas in which original and natural vegetation will be allowed to proceed. These areas consist of particularly fine groups of trees—single trees or groups of trees—and samples of the natural vegetation of the Indian Empire which will be preserved and they will be available in the future for any student who wishes to study the progression of natural vegetation. Apart from these areas, no particular object will be served in reserving large areas of land in which you are going to do nothing. The Indian Forest Department generally manages the local vegetation to the best of its ability. We do not change appreciably one species into another, and certainly, no Government is going to forego considerable forest revenue for the sake of leaving a large stretch of country entirely untouched. In my experience, the general result of leaving such areas untouched is that it becomes a mess. I should like to mention that this question of Strict Natural Reserves was only entered in the original Convention on the wish of the French, because they had some. Other countries merely agreed to enter the Strict Natural Reserve to accommodate the French. So, we need have no qualms in saying that India hardly needs such reserves. I have asked Mr. Shebbeare to go into the question in detail, *i.e.*, as to what extent India can adhere to this agreement, whether they should adhere to it or not, and whether India should have a Convention of its own or what is the best advice that this Conference can submit to the Government of India.

Mr. SHEBBEARE: I think we should recommend to the Government of India to assume the obligations contained in Article 9, paras. 3, 8 and 9 of the Convention. I do not think that we can recommend them to accept Article 3, because you have got to start straightaway taking steps to make either National Parks or Strict Natural Reserves. If you are not in a position to do that, you have got to start getting land ready for this. Article 13 says that if the Convention is accepted at all,—and it may be accepted only as regards Article 9—it is open to that Government at any time to accept the other provisions. What I think the Government of India should do is to accept in part, *i.e.*, Article 9, paras. 3, 8 and 9 and any other parts that the members of this Conference think it desirable, but I do not think that we are in a position to accept Article 3, which says that we must at once either start laying out Strict Natural Reserves or National Parks, or if we do not make them at once, we must start taking steps to get land that will be suitable for these. As you have said, Sir, the Strict Natural Reserve is a difficult question. I am afraid that a National Park in the sense of Article 2 is also a difficult question, because it says that the land must be set aside for the preservation of wild vegetation—I am quoting only the relevant words—and I do not think that we can bind ourselves to do that in the

case of reserved forests which are practically the only places where we can attempt anything like a National Park. So far as Bengal is concerned, I think it would be impossible to accede to Article 3, and I think we should accede only to Article 9, paragraphs (3), (8) and (9). If you look at Article 13 you will see that we have practically a choice of either acceding to the whole Convention or only to Article 9, which concerns the import of trophies from other countries.

Mr. CANNING: I wish to intervene at this early stage in this matter because I think it is most important that we should first of all decide, before we consider the extent to which we can accede to this Convention, whether we want a Convention for India to which all of us can accede. I do not think there is any doubt about it, but I think that the one valuable thing which we could record at this stage is to have a Convention to which we can all accede, either in whole or with certain reservations. I do not think we want to start dealing with the details of any other Convention until we have decided that point.

Sir PETER CLUTTERBUCK: This African Convention is really concerned with the formation of National Parks, Strict Natural Reserves and Other Reserves. So far as I can gather this has been proposed and agreed to in Africa because there are no big areas like we have in India of reserved forests, where we have been protecting game for the last 50 or 60 years. Had such reserves existed in Africa, I feel certain that this Convention would have been a different document. So far as my experience goes, it is quite impossible for us to make a National Park or Strict Natural Reerve or Other Reserves in India. 'Other Reserves' mean reserves with no shooting permitted at all. We are not prepared to do any of those things. We can of course accede to Article 9, as Mr. Shebbeare suggests, and to Article 10 about the abolition of motor car and flashlight shooting *in toto*. But that does not carry us very far. It would be much better if we could draw up a Convention of our own. We are really streets ahead of Africa in the matter of game protection and I do not think we should try to fit ourselves into a scheme which in many ways would be a retrograde step.

Mr. SHEBBEARE: I think we all agree with what both Mr. Canning and Sir Peter Clutterbuck have said, but the proposal on the agenda is to consider the extent to which India can accede to this Convention, and if we stick to the agenda the first thing to decide is whether we should or should not accede to this Convention. I quite agree that a convention of our own is also necessary.

Mr. CHAIRMAN: We can certainly consider the making of a Convention of our own, but we have to answer the question put to us by the Government of India who have been asked to give a definite answer by the Home Government. So, though we may recommend the formation of an Indian Convention, we must now decide whether we should accede to this Convention in whole or in part.

Mr. WIMBUSH: I agree entirely with what Sir Peter Clutterbuck and Mr. Canning have said, and I think our answer to the Government of India is almost bound to be that there is nothing to be gained by acceding to this Convention.

Mr. SHEBBEARE: I do not think there is any harm in acceding to Article 9.

Mr. CANNING: My personal view is that we will land ourselves in a large number of avoidable difficulties if we do accede to this Convention, because our circumstances are so very different. We proposed a National Park in the United Provinces but it is not a national park in the sense of this Convention, that is, we do not propose to stop forest work in it at all. Our object in calling it a National Park is to have a sanctuary which is established by legislation and which cannot be affected by executive order. That is the difference we make and it is a material difference. We have merely started a new class of reserve. We already have and can establish sanctuaries by executive order in our reserved forests. As regards this Convention, we could use it as a guide for an Indian Convention, but in view of all the reservations that would be necessary I do not think we should attempt to adhere to it as it stands.

Mr. SHEBBEARE: I agree with Mr. Canning, but I think it would be a pity if we do not accede to Article 9 of the Convention, which we can do without committing ourselves to any other of its provisions. There are in fact only two points on which you either accede or not, and those are contained in articles 3 and 9. It does not in any way hurt us to accede to Article 9, and in some cases it might be of very great value to us. It will strengthen our hands very much. The Convention permits us to accept Article 9, paras. (3), (8) and (9), and no more and I do not see what possible objection there is in doing so.

Mr. DAVID: I agree with that, and perhaps para. 10. I do not think it can do us any harm. Under Article 19 of the Convention we can, if we make our own Convention subsequently, denounce at any time our adherence to this Convention.

Major CORBETT: I agree that we should co-operate so far as Articles 9 and 10 are concerned.

Mr. CHAIRMAN: I should like to hear representatives of Indian States on this matter.

Mr. KHANDELWAL: On behalf of the Rewa Darbar I submit that we are agreeable to the general principles of game preservation, but the State would not be prepared to commit itself to a general Convention. They would keep in view any decisions arrived at here but I cannot commit them to anything.

General N. G. SHINDE: The States cannot commit themselves to any proposals. We will hear the discussion and the decisions arrived at will be considered by our administrations, who may assent or not after they have considered the matter.

Mr. MACHAYA: Our conditions are peculiar. The preservation of fauna and flora has been going on ever since the Forest Department took over the management of forests. We protect game.

Mr. CHAIRMAN: What is your personal view? Should India accede to Articles 9 and 10?

Mr. MACHAYA: I think we might accede to Articles 9 and 10.

Mr. CHAIRMAN: Well, is it the general view of this Conference that Mr. Shebbeare's proposal should be accepted and that we should advise the Government of India to adhere to Article 9, paras. (3), (8) and (9) of the Convention?

The proposal was carried.

Mr. NICHOLSON: Should acceptance be made conditional on the signatories of the African Convention accepting whatever articles may be laid down in the Indian Convention in regard to the import of trophies from here?

Mr. SHEBBEARE: That is my point. That is what we can ask them to do if we accept this article in the African Convention. We are helping them and we can certainly ask them to reciprocate.

Mr. CHAIRMAN: Now Article 10. Should we accept Article 10 or confine ourselves to Article 9?

Mr. SHEBBEARE: Under Article 13 we shall have to confine ourselves to the acceptance of Article 9 alone. We can do that but we cannot pick and choose other articles.

Mr. CHAIRMAN: Gentlemen, do you wish this Conference to recommend that an all-India Convention dealing with the subject of preservation of fauna should be drawn up?

The Conference expressed assent.

We cannot possibly attempt to do it here but if we pass a resolution suggesting that an all-India Convention should be drawn up, we can get along with the work of drawing up a draft and when it is ready another Conference similar to this might be convened to deal with it after it has been circulated to all concerned.

The Conference agreed.

We now come to item No. 6.—"To consider whether the convening of an Asiatic Conference in London is desirable."

Sir PETER CLUTTERBUCK: I think the Society for the Preservation of the Fauna of the Empire would like an Asiatic Conference. They were really the chief factor in getting the African Conference organised and they would like to do the same thing with Asia. We have been asked to advise whether from the Indian point of view this Asiatic Conference is likely to be very useful. India itself is so big a country and the conditions of Asia vary so greatly that it is a question for us whether we think it would be really useful to have such a Conference just yet. Personally I have always stood in favour of doing something for India first and once we have done something for India it would then be the time to have an Asiatic Conference if we could show that it was likely to produce good results. This is one of the last letters I have received from the Secretary of the Society. He says:

"If and when a Pan-Asiatic Conference takes place, it will be a great triumph for India if its representatives can state that the question has already been gone into by the Indian Government and arrangements made whereby it will conform to the general principles which were agreed upon at the 1933 Conference and duly set forth in the Convention which emerged therefrom."

If we could get our own convention we should be in a stronger position still. It would please politically minded people to think that India was leading the way in this respect so far as Asia was concerned.

Mr. CHAIRMAN: I must say that I agree with what Sir Peter Clutterbuck has said. I cannot see that at the present moment India can derive any benefit from taking part in such a Conference. I think we should be much

better advised to devote our energies to getting what we have decided at this meeting enacted and preparing a convention of our own. I think when that has been done, the convening of an Asiatic Conference might possibly be of some benefit to Asia. But at the present moment my personal view is—I am not speaking for the Government of India—that the convening of such a Conference would be entirely infructuous. India has not yet really settled the whole question of the preservation of her fauna. We hope that the time will now shortly come when all these matters we have discussed at these meetings here will be in a more satisfactory state than they are at present; but at the present moment I cannot see that the convening of such a conference which would probably be held in London and on which ambassadors of the various Powers of Asia would be represented would serve any useful purpose at all. Unless there is opinion here to the contrary I think the best advice we can give the Government of India is to say that the convening of such an Asiatic Conference at the present moment appears to be entirely inopportune and that the matter should be anyhow deferred to a very future date.

Mr. SHEBBEARE: I do not quite agree with all that, Sir. If we do not come in on an Asiatic Conference, there is the possibility that an Asiatic Conference may be held nonetheless? If a Conference is held, would it not be a good idea to have some of our people on it. I admit that things are not too good in India, but at least we have more experience than most countries of what can be done and what should be done. Unless we have some representative of India at the Conference, we shall find that countries like Malaya would be rather half-hearted in their measures. If we can say what we are doing in India and say that it is perfectly practicable, it would strengthen the hands of the rest of Asia.

Mr. CHAIRMAN: I certainly agree that, if a Conference is held, India should be represented. But my view is—and I think it is the view of this Conference—that the holding of such a conference at the present moment serves very little useful purpose.

Mr. MILROY: Some of us here are interested in animals in Asia which are not necessarily found in India and I think that if the Society for the Preservation of the Fauna of the Empire, which has done so much for the animals of the Empire, is in favour of an all-Asiatic Conference, it is pretty certain that from the information in their possession they will do some good possibly to save the animals in other parts of Asia and that if we go to the length of saying that we are not in favour of it we are rather pouring cold water on the whole thing. I do not think we can consider only India in this case. There are animals in Malaya and Java which require protection. An Asiatic Conference might help very considerably in calling attention to the necessity of protecting them and in that way we shall be pullig our weight. We might possibly say that India is not ready for the immediate convening of an Asiatic Conference. Personally I am interested in animals elsewhere. I think an Asiatic Conference ought to be called, because the African Conference has produced excellent results. It would be parochial to turn it down because it will be of no use to India.

Sir PETER CLUTTERBUCK: We should put our house in order first and have our own convention. Then we can say "Now, let us have an Asiatic Conference." We are in favour eventually of an Asiatic Conference when the time is opportune. We certainly ought to have one sooner or later.

Col. Ross: One point is rather important in this connection. After the separation of Burma, you will have Assam bordering on a State with a different form of Government. Would it not be a good thing to consider that point in considering the question of an Asiatic Conference?

Mr. SHEBBEARE: I quite agree with what Col. Ross has said. We ought to have some *bandobust* with Burma, if Burma is separated. All the two-horned rhinoceros are on the boundaries.

The Conference agreed to the following Resolution:—

The Conference considered that the convening of an Asiatic Conference was at the present moment premature, but that, if such a Conference were held, India should be represented.

The Conference met on the 30th January 1935, at 11-15 p.m. with the Hon'ble Khan Bahadur Mian Sir Fazl-i-Husain, K.C.S.I., K.C.I.E., in the Chair.

CHAIRMAN: Gentlemen, I understand that certain resolutions were drafted and have been circulated and they are now before you. I suppose it would be the right course now to take these resolutions one by one and I shall request Mr. Trevor to be so good as to take up Resolution No. 1 and to read to you such parts of it as contain a definite recommendation. Then it will be open to any member to make any observations he likes on each part or to move an amendment if he so desires. Then these amendments if moved will be disposed of in the usual course. I will request Mr. Trevor to be so good as to read resolution No. 1.

Recommendations 1 and 2 under item 1 were read.

Mr. ROSS: I propose that the brow antlered deer and the white winged wood duck of Assam be added to paragraph 1.

Mr. SHEBBEARE: I second the amendment.

Mr. TREVOR: The brow antlered deer is found in Manipur and also in Burma and I happen to know it is decreasing very rapidly. Unfortunately we have no representative of Burma here. Has anybody any observations to make.

Dr. BAINI PRASHAD: "Monitor Lizard" should be changed to "Monitor Lizards" because there are more than one species which deserve protection.

Mr. DONALD: On the other hand I wish to point out that the Monitor Lizard is not particularly sought after for its skin; and it is a great egg eater. I do not know that it deserves special protection in the Punjab. I suggest the addition of the words "except in the Punjab". Those provinces in which protection is needed, might give it.

All representatives of provinces *except the Punjab* agreed that the Monitor Lizard wanted protection.

Mr. SHEBBEARE: I move this additional Resolution:—

That this Conference recommends that all Local Governments who have not already done so should seriously consider the possibility of detailing one or more of their Forest Officers for the special duty of preservation of wild life as also the advisability of appointing suitable persons as Honorary Game Wardens with powers of Forest Officers to enable them to give effective assistance in the preservation of the fauna and flora in their neighbourhood.

Mr. DONALD: I second the resolution.

Mr. PRATER: I support the resolution. Our Society made a similar suggestion to the Bombay Government to appoint Honorary Game Wardens to supervise certain forests near Bombay. Many gentlemen of status offered to do this work in an honorary capacity. The Government of Bombay were not able to consider it at the time.

CHAIRMAN: Do you mean this should be their exclusive work or in addition to their other duties.

Mr. SHEBBEARE: I mean exclusive work. I do not say all provinces would be able to afford to do it but I think we should recommend that it should be done.

CHAIRMAN: You mean that in addition to the Chief Conservator they should put on another officer and if so, of what status?

Mr. SHEBBEARE: I mean a young and keen Assistant Conservator.

CHAIRMAN: Another Assistant Conservator holding an all-province charge.

Mr. SHEBBEARE: That would be the idea. My province in giving me orders before coming here said that I should not commit them to anything that might mean expenditure—but they need not agree unless they want to.

CHAIRMAN: There are many practical difficulties in an all-province charge involving travelling and so on. There is no reason why the usual staff, if reminded of this work, should not do it in a fairly satisfactory manner.

Mr. SHEBBEARE: Sir, the existing staff will do all they can but I still think it is a great help to have one man whose special business it is. He will keep everyone up to the mark. We have got two other specialist officers in Bengal and they certainly have been extremely useful.

CHAIRMAN: Then what about the States? Are they to be asked also to appoint whole-time officers exclusively for doing this work?

General SHINDE: Sir, Baroda does not want this—our officers are competent to do the work.

CHAIRMAN: You do not imply that the officers in the provinces are not competent!

Mr. WIMBUSH: In Madras the Government are only waiting for the recommendation of this conference before putting this suggestion before the Finance Committee.

CHAIRMAN: But Madras has been most unwilling to avail themselves of the services of forest officers whenever they have been offered. However, just as you like. It is a counsel of perfection, but if the Conference wish to record this counsel of perfection I have no objection.

Recommendations 3—6 of Item 1 were read.

Mr. DONALD: Might I suggest, Sir. that after the words "nature study" the words "with the aid of lantern slides" be added.

Mr. TREVOR: I do not think we ought to include it. Most lectures have lantern slides.

Mr. PRASHAD: But lantern slides of this nature are not available. Unless special sets are available it would not be possible to obtain what is wanted.

Mr. PRATER: We have lantern slides in Bombay dealing with British birds and polar bears but very little of Indian fauna.

Mr. TREVOR: Very well, it will then read—

Recommendation 3 (4) That suitable lantern slides for illustration purposes should be provided.

Resolution under item 2 was read.

Col. OLVER: I suggest that we might leave out the words "grazing in forests". (This was done.)

Major CORBETT: I would like the word "free" added after "out".

Col. OLVER: I doubt if it would be wise to insert the word "free". It might tie the hands of provinces. As long as it is carried out I do not think it matters much to this conference who pays for it.

Major CORBETT: I would like it to be free in our province.

Col. ROSS: I think we might add other diseases as inoculation becomes possible.

Col. OLVER: Yes, I think it would be a good thing. In fact, it would be an advantage to suggest that if suitable inoculation for other diseases becomes available it should be adopted.

CHAIRMAN: Why should not the local societies when such a discovery is made at once move in the matter. We cannot hope to find out everything that will take place in the next few years.

Mr. TREVOR: I think the point would be met by removing the word "such".

Resolutions on Item No. 3.

Recommendations 1—3 were read.

Major CORBETT: Mr. President and gentlemen; I come from the jungles where I have spent the whole of my life from the time that I was able to walk. I am not versed in the language of the Council Chamber and I beg that you will forgive any shortcoming that there may be in my language in putting my case before you. I would like this Conference to pass a resolution to prohibit the sale of game. I would beg you to remember that we live in a country in which two-thirds of the population have a religious feeling against the taking of life and in which the other third of the population are sportsmen. I feel that in permitting licences to be obtained for the sale of game we are condemning all the wild life in our forest. This licensing is going to be a very difficult matter indeed and I do not see how you are going to get the machinery to keep it within bounds. In big cities like Delhi or Simla it may be possible to control it to a certain extent. But how are we going to control the sale of game in the bazaars of the foot hills at the very edge of our forests. It will be impossible to control

them there and I feel that if we license it we are condoning the offence. I do not think there is a member here who would condone the trade in blood which is what it resolves itself into. It would be be very easy to prohibit the absolute sale of game but I do not see how you are going to do it under a licence. So my point is that here in the country that we live in, with all its difficulties and places that are so far away from control, you are going to find it practically impossible to control the sale of game, and I would beg you to reconsider this matter, over which I am afraid I have already taken up much of your time, and I make this last-minute appeal to you for the game of the future. We have all enjoyed the game in the forest up to the present—let us leave something for the future, and if you prohibit the sale of game you will have done a lot towards perpetuating these beautiful animals and birds in India. If you want to make any provision for the sale of any particular animal or bird, it is a different matter, but do not do it wholesale. What harm have the chital and other animals we have in our forests ever done to human beings that they should be condemned and how are you going to prevent their being brought to the market. There are motor cars and motor lorries bringing them in from far distant places to centres where they are being sold. Now, I am, as I told you, from the jungles and I can assure you that the people who trade in flesh are a very undesirable lot of people. They are practically all addicts to narcotics in different forms. And they tell me that it is necessary for them to take these drugs in order that they may be able to sit up long hours over water-holes or up in trees over forest runs and all the people who deal in blood of that kind are undesirable. Why permit them to slaughter our game. Appeal was made to you by one of my friends who asked why should a man who has got a partridge on his ground not kill it. I am not objecting to his killing a partridge that calls in the morning or black buck that runs across his field. He can do it just as I would kill and eat a partridge that I had in my own ground. But it is the slaughter that I am objecting to. Why have this very objectionable trade? For the last time I appeal to you, gentlemen, not on behalf of the human being but on behalf of the wild life, to reconsider this point before it is too late. This is a very important conference and any resolution that you pass will carry great weight and I can assure you that you will have the support of everybody, because as I told you two-thirds of the population of India have a religious prejudice against taking life and the other one-third are sportsmen.

Rai Sahib Lala GOPAL DAS: Sir, I appreciate the motive of Major Corbett in moving this Resolution but he forgets that as far as the Punjab is concerned we are entirely in a different position. The majority of the population in the Punjab are meat-eaters and at times they require variety. They are not satisfied with mutton, etc., but they sometimes want partridge or kuail or duck, and under the new Act that we have in force in the Punjab we have the sale of game properly controlled by the issue of licences. And I think there would be no harm if the sale of game is sanctioned by this conference under certain limited conditions. I do not support Major Corbett in this resolution.

Mr. WIMBUSH: Sir, if there is any difficulty in supporting Major Corbett, which I would do wholeheartedly myself, would it be possible to prohibit the sale of big game, *i.e.*, deer and similar things, leaving out partridges, etc.

Rai Sahib GOPAL DAS: Yes, there is no objection to that.

Mr. SHEBBEARE: Sir, I thoroughly agree with Major Corbett. I want to work for it in Bengal ultimately,—the total prohibition of the sale of all wild animals. The only thing is that if we pass that resolution we have got the Punjab straight against us and the resolution will not be agreed to by the provinces. I would rather put it in with a proviso giving Governments a chance to make their own rule and then I can persuade my own Government to try and get total prohibition. That is my attitude.

Col. ROSS: Why not make the point that there should at least be control but that prohibition is the right thing, if we can possibly manage it. And then go on to the second para. and say if prohibition is difficult or impossible, the limitation of sale should be considered.

Major CORBETT: Sir, I would like to put it to the vote.

Khan Sahib ALLAH BAKHSH: Sir, I would like to say a few words. In the Punjab we do not sell big game and the sale of small game is largely in the hands of people who live by catching birds and selling them. We are now limiting their activities but if you attempt to prohibit it altogether you will have a repetition of the American experience in regard to liquor. I think it will meet the case if we prohibit the sale of big game.

Mr. SHEBBEARE: Sir, I do not agree with that as far as Bengal is concerned. I think that there is a lot that can be done in the way of preserving small game in Bengal. I think it should be left to the Local Governments. I agree with what Col. Ross has said but I do not want to water it down by making it only big game.

Mr. PRATER: In the Bombay Presidency, there is an enormous trade in black buck and chinkara. Such prohibition will be very helpful in saving these animals from destruction. They are on the point of extermination outside forest areas.

Mr. CHAMPION: This leaves the question of migratory birds out altogether. There is no possible harm in shooting duck. We entirely agree with Major Corbett's sentiments, but the question is, "Is it practicable?"

Mr. TREVOR: That is the whole question,—if we here state that all sale shall be prohibited, we shall immediately be up against the Local Governments. When they come to consider legislation, you will have people in the Legislative Councils getting up and saying. "These wild life fanatics propose prohibition of all sale. But there are a certain number of the people who are making a living out of this." I entirely support Major Corbett, but I cannot see that we shall do ourselves or wild life any good by supporting a statement that all sale should be prohibited. If all sale could be prohibited in the provinces, so much the better. But is it a practical proposition? It certainly is not in the case of the Punjab. Is it so elsewhere?

Major CORBETT: I have no objection to excluding migratory birds, Sir. Two years ago, a resolution was moved in a Municipality. The Municipality consisted of 15 members, of which 12 are Indians. The resolution was to turn the Municipality into a bird sanctuary. There are 125 different kinds of birds in the sanctuary. Six months ago, that resolution was followed up by another asking the Municipality to prohibit the sale of game within municipal limits. Again, out of the 15 members

there were 12 Indians, and without one dissentient voice they agreed to both the resolutions. So, I do not feel that there will be that opposition that you contemplate in the Assembly or the Legislative Council against a resolution of this kind. I think we will have the sympathy of everybody.

Mr. SHEBBEARE: If there is going to be any alteration, I am very anxious to say that we should not exclude migratory birds or birds as has been suggested. All these questions are so much for the provinces themselves. We can give them all powers and leave it to them. We must give them a loophole; otherwise, they will simply throw out the whole thing.

Mr. CHAIRMAN (The Honourable Sir Fazl-i-Husain): I think the position has been correctly summed up by the last speaker. The position in India as a whole, as far as I can judge, is not in favour of total prohibition of any kind. If we make recommendations—mind you, they are only recommendations—of a nature that are far-reaching, the chances of the recommendations being taken as the sentiments of faddists is not very remote. What you want them to think is that these are the results of deliberations of fairly sane and sound people, not extremists or those who are committed and devoted to one school of thought. If you wax eloquent in the Assembly or in a Legislative Council as to blood money and so on, they can very well retort in many ways and go on retorting for a long time. Therefore, I think we had better remain moderate and sober. Remember that this is our first Conference. It need not be the last either. Wild life is going to last for a long time. People will attack you for a long time and we will have to defend ourselves for a long time. Therefore, let us be content with a first step in this direction and not try to say the last word on the subject. This is our first attempt. Let us see how we get on. Within the next five years or so, another Conference like this might be called. In the meantime, those who come after us here will be able to judge to what extent response has been forthcoming from the provinces. Subject to what I have submitted to you for your consideration, I am entirely in your hands. If you prefer to make an alteration, I will take up the three points separately and put them before you and take your views and then record in our proceedings whatever your decision may be. But on the whole I am personally of the opinion that in this draft resolution you have gone a fairly long way and that you might well be content to leave the case there.

Recommendation was read.

"The netting, trapping, snaring or noosing of wild birds or animals should be prohibited throughout the year or, if it is necessary to permit this under licence, the rules should allow local authorities to settle from time to time the number of such licences which should be granted in any area and the dates between which they should be valid."

M. T. R. PHUKAN: I suggest that after the word "animals" the words "needing protection" be added. Otherwise, catching of elephants, for example, will be prohibited.

Mr. TREVOR: I do not think there is any difficulty about inserting the words "needing protection".

Recommendation 5, was read.—Certain animals and birds requiring social protection should be scheduled by local Governments and should be brought under the definition of "forest produce" in Section 2(4) (*a*) instead of 2(4) (*b*) of the Forest Act."

I would explain that under section 2(4) (*a*) of the Forest Act the following, whether found in, or brought from, a forest or not, is forest produce, and under that is included at present, timber, charcoal, wood-oil, resin, and so on, whereas under 2(4) (*b*), forest produce includes wild animals and skins, tusks, horns, bones, silk, cocoons, honey and wax, and all other parts of produce of animals. They are forest produce at present only when found in or brought from a forest. This will of course entail an amendment of the Forest Act.

Recommendation 6 was read.

Mr. PRATER: I should like to add the Indian lion.

Major CORBETT: I would like to add the musk deer.

Recommendation 7 was read.

Rai Sahib Lala GOPAL DAS: This resolution requires a little clarification. When we were discussing the Punjab Act, the question was raised how the case will be treated if any sportsman, previous to the enactment of the Act, was in possession of any skins, horns or other trophies,—whether that possession will be considered lawful or unlawful. It was decided later on to put in a provision in clause 4 to the effect that nothing in this section shall be deemed to prohibit the possession by any person of skins, antlers, horns or other tropies, or the possession by any person of the offspring of any wild bird or wild animal. In case this contraband clause is put in the legislation, what is going to happen to those who are already in possession of, say, a Rhino horn? If I have such a horn, and I hand it over to my son or grandson, how is he to produce a certificate of origin?

Mr. SHEBBEARE: The idea is to get one certificate for such trophies, and that certificate will last indefinitely. Government will issue certificates for existing trophies. They will call on people to say what they have. As far as the Rhino horn is concerned, it would not actually affect a very great number of people. The total number of Rhino horns in India is not so very great. That was the idea of the Government of Bengal, I believe.

Mr. TREVOR: I think this question had better be left alone to be discussed by Local Governments. The mere fact that we say that certain things should be made contraband leaves the matter entirely in the discretion of Local Governments.

Recommendation 8 was read.

Mr. CHAMPION: I object to this clause very strongly. The word "occupant" is not alright. If he gets 6 inches out of his car, he ceases to be an occupant. The draft is nowhere near strong enough. I believe in Africa there is a £100 fine for shooting an animal out of a motor car. I suggest the following:—

> "That the attention of Local Governments should be drawn to the growing and evil practice of shooting, hunting or chasing wild animals from wheeled vehicles, or in the immediate vicinity of such, and particularly of motor cars; It is strongly recommended that Local Governments be asked to take steps to check this unsporting and destructive method of destroying animals."

Mr. SHEBBEARE: In Africa, the chasing of antelope is a disgusting business. The thing as it stands prevents you from shooting a jungle *murghi* which seems to me going too far.

Mr. CANNING: I support Mr. Champion in the request that at any rate the word "motor car" should come into the resolution. That was a very strong point we took yesterday.

The Honourable Sir FAZL-I-HUSAIN: Does not "wheeled vehicle" include a motor car?

Mr. CANNING: We want to mention motor cars although it may appear redundant. We want to give emphasis to it.

Mr. WIMBUSH: Yesterday we passed a resolution covering the points raised by Mr. Champion, and some of us, including myself, were extremely strong in this matter of not allowing shooting within a 100 yards of a motor car. The proposed resolution does not refer to that. It seems to have been altered. May we know what was proposed and agreed to yesterday?

Mr. SHEBBEARE and Col. ROSS said they had altered the wording of yesterday's draft with a view not to penalize motorist who got off to shoot a partridge or other bird.

Mr. WIMBUSH: I maintain that the prohibition is necessary in the case of birds. I have known of cases where people have laid a trail of grain on roads and accustomed the murghis to finding this trail, and these people have then come along in a car and shot the birds up to such an extent that none have been left in the vicinity.

Mr. CHAMPION: There is another point. On railways running through reserved forests subordinates frequently come along on trolleys and shoot large numbers of birds on the line.

Mr. TREVOR: This will be sufficient.

"8. That the attention of Local Governments should be drawn to the growing and evil practice of shooting, hunting or chasing of wild animals from or in the vicinity of wheeled vehicles, particularly motor cars. It is strongly recommended that Local Governments be asked to take steps to check this unsporting and destructive method of destroying animals."

Mr. CHAMPION: I would like to add "both inside and outside reserved forests".

Major CORBETT: Would it not be possible to insert "and birds" after "animals"? Or to add "except vermin"?

Mr. TREVOR: That can be left to local authorities.

The conference agreed to this resolution.

Resolution 9 was read and adopted.

Resolution 10 and 11 were read.

After some discussion it was suggested by Sir Peter Clutterbuck that the two might be combined, as follows:—

"10. That shooting by sitting up over salt licks or water holes be prohibited except in the case of vermin."

It was suggested that the word "holes" should be omitted.

Mr. SHEBBEARE: The idea underlying this was to stop the practice of sitting up over water holes to shoot deer. It has now been extended to such an extent that even sitting up over a kill which has been dragged near water will be penal. That is going too far. I am all against slaughter but we must give people something for their money.

Mr. CANNING: The rule in the United Provinces says:—

"Watching in the neighbourhood of water or salt licks between sunset and sunrise to shoot animals, other than carnivora, resorting to such places."

That is the actual rule which has been enforced for nearly 30 years without any great difficulty.

(It was agreed that the resolutions 10 and 11 be combined and amended on the lines of the United Provinces rule and that resolution 12 should be numbered 11 and so on.)

Resolution 11 was read.

Mr. CANNING: Would it possibly improve the value of the resolution if we added "not merely from a sporting but also from an economic point of view" after the words "protection of fish"?

(No objection was raised to this addition.)

Mr. DONALD: I would like to add an additional clause—

"That the protection of fish be placed under departments or bodies responsible for game protection."

Dr. BAINI PRASHAD: There might be an objection to that in areas like Madras, where there is a definite Fisheries Department.

Mr. WIMBUSH: Then the Government would not agree and it would be all right.

Mr. TREVOR: We might put in "where this is practicable".

The Conference agreed to the resolution as amended.

Resolution 12 was read.

Sir PETER CLUTTERBUCK: Could not something be put in about the compounding of offences? It would save the people as well as the officials concerned.

The CHAIRMAN: There are obvious objections. You cannot have justice administered by the prosecution without an intervening authority.

The resolution was adopted.

Resolutions 13 and 14 were read and agreed to.

Item 4.—Resolution under item 4 was read and adopted.

Item 5.—Resolution:

"The Conference recommends—

(1) that the Government of India should assume the obligations contained in Art. 9, paragraphs 3, 8 and 9, as permitted under Art. 13 (3) of the Convention concluded at the International Conference for the Protection of the Fauna and Flora of Africa in respect of all their territories.

(2) that steps should be taken to draw up an All-India Convention on the lines of the African Convention."

Mr. CANNING: In the agenda we are asked to consider the modifications necessary to make this Convention suitable for India. That is not dealt with in this resolution.

Mr. TREVOR: We decided that so many modifications are required that it would be better to have one of our own.

Mr. CANNING: There are many details to consider and if the Government of India propose to take action on our resolution I think it would be useful if they had even a general view of the members of this conference on this question. The opportunity of collecting those opinions will not arise very easily again, and presumably the next step will be the drafting of a Convention. So far we have nothing on record as to what extent the States would be prepared to come in. We want to arrive at something which will be generally acceptable. It seems to me that it will be very difficult for anybody to draft an Indian Convention without some indication of the views of various States and provinces

Col. ROSS: I would suggest that instead of saying "on the lines of the African Convention" we might put in "on the lines of the resolutions passed by this conference." That will give you the basis for the Indian Convention.

Mr. CANNING: I think we have not discussed to any very great extent the nature of sanctuaries. We have certain powers in regard to our reserved forests for constituting sanctuaries and we can always constitute those by executive order. But we consider that a sanctuary constituted by executive order has not got that degree of permanency which is desirable in this matter and it certainly has not got the degree of permanency which is indicated in the African Convention, and the question is whether States would agree to aim at forming sanctuaries which are authorised by legislation and consequently are subject to control by legislative councils and incapable of being done away with without legislative action.

Mr. WIMBUSH: We may leave out the words "on the lines of the African Convention".

The resolution as amended was agreed to.

Item No. 6.—

Mr. TREVOR: I have an amendment which has been handed in by Mr. Shebbeare. It reads:

"That the Conference is of the opinion that an Asiatic Conference in London is desirable in the interests of Asiatic wild life and that when such a conference is held India should be represented."

Major CORBETT: I second the amendment.

Mr. MILROY: Sir, I think the resolution as put down on the paper seems to imply that this Conference has definite information about other parts of Asia calling a Conference would be premature. Although we may know all about India, I do not think many of us know about other parts of Asia and if a Society like the Society for the Protection of the Fauna of the Empire thinks that the time is ripe, I think we can be fairly certain that they have information. Another thing was that it was said yesterday that India was not ready yet as the Conference will come too soon after this meeting. Surely the calling of an Asiatic Conference would take a very long time, probably 18 months or two years. Whoever started it would have to write to places like Tibet. It is incredible if it could be fixed in 18 months, by which time we will be ready.

CHAIRMAN: Is it possible for me to understand that in case Government is not in a position to take part in it, that Societies in support of the movement would be forthcoming to send a representative to it?

Major CORBETT: Yes, Sir.

CHAIRMAN: Because it is no use sending a representative either from British India or from Indian India unless the representation is such that it is in a position to bind India. Considering that Forest is a Provincial subject the Government of India is not in a position to bind India or British India unless it has the concurrence of provinces. The opinions received from the provinces are not in favour of it.

Mr. SHEBBEARE: At the time the Conference is held it is almost certain that there will be a certain number of people on leave; it would not be a great expense to the Government of India.

Mr. NICHOLSON: India has done a lot in this matter and it would be advisable from political and other points of view to hold the Conference in India.

CHAIRMAN: Is there any information as to the opinion of Asiatic countries in this matter?

Sir PETER CLUTTERBUCK: I have no information on that point. All I am given to understand is that the British Government are quite keen on such a Conference being called. At the present moment all that we have been asked to say is whether this Conference considers it to be desirable or not. I think it certainly is desirable at some time or other. The idea was that we should try and get local Governments to agree to some sort of policy and a convention here first before we tried to tackle other Governments. Unless our own house is in order it would be difficult.

CHAIRMAN: It seems to me that the likelihood is that many other Asiatic countries have not moved in this matter to the extent that we have done. Members of the Conference feel that although we have moved a great deal, it is not very much and a great deal has to be done.

Sir PETER CLUTTERBUCK: I think the idea was that we should draw up a convention and then ask each Local Government and State whether they would accede to it, and after that is done we would be a united body. Until we have a convention and we know that provinces are going to accede to it, it is premature to ask for an Asiatic Conference.

Mr. CANNING: I suggest an amendment that instead of "Would be premature" we have "will be desirable when the above All-India Convention has been prepared."

Col. Ross. There is a great deal of poaching on the Siam border and shortly Burma will be separated. Two horned rhinoceros wander over the border and some sort of convention is wanted to make it possible to stop poaching on each side.

CHAIRMAN: That will be one of the problems to be solved between Burma and India. There are many points that India and Burma would have to settle. No one is more cognisant of those than the Government of India now a days. There are two propositions before you, one is the original resolution, and the other is the amendment handed in and read to you. I wonder what the feeling on the subject will be in other Asiatic countries as to the venue of the Conference.

Mr. SHEBBEARE: I have no information, but I gather that the Society for the Protection of the Fauna of the Empire has made certain enquiries. I think it would not be desirable for us to hang back in any way, and, as Mr. Milroy said, it will take some time before any such conference can actually take place and in the meanwhile we ought to have some sort of convention. Though India may be ahead of most other Asiatic countries, I do not think it is quite right for us to ask the Government not to agree to participate in the Conference to be held by the Society.

CHAIRMAN: One would expect an Asiatic Conference to be organised by an Asiatic country. It is an objection which might well be taken by some country or other.

Mr. SHEBBEARE: The African Conference was held in London.

CHAIRMAN: The difference between the two proposals is that one does not mention any time. The other one says that it is at present premature. We had better amalgamate the two.

The following revised resolution was then put to the conference and was agreed to:—

"The Conference considers that the convening of an Asiatic Conference at the present moment will be premature but considers that such a conference is desirable in the interests of Asiatic wild life and that when such a conference is held India should be represented".

Mr. ADVANI: I propose the following be added under Item No. 1.

That a strict ban be placed on cinema pictures which are likely to create terror and consequently hatred for wild life and animals amongst the public, especially the children.

Mr. TREVOR: I second the resolution.

The Conference agreed to this as resolution 7 under item 1.

Sir PETER CLUTTERBUCK: I should like to propose a hearty vote of thanks to the Honourable Member for having so kindly come and presided over the meeting and also to Mr. Trevor who so ably deputised for the Honourable Member. I am sure the whole Conference is very grateful indeed for the way in which this work has been so expeditiously done and clear resolutions have resulted from our discussion.

Dr. BAINI PRASHAD: I second the resolution.

CHAIRMAN: It is very kind of you to thank me for being present, but it must be clearly understood that the whole work has been done by Mr. Trevor, who is undoubtedly entitled to the thanks which you have been

good enough to give him. My share has been a very limited one, just like that objectionable shikari who comes in a motor car and shoots. I am very glad that you have met here and I am very pleased to have had the opportunity of discussing these things with you and I trust we have made a good beginning and that the movement will grow rapidly and make progress through non-official channels. That is the one point which I feel even at this stage it is necessary for me to repeat. Much should not be expected from Provincial Governments or Provincial Legislatures; but if you do propaganda through non-official agencies, you really get right into the place where power will vest in the provinces and then you can do a lot.

I thank you all once more and thank you really for having devoted three whole days to this work. I wish you a very pleasant journey back to your places and I hope you will be able to communicate your zeal and enthusiasm to the places you return to.

Mr. TREVOR: I thank you very much for all the assistance you have given me.

ALL-INDIA CONFERENCE FOR THE PRESERVATION OF WILD LIFE.

Resolutions adopted at the meeting of January 30th 1965.

Resolutions under Item No. 1 of the Agenda.

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1. From a general review of the position of the fauna of India the Conference recommends:—

That the following species are deserving of special consideration:—

1. All kinds of Rhinoceros;
2. Wild Ass of Sind;
3. Sind Ibex;
4. Kathiawar Lion;
5. Musk Deer;
6. Cheeta;
7. Buffalo;
8. Monitor Lizards (except in the Punjab);
9. Pangolin: Assam—Shillong;
10. Caracal;
11. Brow-antlered Deer;
12. Pink-headed Duck: (Assam);
13. White-winged Wood Duck (Assam).

That all Provinces and States where these animals or birds are found should be asked to co-operate in order to afford them necessary protection and to prevent them from being exterminated.

2. The Conference agrees that the duty of preserving the fauna in areas under its charge should be definitely laid on the Forest Department but, at the same time, urges the necessity of co-operation on the part of the Police and Magistracy.

It recommends:—

That revenue derived from the following sources should be ear-marked for the protection of game and the payment of rewards:—

Shooting, fishing or game licences.

Fines for breaches of game laws.

That there should be the closest co-operation between the Forest Department and all associations, the object of which is the preservation of game and wild life. Where such associations cover large areas they would be well advised to form local committees.

The Conference is of the opinion that a portion of the money ear-marked as recommended above should be allocated to approved associations for the preservation of wild life.

3. The Conference recommends:—

(1) That the introduction of nature study as an optional subject in secondary schools be brought to the notice of the Educational Departments of Governments in India, Wild Life Associations and Boy Scout organisations.

(2) That the attention of the Educational Departments be drawn to the need for the provision of better facilities for the training of teachers in nature study and particularly as regards the provision of suitable books of assistance to them in teaching the subject.

(3) That more use be made of museums for the teaching of nature study and financial assistance be given them for lectures in natural history.

(4) That suitable lantern slides for illustration purposes should be provided.

(5) That steps be taken to issue cheap publications in various vernacular languages suitable for popular instruction.

4. The Conference recommends that Forest Departments should deal with game preservation in a separate section of their annual reports noting the numbers of animals shot and any particulars of the increase or decrease of animals or birds in their areas.

5. The Conference recognizes the valuable work of existing Natural History Societies and trusts that the activities of existing societies will be extended and new ones started.

6. The Conference recommends that all Governments in India who have not already done so should seriously consider the possibility of detailing one or more of their forest officers for the special duty of the preservation of wild life as also the advisability of appointing suitable persons as Honorary Game Wardens with the powers of Forest Officers to enable them to give effective assistance in the preservation of the fauna and flora in their neighbourhood.

7. The Conference recommends that a strict ban be placed on cinema pictures which are likely to create terror and consequently hatred for wild animals among the public especially children.

Resolution under item No. 2 of the Agenda.

The Conference considers the inoculation of village cattle against rinderpest as carried out in the Bison areas in Madras and experimentally in Bihar and Orissa and now proposed in the United Provinces for the protection of deer, in co-operation with the Veterinary Department, to be of great importance, not only for the protection of the game but also for domestic cattle and recommends that protective inoculation should be extended wherever possible.

Resolutions under item No. 3 of the Agenda.

The Conference is of the opinion:

1. That the essential and basic necessity in preventing the undue destruction of wild birds and animals outside forest areas lies in the prohibition, or at least the control, of the sale, purchase or possession of such birds or animals, whether dead or alive, and of all parts thereof.

2. That if the total prohibition of sale, purchase or possession is found to be impossible, it is important that there should be control by licence and that this form of control should include the maintenance of registers of sale and purchase and should further place on the licensee the onus of proving that purchase has been through a legally licensed channel. Taxidermists should be included in any licensing scheme.

3. That in any system of licensing it is important to differentiate between "killing, capture or possession" on the one hand, and "buying, selling or offering for sale" on the other.

4. That the netting, trapping, snaring or noosing of wild birds or animals needing protection should be prohibited throughout the year or, if it is necessary to permit this under licence, the rules should allow local authorities to settle from time to time the number of such licences which should be granted in any area and the dates between which they should be valid.

5. That certain animals and birds requiring special protection should be scheduled by local Governments and brought under the definition of "forest produce" in Section 2(4)(*a*) instead of 2(4)(*b*) of the Indian Forest Act, 1927.

6. That in certain cases (such as the Sind Ibex and the Wild Ass of Cutch) a special agency should be provided for the protection of particular species by the Government or Governments concerned and, in the special case of the Wild Ass and the Indian Lion a convention between the States concerned is necessary.

7. That in any legislation that may hereafter be enacted by Governments in India a clause should be inserted to allow of the notification from time to time of any species or part thereof as "contraband" that is to say, its possession, except under a certificate of origin, should be unlawful.

8. That the attention of Governments should be drawn to the growing and evil practice of shooting, hunting or chasing wild animals from or in the immediate vicinity of wheeled vehicles, particularly motor-cars and that a strong recommendation be made to all Governments to take steps to check this unsporting and destructive method of destroying animals both inside and outside reserved forests.

9. That shooting by artificial light should be prohibited at all times except, with the special permission of Government in the case of animals classed as vermin.

10. That watching in the neighbourhood of water or salt licks to shoot animals other than carnivora should be prohibited.

11. (i) That the importance of protection of fish should be recognized by Governments in India, not only from a sporting but also from an economic point of view. This should include legislation against:—

(*a*) The prevention of access to breeding waters.

(*b*) The destruction of fry in breeding areas.

(*c*) "Fixed engines" in streams and especially those which prevent the movement of fish to and from breeding waters.

(*d*) Killing fish by the use of explosives.

(*e*) Poisoning of water.

(ii) That the protection of fish be put under authorities responsible for game protection where this is practicable.

12. The Conference welcomes the recent legislation enacted under the Punjab Wild Bird and Animals Protection Act but is of the opinion that, unless offences under this Act are made cognizable, its enforcement will be rendered very difficult. It is further of the opinion that similar legislation, but with the amendments suggested above, in paragraphs 3, 6 and 7 could be adopted by other provinces with advantage.

13. The conference strongly recommends the formation of societies for the protection of wild life in areas where they do not already exist, and is of the opinion that one of their principal duties should be to assist in the enforcement of such legislation as may be adopted for the preservation of wild life in their areas.

14. The Conference emphasizes the importance of educating public opinion as, without strong public support, no efforts to preserve wild life can be effective. It therefore recommends that cocieties for the protection of wild life should make propaganda a principal part of their work.

Resolution under item No. 4 of the Agenda.

The Conference recommends:

(1) That all free guns licensed for the protection of crops should be restricted to single barrelled smooth bore muzzle loaders.

(2) That licence in form* No. XVI should have the particulars $\frac{\text{sport}}{\text{protection}}$ specified, that permits for sport should only be given to *bona fide* sportsmen whose status is such as to warrant such a licence.

(3) That in Thanas near forests the Forest Officer or the local shooting club, if any, should be consulted before new licences for sport are granted.

(4) That retainers' licences if allowed at all should be strictly limited.

(5) That licences in form† No. XIX should be limited in number and the area for which the licence is valid should be specified and restricted to the holding or village concerned.

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* Printed as Appendix I.

† Printed as Appendix II.

(6) That selected police and forest officers should be empowered under the Arms Rules to demand the production of a licensed weapon at any time.

(7) That ammunition for licences for protection or display should be limited to a definite number of rounds.

(8) That an entry of the quantity of ammunition purchased by a licensee should be entered on his gun licence.

Resolution under item No. 5 of the Agenda.

The Conference recommends:—

(1) That the Government of India should assume the obligations contained in Article 9, paragraphs 3, 8 and 9, as permitted under Article 13(3) of the Convention concluded at the International Conference for the Protection of the Fauna and Flora of Africa in respect of all their territories.

(2) That steps should be taken to draw up an All-India Convention.

Resolution under item No. 6 of the Agenda.

The Conference considers that the convening of an Asiatic Conference at the present moment would be premature but is of the opinion that such a conference is desirable in the interests of Asiatic wild life and that when such a Conference is held India should be represented.

APPENDIX I.

CONDITIONS.

1. This licence is granted subject to all the provisions of the Indian Arms Act, 1878, and of the Indian Arms Rules, 1924.

2. It covers only the persons named, and the arms and ammunition described therein and such retainers (if any) as may be entered in column 5.

3. This licence is valid to the extent specified in column 10, subject in the case of a licence having effect outside the province in which it is granted or renewed to any restrictions which may be imposed by any general or special order of a local Government in respect of the territories administered by it or subject to its control.

4. The licensee or any retainer acting under this licence shall not go armed with any arms covered thereby otherwise than in $\frac{\text{sport}}{\text{protection}}$; and, save where he is good faith for the purpose of $\frac{\text{display}}{}$ specially authorised in this behalf, in any Presidency town or Rangoon, by the Commissioner, Deputy Commissioner and Assistant Commissioner of Police, or, in any other place, by the District Magistrate or a Sub-Divisional Magistrate, he shall not take any such arms to a fair, religious procession or other public assemblage.

5. The licensee, at the time of purchasing any new arms, in the North-West Frontier Province at the time of purchasing of ammunition, and elsewhere at the time of purchasing of ammunition for rifles, other than ·22 bore, revolvers and pistols, shall cause the following particulars to be endorsed upon his licence under the vendor's signature, namely,—

(*a*) the name, description and residence of the person who takes delivery of the articles purchased;

(*b*) the nature and quantity of the articles purchased; and

(*c*) the date of purchase;

and, if the arms or ammunition are purchased from any person other than a licensed dealer, shall also cause the particulars specified in clauses (*b*) and (*c*) to be furnished in writing to the authority who granted this licence within such period as may be prescribed for this purpose by such authority.

6. He shall not purchase ammunition for rifles, other than ·22 bore revolvers and pistols in excess of the maximum which may from time to time be fixed by the local Government.

7. He shall forthwith give information at the nearest police station of the loss or theft of any arms covered by the licence.

8. He shall not possess Government arms and ammunition.

Explanation.—For the purpose of this condition—

(*a*) "Government arm" means a firearm or other weapon which is the property of the Government; and

(*b*) "Government ammunition" means ammunition manufactured in any Government factory, or prepared for and supplied to Government.

9. Condition 8 may be cancelled by the authority granting the licence is empowered to do so by the local Government, and an endorsement added showing the Government arms and ammunition which the licensee is authorised to possess.

10. Where the licence is granted for the purpose of sport, the licensee or any retainer acting under the licence shall observe such close season as may be prescribed by the local Government in respect of the game-birds and animals hereinafter set forth below.

11. The licensee shall report any change of his permanent residence to the authority who granted him the licence, and, in case of any such change, whether permanent or temporary, he may, at his option, apply to the nearest licencing authority for renewal of this licence should it be necessary.

12. The authority granting or renewing the licence has the right to enquire at any time during the currency of the licence whether the weapon or weapons for which it has been granted is or are still in the possession of the licensee, and to require its or their production for the purposes of such inquiry.

Notes.—Any breach of the conditions of this licence is punishable with imprisonment for a term which may extend to six months or to fine which may extend to Rs. 500 or with both. (Section 21 of the Indian Arms Act, 1878.)

Licensees are warned that in case they sell any arms or ammunition covered by the licences possessed by them to any person (other than a person exempted under section 27 of the Act) they are required to give notice forthwith of the sale together with particulars as to the name and address of the purchaser to the Magistrate of the district or to the officer in charge of the nearest police station. Failure to give notice as required above is punishable with imprisonment for a term which may extend to three years *or with fine or with both.*

FORM XVI.

[SEE RULE 33.]

Licence for the possession of arms and ammunition and for going armed for the purposes of $\frac{\textit{sport.}}{\textit{protection.}}$ $\frac{}{\textit{display.}}$

Fee—I. (*a*) If the licence is granted for ammunition of the kind referred to in Rule 33 (1), proviso (*ii*) *Free of all fee.*
(*b*) In the Attock District of the Punjab, if the license is granted for the purposes of village defence, *Free of all fee* otherwise—
(*i*) in disarmed district, eight annas, and
(*ii*) elsewhere, four annas, for each weapon; and
(*c*) elsewhere in British India—
(*i*) for a breech-loading pistol or revolver, Ten rupees.
(*ii*) for any other breech-loading weapon, Five rupees,
(*iii*) for other weapons, eight annas disarmed in districts and four annas elsewhere, for each weapon, provided that in Burma licenses granted for the purposes of village defence shall be free of all fee.

II. The abovementioned fees are payable in respect of licenses granted for the first time for periods of one year or less. Should the licence be renewed for a further period, and unless the licence is free of all fee, the following fees shall be payable in respect of each renewal for a period of one year or less—
(*i*) in cases to which clause (*b*) in paragraph I applies, the same fees, and
(*ii*) in cases to which clause (*c*) in paragraph I applies, five rupees, rupees two, and annas eight, and annas eight or annas four respectively, provided that in such cases application for renewal is made within one month of the date on which the licence expires and if application is not made within that period, the licensing authority may, in his discretion, levy fees at the original rate.

III. A licence in this form may be granted or renewed for any period not exceeding three years, and, if the period for which a licence is granted or renewed exceeds one year, the fee shall, subject to the proviso to clause (*ii*) in paragraph II, be levied at the annual rates hereinbefore prescribed for grant or renewal, as they case may be.

Serial number of licence.	Name, description and residence of licensee and agent, if any.	Arms or Ammunition that licensee is entitled to possess.		Retainers (if any) covered by the licence.					Extent of validity of licence, *i.e.*, throughout India, province or district.	Date on which licence expires unless previously ceasing to be in force under the proviso* to sub-rule (1) of rule 42.	Date on which the licence or the arms or both shall be produced for inspection before the licensing authority under sub-rule (1) of rule 42.
		Brief description of each weapon with details, *e.g.*, distinguishing marks, register No. etc.	Quantity and description of each kind of ammunition.	Name of retainer.	Name of retainer's father.	Address of retainer.	*Arms or ammunition that retainer is entitled to possess.*				
							As in column 3.	As in column 4.			
1	2	3	4	5	6	7	8	9	10	11	12

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Seal.

(Signature)

Commissioner
Deputy Commissioner of Police
Assistant Commissioner
District Magistrate of the District.
Sub-Divisional Magistrate of the District.

Form of renewal of licence

*Provided that where a licence is granted in Form XV, XVI, XVIII or XIX for the possession of arms to be acquired by the licensee subsequently to the grant of the licence, the authority granting the licence shall, at the time of granting the same, direct that within a period specified by him in this behalf which he may from time to time extend, the arms covered by the licence shall be acquired and that the licence or the arms or both shall be produced for his inspection, and if within the period so specified or extended the licensee fails to acquire the arms and to produce the licence or the arms or both, as the case may be, the licence shall cease to be in force.

Date and year.	Date on which renewed licence expires.	Signature of { Commissioner / Deputy Commissioner of Police / Assistant Commissioner / District Magistrate of the District. / Sub-Divisional Magistrate of the Sub-Division District. }

APPENDIX II.

CONDITIONS.

1. This licence is granted subject to all the provisions of the Indian Arms Act, 1878 and of the Indian Arms Rules, 1924.

2. The licensee shall not go armed with any arms covered by this licence otherwise than in good faith for the destruction or driving away of wild animals which do injury to the crops or cattle situated in the area specified in the licence.

3. He shall not use any arms covered by this licence otherwise than in the place or area in which the licence is valid.

4. He shall not lend any arms or ammunition covered by this licence to any person other than a member of his family, or servant who may be employed by him to protect the crops or cattle situated in the area specified in the licence and who is mentioned in column 2 of the licence.

5. He shall forthwith give information at the nearest police-station of the loss or theft of any arms covered by the licence.

6. The licensee shall not keep Government arms or ammunition.

Explanation.—For the purposes of this condition—

(*a*) "Government arm" means a firearm or other weapon which is the property of the Government; and

(*b*) "Government ammunition" means ammunition manufactured in any Government factory, or prepared for and supplied to Government.

7. Condition 6 may be cancelled by the authority granting the licence if empowered to do so by the local Government, and an endorsement added showing the Government arms and ammunition which the licensee is entitled to possess.

8. The licensee shall not purchase rifle, revolver or pistol ammunition in excess of the maximum which may from time to time be fixed by the local Government.

9. This licence shall be void if the licensee commits a breach of any of the above conditions or if the licensee dies, or if any weapon covered thereby—

(*i*) is sold,

(*ii*) is attached in execution of a decree.

10. The authority granting the licence has the right to inquire at any time during the currency of the licence whether any weapon for which it has been granted is still in the possession of the licensee and to require production of the weapon for the purposes of such inquiry.

NOTES—* A licence in this Form may be granted for any period not exceeding three years.

Any breach of the conditions of this licence is punishable with imprisonment for a term which may extend to six months or with fine which may extend to Rs. 500 or with both. (Section 21 of the Indian Arms Act, 1878.)

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APPENDIX II.

FREE OF ALL FEE.

FORM XIX.

(SEE RULE 36.)

Licence for the possession of arms and ammunition and for going armed for the destruction of wild animals doing injury to crops or cattle.

Name, description and residence of licensee.	Name and description of any member of the licensee's family, or servant employed to watch crops or cattle, residing with him, by whom the arms covered by this licence may be also used.	ARMS AND AMMUNITION.		Place or area within which the licence is valid.	*Period for which the licence is valid.
		Brief description of each weapon with details, *e.g.*, Registered No. and other distinguishing marks.	Quantity and description of each kind of ammunition.		
1	2	3	4	5	6

The ____ *of* ____ *193*

District Magistrate of the ____ *district.*
Sub-Divisional Magistrate ____ *district.*

FHL.35.
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PROCEEDINGS

of the

CATTLE CONFERENCE.

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1937

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Mr. E. A. GARLAND, Deputy Conservator of Forests.

Mr. MANEK LAL KESHAV LAL PATEL.

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Babu CHOTIALAL KANORIA.

United Provinces.

The Honourable Rai Bahadur Raja MAHESHWAR DYAL SETH, Minister of Revenue and Agriculture, United Provinces.

Mr. P. B. RICHARDS, I.A.S., Director of Agriculture, United Provinces,

Mr. T. S. DAVIES, Director of Veterinary Services, United Provinces.

Dr. SCHNEIDER of the Allahabad Agricultural Institute, Naini, Allahabad.

Mr. E. A. SMYTHIES, Conservator of Forests, Western Circle, United Provinces.

Punjab.

The Honourable Rao Bahadur Chaudhri Sir CHHOTU RAM, Minister for Development.

Mr. T. F. QUIRKE, M.R.C.V.S., I.V.S., Director, Veterinary Services, Punjab.

Chaudhri HANS RAJ SAINI, M.Sc. (Pb.), B.Sc. (Edin.), Fodder Specialist, Department of Agriculture, Punjab.

Khan Sahib Khawja GHULAM HASSAN, Retired Superintendent, Civil Veterinary Department, Punjab.

Sardar SANTOKH SINGH, B.A. (Oxon.), B.Sc. (Agri.), N.D.D.

Mr. L. W. SMITH, Superintendent, Cattle Farm, Hissar.

Mr. W. S. READ, Assistant Superintendent, Cattle Farm, Hissar.

Dr. R. MACLAGAN GORRIE, Silviculturist, Punjab.

Bihar.

The Honourable B. GUR SAHAY LAL, Minister-in-Charge of Agriculture and Animal Husbandry.

Mr. S. LALL, I.C.S., Secretary to the Government of Bihar, Education and Development Department.

Mr. D. R. SETHI, I.A.S., Director of Agriculture, Bihar.

Babu GANPATI MANDAL, Pleader.

Babu RAMLAKHAN SINGH, Member, District Board, Patna.

Major P. B. RILEY, Director, Civil Veterinary Services, Bihar.

Central Provinces.

The Honourable Mr. BALKRISHNA GANESH KHAPARDE, Minister for Forests, Central Provinces.

Mr. C. F. BELL, I.F.S., Chief Conservator of Forests, Central Provinces.

Mr. J. S. GAREWAL, Director of Veterinary Services, Central Provinces.

Mr. C. J. W. LILLIES, I.C.S., Secretary, Forest and Agricultural Department.

Rao Sahib UTTAMRAO PATIL.

Sir MADHORAO G. DESHPANDE, K.B.E.

Mr. J. V. TAKLEY, Livestock Expert.

Assam.

Mr. FAZLUL HAQUE, Deputy Director of Agriculture, Assam.

Mr. R. C. WOODFORD, Deputy Director of Agriculture, Livestock, Assam.

North-West Frontier Province.

The Honourable Khan Bahadur SAADULLA KHAN, Minister for Agriculture.

Lt.-Col. E. W. C. NOEL, Director of Agriculture.

Khan Sahib S. M. A. SHAH, Superintendent, Veterinary Department.

Mr. KHUSHAL KHAN of Barikab.

Khan Sahib GULAM HAIDAR KHAN of Sherpao.

Orissa.

The Honourable SRIMAN MANDHATA GORA CHAND PATNAIK MAHASAYO, Revenue and Education Minister.

Mr. S. N. MOZUMDAR, I.C.S., Development Director.

Sind.

The Honourable Mir BANDEH ALI KHAN TALPUR, Minister-in-Charge of Agriculture and Animal Husbandry, Sind.

Rao Sahib K. I. THADHANI, M.Sc., Director of Agriculture, Sind.

Khan Bahadur MUHAMMAD AYUB KHAN KHUHRO.

Khan Sahib ALLAH BAKHSH KHAN KHUDADAD KHAN GABOL.

Baluchistan.

Mr. A. M. MUSTAFA, Agricultural Officer, Baluchistan.

Khan Sahib N. K. VACHA, Deputy Superintendent, Civil Veterinary Department, Baluchistan.

Ajmer-Merwara.

M. MUHAMMAD SHAH NAWAZ KHAN, Divisional Forest Officer, Ajmer-Merwara.

Baroda State.

Mr. K. V. UPLAP, Naib Diwan, Baroda State.

Mr. R. G. ALLAN, M.A., C.I.E., Commissioner of Agriculture, Baroda State.

Bhopal State.

Mr. H. K. MEHRA, M.R.C.V.S., Veterinary Officer, Bhopal.

Gwalior State.

Rao Bahadur L. B. MULEY, Revenue Minister, Gwalior.

Mr. N. S. APTE, Offg. Director of Agriculture, Gwalior.

Hyderabad State.

Dr. B. K. BADAMI, G.B.V.C., Director, Veterinary Department.

Mr. NIZAMUDDIN HYDER, Director of Agriculture, Hyderabad.

Indore State.

Rao Sahib TAMBE, Revenue Minister, Indore.

Jodhpur State.

Khan Bahadur Nawab Chowdhry MOHAMMED DIN, Revenue Minister.

Dr. FERNANDEZ, Director, Animal Husbandry Department.

Kashmir State.

Mr. V. L. WAZIR, M.R.C.V.S., Superintendent, Civil Veterinary Department, Kashmir.

Patiala State.

Sardar JARMANI DAS, Secretary, Forest Department.

Captain A. H. SADIQ, Director of Agriculture.

Travancore State.

Mr. K. R. NARAYANA IYER, B.A., M.Sc., F.C.S., Director of Agriculture and Fisheries, Travancore.

AGENDA.

1. The setting up of suitable provincial cattle improvement funds on the lines suggested by the Animal Husbandry Wing of the Board of Agriculture as the best means of following up His Excellency the Viceroy's campaign for providing breeding bulls.

2. The improvement of grass lands and the better utilisation of waste and surplus land for fodder production and the initial steps to be taken in that direction by the various appropriate agencies.

3. The need for increased technical personnel required for livestock improvement work throughout India.

4. The possibility of crop planning for increased fodder production with special reference to leguminous fodders.

PROCEEDINGS OF THE CATTLE CONFERENCE.

The Conference assembled in the Council of State Chamber, Simla, at 11-30 A.M. on Tuesday, the 25th May 1937.

The Hon'ble Kunwar Sir Jagdish Prasad in requesting His Excellency the Viceroy to open the Conference said :

Your Excellency,

It is my happy privilege to extend to Your Excellency a warm welcome to this conference of Hon'ble Ministers from Provinces, representatives of the Government of India and of Indian States, technical experts and distinguished non-officials who are assembled for the purpose of concerting measures for the improvement of Indian livestock. This is a subject to which Your Excellency has given much needed prominence both by noble precept and praiseworthy example. In Your Excellency's first message to the people of India as Viceroy, Your Excellency gave a vivid picture of the whole problem in a memorable phrase : " The cow and the working bullock carry on their patient backs the whole structure of Indian agriculture ". Then followed the presentation by Your Excellency of pedigree bulls to the Delhi Province—an example which appealed to the sentiment and touched the imagination of the Indian people and which found ready response throughout the country. At a later stage, Your Excellency drew pointed attention to the need for the preservation of cows of well-known breeds after their lactation period was over, by the salvage of dry cows from Calcutta and their presentation to the Delhi Pinjrapole. Your Excellency's keen and informed interest in this vital matter of animal husbandry has stimulated public opinion, has encouraged effort and has heartened those who have been labouring patiently in this important field. Your Excellency, in a country where religious sentiment, dietetic needs and agricultural requirements all combine to make the improvement of livestock a matter of national importance, it is a depressing reflection that abstract veneration should only yield such practical neglect. Some of the malpractices to which our cows are subjected in cities in order to prolong their lactation period are a blot on our humanity, and it is about time that public opinion so asserted itself as to make such practices impossible. The law by itself is powerless to stop the evil-doer. Nor can we look with any satisfaction or pride on the vast numbers of lean, hungry and underbred cattle that encumber the countryside. It is clear that passive sentiment alone is ineffective to deal with a problem which requires for its

proper solution scientific knowledge, efficient organisation and a consistent policy pursued with vigour over a number of years to achieve well-defined objectives. We need advice and guidance not only in regard to the methods of breeding but also in regard to the all-important question of an adequate supply of good fodder as well as in regard to the prevention and cure of disease and in regard to the most efficient form of administrative machinery. Some of these vital problems will engage the attention of this Conference and I need say no more about them at this stage.

Your Excellency, I need hardly add that much good work has been done in the past both in the Provinces, in States and at the Centre and the pace has appreciably quickened as the result of the recommendations of the Agricultural Commission, over which Your Excellency presided. A notable step forward was taken by the appointment of an expert adviser in animal husbandry to the Imperial Council of Agricultural Research in 1930, and I should like to take this opportunity of acknowledging the valuable services which Colonel Sir Arthur Olver has rendered to the advancement of animal husbandry and which have been recently recognised by the conferment on him of a Knighthood. Nor should I fail to mention the excellent work that the Imperial Veterinary Research Institute at Muktesar has done in investigations into animal diseases and in their prevention and cure under the able direction of Mr. Ware, whose good work has won for him a well-merited C.I.E. The Institute has been recently reorganised and the staff strengthened. We also hope soon to have well-equipped sections for animal nutrition and poultry research at Izatnagar in the Bareilly District of the United Provinces. But while a good deal has been done, it will be generally admitted that much yet remains to be accomplished. It is, for example, a little anomalous that in a predominantly agricultural country like ours, there is at present no provision for higher courses in veterinary science. We have to send our young men abroad for such training. I hope that it may be possible to remedy this defect in the not distant future, so that teaching up to the highest grade may be available in this country. We have also to secure that the methods that we recommend for cattle improvement reach the man in the village and are accepted and utilised by him, for without his willing co-operation little progress can be made. To ensure this, our administrative arrangements should be so devised as to establish the closest contact with the rural population.

Your Excellency, I need hardly emphasise the need for and the importance of a conference of this kind. It provides an opportunity for the exchange of ideas and the interchange of experience. It brings experts and laymen together. It enables Provincial Ministers to get a general view of the problem as a whole and it enables the Government

of India to realise the varying needs and circumstances of Provinces and States. It will also provide, I hope, a corrective against shifting policy and haphazard methods. It is a happy augury for the success of this very representative Conference that Your Excellency has, in spite of the pressure of a other engagements, graciously agreed to open it, giving one more proof, if proof were now needed, of Your Excellency's abiding and vigilant regard for all that touches the well-being of the agricultural classes. It is our earnest hope that work begun today, which is untouched by political controversy, may yield results of permanent value and that Your Excellency's Viceroyalty may come to be regarded in the chronicles of the future as the golden age of Indian agriculture. I have now the honour to request Your Excellency to be pleased to open the Conference.

HIS EXCELLENCY THE VICEROY'S SPEECH AT THE OPENING OF THE CATTLE CONFERENCE ON TUESDAY, THE 25TH MAY 1937.

Gentlemen,—

Let me first of all assure you how happy I am to welcome you all to this Conference and to the Headquarters of my Government. And let me thank you, Sir Jagdish Prasad, for the speech to which we have just listened, and for the kind words which you were good enough to use about myself and my interest in agricultural advancement.

The purpose of this gathering is that we may take counsel together upon the question of what may best be done in order to promote an early improvement and development of the livestock industry throughout India—in other words, to consider what practical steps can be taken to secure the better breeding and feeding of Indian cattle.

The subjects with which this Conference is concerned have for many years lain within the Provincial sphere of administration. The opportunities for service open to the Central Government are now in the main limited to the fields of specialised instruction, research and the control and prevention of animal diseases. It is also the duty of the Centre to promote the exchange of information between Province and Province and to provide, from time to time, opportunity for the discussion of important problems and for the interchange of views, of which the present occasion is, I venture to think, a happy example. And let me hasten to add that not the least valuable outcome of such a gathering as this is that it affords guidance to the Central Government as to the manner in which it can best serve the requirements of the whole country. Acting upon the advice of the Imperial Council of Agricultural Research

and of the Board of Agriculture and Animal Husbandry in India, our equipment for this work has recently been extended by the strengthening of the central institution for animal research, while—as Sir Jagdish Prasad has told you—our proposals for a central institution for higher veterinary instruction are now assuming definite shape.

Gentlemen, it is not necessary that I should remind an audience such as this that the ox is the foundation of India's agriculture. Indeed, I am aware of no other single contribution which it lies within our power to make towards the enhancement of the agricultural wealth of this country which, in its potential value, is in any degree comparable with the general improvement of livestock. It has been calculated that the total annual cash value of livestock in India, if we include the annual value of cattle labour, dairy produce, manure and other products, is of the order of 1,300 crores of rupees. That no doubt is an approximate figure, but it serves at least to indicate the immense values at issue, and the scope afforded in this direction for the enhancement of the country's wealth.

And here let me say that, while cattle must be the chief concern of this meeting, many of the proposals which may result from your deliberations will be applicable to other branches of the industry such as sheep and goat breeding, both, in my opinion, deserving of and certain to repay, in full measure, the early attention of the departments concerned ; while wool production, the hides and skin industry, and, in some Provinces, horse breeding may well derive benefit as a consequence of your labours.

It is impossible to overstate the importance to the agriculturists of India of an adequate supply of good working bullocks. For the bullock provides practically the sole source of power available to the cultivator, whether for cultivation, for transport, or for the lifting of irrigation water. Nor need I emphasize the value of cattle manure or the importance of the place which cattle dung used as fuel still holds in the domestic economy of a large proportion of the rural population, much as we may regret that fact.

The great importance of milk production, whether produced by the cow or the buffalo, from the point of view of the country at large as well as from that of the cultivator himself, is now widely recognized. The facts as regards the average consumption of milk and milk products per head of the population, so far as these are at present available, go to show that, while there is great variation in this matter as between region and region and between household and household even in the same village, there is no doubt that the average consumption of dairy

produce is too low, more particularly when it is remembered that we are dealing with a country in which the diet of human beings is so largely vegetarian, and in which there is therefore a special need for such protective animal foods as milk, *ghi*, and curds. In this matter of developing the production and distribution of milk and milk-products, we look forward to the report of Dr. N. C. Wright, Director of the Hannah Dairy Research Institute, who recently spent five months in India examining our problems.

For the development on sound lines of animal husbandry as a whole and the cattle industry in particular, a scientific foundation is required, and the Central Government have recently given special consideration to the requirements of the country in this respect. Additions have been made to the Imperial Veterinary Research Institute, and well-equipped sections for animal nutrition and poultry research have been provided at the Izatnagar branch of the Institute. When the section on animal genetics has been added, the institute will compare favourably with similar institutes in other parts of the world. The function of a central institute of this kind is to promote cattle improvement and the control of diseases in the Provinces and throughout India. But it will at once be obvious that unless suitable organisations exist in the Provinces which are capable of co-operating fully with the experts maintained at central institutions, much of the labour at the centre may be wasted and the ryot will fail to obtain the full measure of help which he needs. As I have already said, this is a Provincial question and each Province has its own special requirements and limitations, but it seems desirable that we should take counsel together in this all-important matter, for it is abundantly clear that, if anything adequate is to be done for the improvement of cattle in India, more technical staff of every grade is needed and, above all, continuity in breeding policy.

I am indeed glad to tell you that the response to my appeal for breeding bulls and for funds with which to purchase and maintain them has been highly gratifying. The position at present is that, in addition to a number of collective donations, as many as 1,073 individuals have responded to my appeal with donations of either animals or money. No fewer than 1,322 bulls have been presented or promised, while the cash subscriptions which have been offered amount in all to no less a sum than Rs. 1,65,000. In addition a sum of Rs. 1,000 has been received for the rescue of valuable animals from city byres. This response has been a very great encouragement to me, for I am convinced that better sires must be the foundation of our policy of breed improvement. But let me remind you that better bulls can only be the first step. It is essential, if real and lasting benefits are to accrue, that the bulls should be adequately maintained. The question of opening a Cattle Improvement

Fund in each Province is, therefore, a matter in which I take the keenest interest. The purpose of these organisations would be the provision of adequate financial resources, the creation of an organisation devoted to the proper care and maintenance of all approved stud bulls ; and ultimately, I hope, the provision of further suitable animals.

The art of breed improvement must inevitably be founded upon the accurate recording of pedigrees. The Imperial Council of Agricultural Research, with the co-operation of the appropriate Provincial Departments, has undertaken the establishment of pedigree herd books for the principal milch cow breeds of India and as a first step has set up a small committee for the definition of breed characteristics. This is a type of work which I greatly hope may be much more fully developed provincially, not only by the establishment of provincial pedigree herd books for the most important draught breeds, but also by a more extensive system of registration of all the stock produced from "Gift" and other good sires. The fact must be faced that, laborious as such registration may be, it is essential if the continuous improvement of Indian cattle is to be secured. Without registration of progeny, and of their performances, even a very extensive system of distribution of stud bulls may easily fail to make any lasting impression on the cattle of the country. Method well devised and faithfully pursued through a long series of years is essential to the achievement of complete success.

Let me at this stage assure you that I have at all times in mind the excellent work on cattle breeding that has already been carried out, mainly by provincial departments—work which in many districts has already yielded a rich return in the shape of a general improvement in the local breeds.

Unless cows, calves and bullocks are to be fed better than is at present the case, efforts to improve breeding will obviously be of little avail, and I am glad to note that two of the four items on the agenda of this Conference deal with this aspect of cattle improvement. The provision of better grazing and the greater production of suitable fodder crops are two separate but closely related aspects of this great problem. The former was discussed at length by the Board of Agriculture and Animal Husbandry at Madras last December, their task being greatly lightened by the labours of a most important preliminary conference of Forest Officers which has done much to clarify the position as regards forest grazing and the utilization of waste land. The Board have made some important recommendations both as to the better utilization of existing grazing areas and the possibility of converting land at present waste into useful pastures. In this connection it is my personal opinion that further research and experimental work on the

grasses of India, and the possibility of acclimatizing useful exotic fodder grasses, are matters deserving of early attention. India is not a pastoral country as judged by the usual standards of temperate climates. Nevertheless the improvement of the grazing lands, and an increase in their extent, might do much to raise the general standard of the working cattle of the country. In most areas however the grazing must be supplemented by other foods and for the actual feeding of a very large percentage of our animals we must depend on the straws of cereal crops and on fodder crops. The time has come when there must be deliberate crop-planning for increased fodder crop production. Without anticipating the discussion on this subject, it may be said that, if the additional resources placed at the cultivators' disposal by improved varieties of staple crops and by improved irrigation facilities are wisely used, there is scope for a much larger production of fodder crops, especially leguminous crops, in a manner which would mean a gradual and steady rise in the efficiency of the cultivator and his cattle. The proposal of the Board of Agriculture and Animal Husbandry that each Province should set up a grazing and fodder committee linked up with a central subcommittee under the Imperial Council of Agricultural Research will be submitted for your consideration as a practical way of making a start and at the same time of arranging for an interchange of information and experience. I cannot overstate my sense of the vital importance to India of this question of animal nutrition, for I believe it to be true to say that an essential step towards the better nourishment of man must be to improve the food supply of his animals.

Let me end as I began by affirming my profound conviction that we can make no greater contribution towards the welfare of the cultivator than by promoting the improvement of cattle throughout India. Let me also assure you that success in this endeavour is within our reach and competence,—technically, administratively and financially, if we can but come to a right policy and if we persist in our endeavours. Public opinion and the enthusiasm of the agriculturists are with us in no uncertain measure. Let us devote ourselves to this great purpose with high courage and unswerving devotion. I am confident that you, by your labours in this Conference, will make a most material contribution towards the advancement of Animal Husbandry in India, and I leave you now to your arduous labours. (Applause.)

His Excellency then withdrew.

After H. E. the Viceroy left the Chamber, the Honourable Kunwar Sir Jagdish Prasad occupied the Chair.

Chairman : The first item on the agenda is the setting up of suitable provincial cattle improvement funds on the lines suggested by

the Animal Husbandry Wing of the Board of Agriculture as the best means of following up His Excellency the Viceroy's campaign for providing breeding bulls. I would first call upon Sir Bryce Burt to explain the position.

Sir Bryce Burt : Sir, after what has been so eloquently said by His Excellency the Viceroy and yourself, there is no need for any preamble, and if I may I would like to at once try to summarise the main points on which we would like to try and take decisions on subject No. I. The question before us was very carefully considered at the Board of the Animal Husbandry Wing held at Madras in December last, and the general conclusions reached are summarised in the paper before the conference. It was found that there was a general view that some suitable provincial organization should be set up and a provincial cattle improvement fund started. The Board have in mind an organization which would be largely non-official in character and which would see that the money available is applied to the best advantage. Briefly, the position in various provinces is as follows. In Madras, there is already a proposal to start such a central fund. In Bombay the need for such a fund has already become obvious and one is under consideration. In the United Provinces there is already a provincial cattle board, with district cattle improvement committees, to which the donations have been allotted. In the Punjab it has been possible to place the gift money at the disposal of the District Boards to supplement their normal activities in cattle improvement matters. In Bihar and in the C. P. provincial cattle breeding associations have been established. In Orissa also a cattle breeding society has been formed, of which H. E. the Governor, is the President. A proposal is under consideration for the establishment of a cattle breeding association in Assam. In the N.-W. F. P. the additional funds obtained have been used to supplement the departmental bull subsidy scheme. That, Sir, is the summary of the position, so far as we are aware, at the present moment.

Sir, it will be seen that in most provinces there is already a move towards a provincial cattle improvement fund and some form of provincial organization. Here I would say that we all trust that the response to this appeal will continue and grow and that the establishment of definite provincial organizations will provide an added stimulus to private generosity. One suggestion which occurs to me is that if one could start an annual cattle improvement day annually on which each member of the population would contribute a minimum of one pice, one would obtain funds for the cattle improvement far beyond present expectations.

A matter which merits the special consideration of the conference is the form which provincial organizations should take. In some instances provincial advisory boards appear to be doing good work, as they advise on the cattle breeding policy of the province, are in close touch with live-stock officers and have a say in the utilisation of funds provided by Government. Such boards could appropriately advise on the uses to which a provincial fund should be put. In other instances, the trend appears to be towards independent associations actually controlling the funds created by private donations. There is much to be said for each form of organization and this is a matter on which a free exchange of opinions

would be very helpful. Whichever form of organization is adopted, the question of its relations with the Ministry of Agriculture will need very careful consideration. Whatever the membership of the board or association, it is clearly desirable that it should include the expert officials of the Provincial Departments concerned with livestock improvement.

There are thus three main points for our consideration—(1) the establishment of cattle improvement funds, (2) the nature of the provincial organization for the administration of that fund, and (3) its relationship to the several Ministries of Agriculture and to the expert officers concerned with livestock improvement.

Chairman : Would any member now like to start the discussion ?

The Hon'ble Rao Bahadur M. C. Rajah (Madras) : Sir, before I begin to say what the Madras Government propose to do with reference to this fund, I should like to clear a misstatement of fact. Sir Bryce Burt just said in his speech that there is already a proposal in Madras to start a fund, and when he said that I suppose he referred to para. 5 of the Note by the Imperial Council of Agricultural Research. It is stated there that there is a proposal to start a fund in Madras, but that is a misstatement of fact. It is said in the Note that in Madras it is proposed to start a central fund out of donations received and that this fund would be dealt with by the Provincial Economic Council and distributed as required to District Board. I am given to understand that a suggestion somewhat to this effect was made at the Animal Husbandry Wing held at Madras in December last. But it was a mere suggestion. It rather expressed a fond hope of Mr. Littlewood and nothing more. But that hope has not been realised. The response in Madras to H. E. the Viceroy's appeal has been disappointing. There have been only 28 instances of presentation of stud bulls and the total amount donated was only a little over Rs. 3,000. We have not lost hope and propose to make another attempt. But we would also appeal to the Government of India for some substantial contribution to our fund.

Cattle breeding, however, I must say, is a very slow process. We already have a Cattle Farm at Hosur with over 600 heads of cattle costing over Rs. 1 lakh a year. We have proposals in hand to start a buffaloe farm at Prattur on the right bank of the Kistna River and a farm for Ongoles at Lam near Guntur and we are hoping to start the first during the current year and the second in 1938-39 provided of course funds are available. But I am afraid these cattle farms will take a long time to make an impression on the livestock of the country.

In the meantime, however, we are doing what we can to expedite the process. We have a premium scheme in Madras. We also have a " grant " scheme. Under the " premium " scheme, the Government encourage private individuals or institutions to purchase and maintain breeding bulls of approved type. The premium paid is Rs. 100 (Rs. 50 for maintenance and Rs. 50 for service). There are 108 stud bulls now maintained in the Presidency under this scheme. Under the " grant " scheme, the Government instead of paying premia make a consolidated grant to District Boards to cover roughly half the cost of purchase of bulls. The

District Boards distribute the bulls among the ryots for care and maintenance subject to certain rules regarding service and maintenance of registers. If the ryots follow the rules for a period of 2 years, the bulls become their property. Government are paying the District Board of Coimbatore a sum of Rs. 2,000 for 3 years for purchase of 20 breeding bulls per year. They have also promised to pay Rs. 750 per annum for 2 years to the same Board for purchasing 5 Sindhi bulls and 5 Delhi buffaloe bulls per year. A grant of Rs. 1,200 per annum for 3 years has been sanctioned for the West Tanjore District Board for purchase of 12 bulls per year. A grant of Rs. 1,200 has been sanctioned to the Chingleput District Board for purchase of 12 bulls. We have also recently allowed some 140 Co-operative Societies to buy a stud bull each from their Common Benefit Fund and have directed the Agricultural Department to pay premia in respect of these bulls. A cattle breeding co-operative society will shortly be started with 15 stud bulls in the Hallikar area in the Salem District. We expect that these measures would shortly provide a fairly large number of stud bulls in the country.

Our immediate difficulty, however, as observed in the I. C. A. R.'s note is that there is no provision now for the care and maintenance of the bulls donated by private individuals in response to H. E. the Viceroy's appeal. In fact, the 28 stud bulls donated in most cases continue to be in the custody of the donors themselves. It is to meet this difficulty that the I. C. A. R. has suggested a central fund. It occurs to me that a possible line of approach would be to rouse local interest in livestock improvement. In South Kanara district a Livestock Improvement Association has actually been started within the past one year. The donations made in response to H. E. the Viceroy's appeal have been collected by the Association. If we succeed in starting similar associations in each district, they might take over the care and maintenance of these bulls. I propose to have this possibility also examined.

The Hon'ble Chaudhuri Sir Chhotu Ram : Mr. Chairman, so far as the general question of policy is concerned, the Punjab Government is entirely at one with the proposal that has been put forward for the establishment of a Cattle Improvement Fund. But while the Punjab is prepared to accept the proposal in principle, we very clearly realise the limiting factor in the way of finances. I know from personal knowledge, both as a member of the District Board, and as a former member and also a present member of the Punjab Government, that finances have always been a very sore factor with regard to the improvement of cattle. I remember that we used to spend about Rs. 30,000 a year in the way of grants to District Boards. That was in 1924-25. We increased this grant later on to about a maximum limit of Rs. 50,000 for the Hariana breed and about Rs. 24,000 I believe in respect of another noted breed of the Punjab. When the depression came we had practically to stop these grants and I think just at present the aggregate of these grants is about Rs. 15,000. In the next budget we are going to raise this grant to Rs. 36,000 in the case of Dhanni breed but nothing so far has been contemplated in the way of an addition to the improvement of the Hariana breed. However, on the whole, the Punjab has been doing a good deal more than almost any other province I am sure. For instance, we are maintaining a very big farm at Hissar, the area is over

40,000 acres, and the head of cattle is in the neighbourhood of 10,000. This farm is costing us between Rs. 2 to 3 lakhs a year. Over and above this farm we have about four or five farms which are being maintained by private gentlemen on lands granted by the provincial Government to them on cattle breeding conditions. The total area of these private farms is, roughly speaking, about 28,000 acres. In addition to the big farm at Hissar and the four or five private farms we have been doing something in the way of encouraging private owners of animals of good breed. We are giving stipends at the rate of Rs. 3 per cow or per bull in the Dhanni Tract. In the current year our bill on this score will come up to 6,000. Then we have also tried the experiment of holding one day cattle shows in various chosen centres in the cattle producing districts.

So far as the actual response to the Viceroy's appeal is concerned, we are not fully satisfied with it, but I am glad to say that the response in the Punjab is far better than that in Madras. We have received donations of 588 bulls by private donors. The Punjab Government itself has done a good deal in the way of supplying stud bulls at very much reduced rates. The usual price of a Hissar stud bull is I believe Rs. 400, and we are at present giving away bulls at a price of Rs. 100 for young calves of about 3 years. Now, the number of bulls issued so far from the cattle farm at Hissar is 6,000. That is a fairly large number and if we are allowed by our finances to expand our activities in Hissar we propose to raise the annual supply to 1,000 bulls. At the present moment we are not in a position to supply more than 600 a year. The present available supply at the farm is 700. We may be able to raise this number to 1,000 provided we are in a position to make a better provision in the budget, of which I do not see many chances. So, I support the request which has been made by the Hon'ble Mr. M. C. Rajah that if the Government of India wishes that cattle improvement should make any real headway, it should come to the rescue of the provincial finances. As you are aware, the sources of provincial revenues are very much limited, and unfortunately, they are not capable of expansion. All the sources of revenue which have been allocated to the provinces are inelastic and rigid. Therefore, so long as we are unable to get hold of sources which will respond to an increased demand easily, we should receive very generous help from the central revenues.

It will also interest the Conference to know what the Punjab has been spending on cattle breeding every year. Our avarage is a little more than 20 lakhs a year, a figure which will compare very favourably with the amount that is being spent by any other province in India.

The Hon'ble Mr. B. Gur Sahay Lal (Bihar) : The importance of provincial funds cannot be over-estimated, but the whole question is that there should be a permanent fund in order to carry out this propaganda and this work. His Excellency the Viceroy's appeal has had some response in my province also, but that is not at all satisfactory, and I support my friend the Hon'ble Mr. Rajah in his plea that there should be a permanent fund from the Central Government in order to carry out

this improvement. As soon as this fund is available, then some improvement can be made and a central association can be created. Under that central association there should be district associations. The breeding of bulls may be centralised in the province and the actual details will be explained by my Secretary, Mr. Lal, in this connection. I have spoken generally on the question and I support the appeal for contribution to our fund.

The Hon'ble Sriman Mandhata Gora Chand Patnaik Mahasayo (Orissa) : I come from Orissa, and as you know, it is a very poor province, a very backward province. The tail ends of three different provinces were placed together to form this Orissa province, and therefore we have all the disadvantages of the three different provinces. My Honourable friend. Mr. Rajah said that Madras is at a disadvantage, but I may say we have the worst disadvantage of Madras. The Hon'ble Minister from Bihar said that Bihar is at a disadvantage. Being the tail end of Bihar on one side we have the worst disadvantage of Bihar. So far as I know, milk is not available in many parts of the province for even children. The state of things is very, very backward and the little that has been done cannot be said to be adequate in any way to improve the condition in Orissa. Therefore, the first thing that we have to see is whether the Government can afford to spend any money at all. We are a deficit province and we get a subsidy of Rs. 40 lakhs a year from the Government of India, and out of this sum, for some reason or other, for services rendered or supposed to be rendered the other provinces take a large portion. We are left with practically nothing which we can spend on ameliorative measures. We cannot cut down the services that we have to maintain, we cannot reduce the salaries or anything like that, and those salaries have to be paid. Therefore, we are left with practically nothing to spend on ameliorative measures. Again, there are very few zamindars who hold impartible estates in certain parts of the province. One of them has his income pledged to the extent of one lakh to the Andhra University and we cannot expect to get anything from the Maharajah of Jeypore. There is the Maharajah of Parlakimedi, he is doing something in this direction, but the little that he is doing is not sufficient to ameliorate the condition of the people. The other zemindars, of course, cannot be expected to do much. There is a class of temporarily settled estates, which I would say are owned by persons who are neither zemindars nor ryots, and very many of these estates come up for sale every time kist has got to be paid, and the sooner that class disappears the better for the province, for themselves and for the ryots. Then we have got permanetly settled estates in north Orissa and most of them are owned by people who have their homes in other provinces. Therefore, they do very little to improve the condition of the people of Orissa. These are the conditions under which Orissa is now placed, and if you do not take these into consideration, you may exclude us altogether from the scope of the activities of this association or any other association of this kind. I appeal to you strongly to do what you can for the improvement of Orissa. Our problems are unique. We have the disadvantages of three provinces. You must take into consideration all these facts and do something to improve the condition of the people and cattle also there. Unless the Government of

India comes forward to do something for us, the Orissa Government can do very little to improve the condition of the people.

The Hon'ble D. B. Sir S. T. Kambli (Bombay) : Sir, I shall tell the Conference what the Government of Bombay has been doing in the matter of cattle improvement. The Government of Bombay has been maintaining 5 Government cattle breeding farms in various parts of the Presidency and also they are subsidizing four private cattle breeding associations as well. The five Government farms are situated at Chharodi, Surat, Tegur and Bankapur and one at the Agricultural College at Poona and the four private associations are situated at Jalgaon, Jemner, Sangoi and Khandivalee. We have been putting out premium bulls for service in various parts of the presidency. The total number of such bulls we put out number 280. They are given to the villagers under certain conditions. That is the position in Bombay.

Now, Sir, coming to His Excellency the Viceroy's appeal and the response to it in the Bombay Presidency : We received a sum of roughly Rs. 61,000 in response to this appeal and also 28 bulls were received in response to this appeal. Looking to the total amount which the appeal has brought, I think Bombay has given a very good account of itself. We have received 61,000 out of a total of 1,65,000 or so for the whole of India. One important point arises in connection with the donations made by the various people and associations in the Bombay Presidency. Most people who have donated either bulls or money have done so on the express condition that the bulls or the money which they have donated should be utilised or spent in their respective districts. Local interests seem to be the main guiding factor in making these donations. Another difficulty seems to confront the Bombay Presidency in utilising this money. We have purchased about 40 bulls by spending Rs. 8,000 out of the 61,000 received by way of contribution from the people. The question is how to maintain these animals. Our invevstigation has shown us that a very large number of selected villagers will come forward to maintain these animals out of their own monies for three years provided they become the absolute owners of these bulls after the period of three years. Otherwise the Govvernment shall have to pay the maintenance charges for each one of these bulls. We should therefore take advantage of the offer of the villagers in this respect.

Sir, I think we should take note of this desire of the people to spend money in their own districts and therefore what I do suggest is this. There should be a provincial cattle improvement association with district branches largely devoted to the collection of funds and the administration of those funds in their own districts. What the provincial cattle improvement association and the funds of that association should do is to co-ordinate the activities of these various district associations and also spend the money which they have collected for the province by subsidizing those districts where the response is poor or where efficient work could be more usefully done.

Sir, we have heard tales of financial woe from the various provinces. Obviously the financial position of Provinces is not satisfactory. The

Provinces stand in need of financial help from the Central Government. I therefore appeal to the Government of India to set apart one crore of rupees to be distributed to the various provinces to serve as a nucleus for the provincial fund. This will not be a very big thing. Looking to the interest that the Viceroy has been taking in this matter, looking to the larger interests of the cultivator and to the benefit to agriculture in India as a whole, I think the appeal which I make to the Government of India will not be made in vain. I want a crore of rupees to be set apart from the revenues of the Government of India to be distributed to the various provinces, so that this help from the Government of India will stimulate local interest and generosity of private persons and will go a long way in making this work a success. Otherwise I am afraid the work hitherto done will continue to be done with very little progressive efficiency. If you want to make a thorough success of this scheme, which I hope is the intention of everyone assembled here, then I do appeal to the Government of India to set aside a crore of rupees to be distributed to the various provinces in certain proportions. It will serve as a nucleus to the provincial fund. It will stimulate private effort and local generosity and will also give a great impetus to the work which we have in view.

The Hon'ble Rai Bahadur Raja Maheshwar Dyal Seth (United Provinces) : The Minister for Development from Madras started the discussion with a note of correction in the note put up by the Imperial Council of Agricultural Research. I am afraid I have got to do the same. I find this on page 2 of the note : (Hear the Minister quoted a sentence). As a matter of fact there are no such committees at present and there is no provincial board. I will tell you what we in the U. P. contemplate doing. It is proposed to organise in each district a district cattle improvement committee. The district officer will be the Chairman and every district official and all non-officials interested in the movement will be members to assist him in this great task. The Committee will include representatives from village cattle improvement committees and will be so constituted as to give as wide a representation to the cattle and livestock interests of the district as possible. The Committee will advise Government in regard to the livestock schemes, to assist in their supervision and to do everything in their power to promote the development of the livestock industries. From the district cattle breeding committees of the province, it is proposed to constitute a provincial cattle breeding board composed of officials and influential and well-informed practical men capable of representing cattle breeding and other livestock interests of the province. It is proposed that the Board should consist of two members selected from the district cattle breeding committees of each revenue division, 16 in all in U. P., two members of the Legislative Assembly nominated by the Government and two elected by the Assembly, the Senior member of the Board of Revenue, the Director of Agriculture, the Registrar of Co-operative Societies, the Director of Veterinary Service, the Deputy Director of Agriculture will be *ex-officio* members. The Personal Assistant to the Director of Agriculture will be the Secretary of this Provincial Board. The senior member of the Board of Revenue will be the President and a non-official member of the Board will be elected Vice-President. The Board will consist of 25 members and a

Secretary. Such an organisation will ensure the active and financial co-operation of all zamindars and agricultural leaders interested in the development of these industries throughout the province and cannot fail to give practical effect to the express wishes of His Excellency the Viceroy. Having told you in brief what we propose doing, I shall tell you what we have actually done so far for the improvement of cattle breeding in U. P. We have four cattle breeding farms from which we have a free supply of stud bulls all over the province and we have actually supplied a little over 5,000 bulls to the villagers for cattle breeding purposes. Our scheme is that out of approximately an expenditure of Rs. 80 on each bull, Rs. 22 has to come from the villagers themselves or from any individual. The rest is met by the Government out of a grant of Rs. 25 thousand a year which the U. P. Government makes for this purpose. This is over and above the free supply of bulls from our four breeding farms in U. P. Our total expenditure on these cattle breeding farms in U. P. is over a lakh and 50,000 but this solves only a part of the problem. It has been estimated that we actually require about 3,000 bulls a year for at least 12 years to come before we can solve this problem to any satisfactory extent. The Government of the U. P. certainly proposes to increase its grant towards the purchase of bulls from Rs. 25,000 to Rs. 50,000 this year and it may be more next year. Here I think there is no use in my indulging in the fruitless task of making a request to the Government of India to come to our aid but as my Honourable colleagues from other provinces have made this request, I feel certain that if it is granted the U. P. will certainly get a share of it. The question of the maintenance of these bulls in the U. P. is a very ordinary one and it does not require any serious efforts to solve it. Our bulls in the U. P. have a right of free grazing and they are looked upon by the villagers as a sort of local and national institution. They graze freely and I think on the whole they are in excellent condition. Wherever they are diseased or out of use, one man in each village who is supposed to be responsible for these bulls reports to the nearest Veterinary or Agricultural officer, whoever he may be, and the bull is taken back and a new bull supplied. The question of maintenance therefore does not arise in the U. P. but the main problem of supplying a large number of stud bulls remains to be solved. There is another problem. Supposing the funds are available, it is rather difficult to get a large number of good stud bulls either from our own province or from outside and for that purpose I think the cattle breeding farms will have to be increased before we can get the proper supply which we require for our purposes. Some suggestions have also been made in this note by the I. C. A. R. but it appears to me personally that this is in too advanced a stage. At the moment our problem is to get a supply of good stud bulls to the villagers and in concentrating our attention on intensive development in some districts. The whole province is too big an area to tackle this problem seriously and at any rate the catte breeding must take a few generations before we can have an improved variety of bulls. The supervision of its organization, of which I have talked just now, in the village divisions must devolve on the Collector or the Deputy Commissioner, who will be assisted by the non-official gentlemen of the district interested in the movement. With regard to our response to the Viceroy's appeal, I do not know if I said it has been rather good or bad, but to tell you the truth, the actual figure is only a little over Rs. 5,000. Certainly this sum is too small to tackle the problem on any serious basis, but with the interest that is growing in this

movement, thanks to the initiative given by His Excellency the Viceroy and the great personal interest which he takes in the matter and the interest which is being taken by the bigger *taluqdars* and *zamindars* of the United Provinces, and the extra funds which are going to be provided by the Provincial Governments for this purpose, I think, we will certainly solve this problem in the United Provinces. Later on, when we have developed this sphere of activity, will be the time to tackle such problems as the registration of the progeny of bulls or the recording of milk wherever milch-breeders are available. Work on these advanced lines is certainly going on in some part of the province, for example, in the Muttra district where we have organized a supply of a little over 200 Hissar bulls and we are having proper registers of the kind suggested by the I. C. A. R., but I would simply say this that it is not possible to do it on a large scale and we must concentrate our attention on a limited area while trying to supply good stud bulls all over the province.

The Honourable Mr. B. G. Khaparde : Sir, we are a small province and I think you will be right in expecting that my speech also should comparatively be a small one. I shall state in brief the position we have in our province but before I do so I should like to say that we are in complete accord with what is being done in this matter by the Central Government and the appeal of the Viceroy has not fallen on deaf ears in our province and we have been doing all we possibly can do according to our means to help this propaganda and the purpose in view. We have 289 bulls purchased as a result of the Viceroy's gift to our province. 103 bulls have been secured from Government grant, and 187 by donation from private persons ; so you will be able to see that we have done a great deal in this way. Then, private donations have been coming forward. I cannot say that these have been coming forward grudgingly but there has been more than one fund in our province that is being collected and this fund alone could not impel all the donors to do their best in this behalf. We have established an association in our province to help in the improvement of the livestock. At present the response for funds, as I said, has not been very generous but I hope, as time passes, and the benefits of this scheme are realized, that a more generous response will come forward. The Government in our province are going to publish a programme of work. After I left my province perhaps the programme has been published by now ; if it has not been published by now, I think it will be very shortly. In that programme we are providing for the establishment of a cattle breeding farm at a place called Davar (?) in Saugar district. The initial cost of establishing this farm for the first year would be Rs. 30,000. For the next year it is expected to be Rs. 47,000 and the recurring cost of the maintenance of this farm is expected to be Rs. 16,000. I need hardly tell you, Sir, and I am sure you will appreciate it, that our small province cannot put in all this money in this concern and I should be excused if I join my fellow brothers in praying that money should come forward from the centre. I will only add that the bigger provinces have higher resources and therefore their capacity for saving their money is also bigger and they can thus spare the money but the smaller provinces cannot, and I feel that I shall get all due support when I appeal to the Government of India to give donation more generously to the smaller provinces rather than to the bigger ones (Laughter) ; and I shall join my brother from Orissa in all

that he has said in this behalf. We have however been a small province and as he put it, our tail has been cut off and added on to them. So we are still smaller now and therefore my appeal has the greater force. The Forest Department in our province regulates grazing, and as the notes have been provided to all the members of this House they will have noticed that our province have been doing a great deal in this behalf, and if they peruse these notes and if they care to look into the working of the Forest Department in our province, I believe their labours will not be spent in vain. Then there is one thing that I wish to add to what I have already said. The output of bulls from the Government farms is only about fifty per year, and we have three million cows. So it will be easily appreciated that the strain on these poor bulls is enormous (Laughter). Out of these fifty that the Government farm produces, some again, are too young and some are too old (Laughter). We therefore need help in this behalf, and we shall thank you, Sir, to lend us some bulls from the other provinces. In our district associations we hope to establish small centres at which breeding will be controlled by persuasion. I do not think I need mention any details and tire out your patience as I know we are looking forward to a very interesting programme. I wish therefore to thank you for giving me this patient listening and I finish. (Applause.)

Chairman : We shall adjourn now for lunch. We shall now go up to lunch as His Excellency the Viceroy has invited all the members of the Conference to luncheon, and we shall re-assemble after lunch—it may be about 3 o'clock.

The Conference re-assembled after Lunch at 3-10 P.M., the Hon'ble Kunwar Sir Jagdish Prasad in the Chair.

Chairman : Mr. Khaparde, probably the Conference would like to hear your views about the fund because you said nothing in your speech as to whether you approve of the proposal to have a provincial fund and, secondly,—and this is a point which has not been mentioned by previous speakers—what should be the relation of an Association or a Committee which is going to be established to the Ministry. That is a very important point. I shall be glad if you will give us your views on the subject whether you approve of the idea of a fund and what in your opinion should be the relation of this Association or Committee to the Ministry. If you wish to speak on this subject, I shall be very glad.

The Hon'ble Mr. B. G. Khaparde : Sir, in our Sanskrit there is a very salutary proverb, which, when translated into English, means that before we begin anything auspicious, we must have a basketful of grass. That only means that nothing can be done without funds. And when I am called upon to express my opinion as to whether funds in provinces should or should not be started, I feel that there could not be two opinions about that. I think everybody will agree that funds are absolutely necessary for carrying on propaganda and realising the ends for which we have all combined now to work. At the same time, I feel

constrained to say that much should not be expected at this time from the provinces for the very simple reason that my province has been going through lean years for a long period—about six years—and we have lately contributed to several funds. Though we recognise the importance of building up a fund for this purpose, I hope it will also be recognised at the other end that we have our own limitations within which we can make progress. This is so far as the fund is concerned.

With regard to the relations that this Association should bear to the Ministries, I think the Ministries and the Provincial Governments believe in direct communication with this body, and the provinces ought to be kept well-informed as to what is going on in consequence of the resolutions that will be adopted in this Conference. The Provincial Committees, if such are formed, will take cognizance of all the resolutions passed by this Conference and reports might come up from all provinces as to what action has been taken in order to materialise those resolutions. I hope these resolutions will be sent to different provinces. I do not know if it is under contemplation as to how the funds that will be collected should be divided, but my own idea is that the provinces should be allowed to keep a very large proportion of the funds that will be collected by them. If there be any idea of getting the provinces to contribute to the funds that will be supplied from the Centre, the scheme may not work smoothly.

Chairman : I do not think there is any proposal to ask for any contributions from the provinces to the Centre.

The Hon'ble Mr. B. G. Khaparde : I am very grateful to hear that from you, Sir. On the other hand, I was just going to say that we are expecting some help from the Centre itself. If the Central Government finds that strenuous efforts have been made by the Provinces in order to collect funds, I think those provinces deserve help and we hope that the Central Government will help the provinces with funds. As I told you, in spite of our keen desire to follow the programme and in spite of our keen desire to materialise the resolutions adopted in this Conference, we may find it very difficult for want of money to carry the resolutions into effect. As I have been just telling this House, our programme to start breeding farms is going to cost us about Rs. 47,000 next year and Rs. 30,000 to start with and there will be a recurring expense of Rs. 16,000. Now, to undertake a project of that kind it is practically beyond the powers of our province as we stand today. I have no more suggestions to make.

The Hon'ble K. B. Saadullah Khan : Sir, the N. W. F. P. is a very small province with limited resources of income, but still we have been able to subscribe to the appeal of His Excellency the Viceroy about Rs. 17,000 or Rs. 18,000 from the whole province. This shows that a population of 3 millions of people have been able to subscribe to that extent. If the same ratio had been observed by the rest of India, then I believe several lakhs would have been collected towards that fund. There is a small district agency, outside the British Empire, that is in the tribal territory and in that agency the population is only 50,000 and there they have been able to collect about Rs. 5,000 and if that proportion were observed, then a sum of more than 2½ crores would have been subscribed to the fund.

This is all due to the exertion of the district officers and through the co-operation of the people. We appreciated this scheme very much and of course the provincial people have subscribed about Rs. 13,000 from the settled districts and in addition to that we have subscribed Rs. 15,000 from the provincial funds and Rs. 12,000 from the district boards. This shows how the N. W. F. P. people take keen interest towards this scheme.

Now Col. Noel our Director of Agriculture will suggest ways and means of raising fresh funds for this scheme and in addition Mr. Shah who is the Superintendent of the Veterinary Department will produce some subsidiary scheme which is being worked in the province and how it has been appreciated and approved by His Excellency the Viceroy.

The Hon'ble Nawab Bahadur of Dacca : Sir, I have heard with great interest to what other Honourable Members have said. If I heard them aright, this conference was called for the purpose of gathering information from the different provinces in regard to what they have done and what they propose to do. The better course would have been if letters had been written to the departments of the various provincial Governments, then we would have been able to get a definite outline of what these provinces proposed to do. The purpose of this conference is to discuss this question amongst the Ministers themselves. Then I would have suggested that a small committee should have been appointed who would have toured the country and would have discussed the problem with different departments of the different provinces. After that this conference could have been called. It is so difficult for us to give any opinion in regard to other provinces because in a small conversation in this House, we cannot understand the problems in each province. As we have heard from all Honourable Members, the main problem is one of finance. Very good and useful schemes could be put before the conference if only we had the necessary funds. Talking about my own province of Bengal—I do not want to discuss here the Meston Award or the Otto Niemeyer report—my province has been very badly treated and we are already suffering from economic depression and it is impossible for us to suggest any big schemes on behalf of the province because there are many other more important schemes which are awaiting sanction of the Government in the province.

Some Honourable Members gave a list of what they have been able to do in their own provinces. In Bengal we have also started an Animal husbandry department. We have got district funds which we propose to close down and start provincial fund. I agree that there should be provincial fund for the cattle improvement. But I do not agree that this fund should be under the control of a committee. In Bengal at least this is an absolutely new thing and for the present we have decided that the fund should be run by the Ministry with its departmental heads. I agree that there should be a provincial committee, but its function should be of an advisory character. A non-official advisory committee will be welcome, but I do not think that for the present the funds should be controlled by this advisory committee. I also agree with what the Hon'ble Minister from Bombay said. In our province there are certain people who are presenting bulls which are absolutely of no use. Certain people are putting special restrictions that the bulls should be kept in certain selected areas. We now propose to ask these gentlemen who

present us with bulls that instead of bulls they should give us cash subscription so that it may be better utilised by the department itself.

Most of the work we have done is through the Government of India grants and if the Government of India agree to continue this grant, we will be able to do better work. I would like to say another thing. The Governments all over the world always subsidise any new venture. Here the Government of India have subsidised iron and steel. The best thing for the Government is to subsidise the thing which depends upon agriculture. If the Government of India really wish to do any good to the country, for at least five or ten years and if the Government of India want to see this department stand on its own legs, then they should give a grant. The provinces have already great demands on their exchequer and they cannot find any large sum of money for any big scheme. India depends upon agriculture. Iron and steel cannot be eaten. If India should become a nation then it is essential for the Government to develop the agricultural department and for that the animal husbandry is most important. I would humbly suggest that the Government of India do continue the grant as a subsidy for the next five years or 10 years.

Chairman : I should like to know if any of the representatives of the Indian States would like to say anything.

K. B. Chaudhri Mohammad Din : Sir, an Animal husbandry department has recently been established in Jodhpur State. The scheme was approved by Sir Olver and it has been approved by the Jodhpur Durbar. Two lakhs has been allotted for the purpose. His Highness is very keen in the matter and steps are being taken to improve the cattle breed in villages and encourage the maintenance of better stock. Marwar is famous for its Nagur breed which is known all over India. Bulls are being distributed free every year and a cattle improvement fund is going to be set up for the maintenance of such bulls out of the village malba fund. We are very thankful to you, Sir, and to Sir Olver for the very valuable help and guidance given to us. I hope we will make it a success in the State. We have got a grass farm section in the animal husbandry department and the area under grass farm is 15,000 acres at present and it is hoped to increase it by another 6,754 acres making thus a total of about 21 thousand acres odd. A scheme is under consideration to increase the output of grass farms.

Chairman : I forgot to call upon the Hon'ble Minister from Sind to speak. I apologise to him.

The Hon'ble Mir Bandeh Ali Khan : I thank you, Sir, for giving me an opportunity to speak on behalf of Sind. Hitherto Sind was kept with the Bombay presidency and as such very little efforts were taken in the direction of improving cattle breed. Sind is predominantly an agricultural province. We have got one of the biggest projects, the Lloyd barrage project. The future cultivation of crops in Sind depend entirely on a good breed of bulls. For this purpose we must try to improve the cattle breed. Sind is not a rich province. It will not be possible for us to carry on this scheme unless we are given some subsidy from the Government of India, because indirectly Government of India also benefit if our agriculture improves. Although Sind is a poor province, yet we have district committees which were able to collect about Rs. 14,000. We want now to start

a provincial cattle improvement fund under the presidency of H. E. the Governor of Sind with officials and non-officials as advisers and if we are able to collect substantial subscription, we would like to utilise that fund and the interest accruing therefrom on the improvement of cattle. We have got in Sind three good breeds of cows, one called the Thari, the other, the Karachi and the third is the Bagnari. We are having these three in different tracts, and we shall improve these breeds. We should also like to engage one livestock officer because it is essential to have one expert to supervise and advise the people and also the agency under which this department will be working.

Sardar Jarmani Das : There has been a very satisfactory response to the appeal of H. E. the Viceroy for setting up a cattle improvement fund in the Patiala State. His Highness has set aside over half a lakh for this purpose with which bulls will be bought and distributed in the villages, and the peasants and cultivators have agreed to buy these bulls at half price. So the Government as well as the people have responded to H. E.'s appeal. Then, His Highness has from his own privy purse started bull breeding in the State. Recently Fresein bulls and cows have been imported into the State for breeding purposes and it is hoped that in a short time the cattle breeding on scientific lines will be in full swing. It is also contemplated by His Highness' Government to open Dairies on commercial lines in most of the important towns of the State and this will give further impetus to good breeding of cattle. Not only have we thought of the plains, but His Highness has got over a hundred cows and ten bulls of Koh-i-Damni breed from Afghanistan which we have distributed in our hill territory, and they are doing very well. They are of the same size as the cows and bulls of Simla district but with twice the yield. They yield 4 to 6 seers while the Simla hill cows yield only about 2 seers. Board of Agriculture composed of expert officials and non-officials with Secretary, Forests (Minister in charge of Agriculture) as Chairman and Director of Agriculture as Vice-Chairman has been formed recently before which board, schemes for cattle breeding are laid for discussion and advice. His Highness is doing everything possible to improve cattle breeding in the State, and we employ efficient and capable men trained in foreign universities to take up this work. I think we are far ahead of many other States in this respect.

Mr. K. R. Narayana Iyer : Sir, as soon as His Excellency's appeal was issued it was translated into the local vernacular and bulletins were distributed in large numbers but in spite of our best efforts the response for donations and subscriptions was not satisfactory. But at the same time the Government of Travancore recognising the great importance of cattle improvement in the State sanctioned a small Scheme for grading up the cattle in the town of Trivandrum, the capital of the State as a first step in this direction. Five good Sindhi bulls have been got down and stationed at five different centres within the municipal limits of the town. As a result of the experience gained by us so far, it has been found that of all the breeds of cattle tried in the State, the Sindhi thrive fairly satisfactorily withstanding climatic conditions to a certain extent. The cows of this breed have also been found to be regular breeders and heavy milkers.

In accordance with this Scheme, each bull will be under the charge of a bull keeper appointed by the Agricultural Department. The bulls will

be mated only with selected cows which are in prime condition, of well built body and which are free from the attack of chronic or infectious diseases. All the cows which are found fit to be mated with the bulls, will be registered under the Scheme and certificates of registration will be issued to the owners of all cows that come up to the standard. The milk yield and other characteristics of these cows will be recorded in a special register to be maintained for the purpose. A history of the calves that are born to the registered cows will also be maintained and the cow calves when they attain maturity will also be brought under the Scheme. To avoid contamination every effort will be made to remove the scrub bulls from the scene of operation.

To encourage cattle improvement in the rural areas the Government award every year a certain number of grants for the maintenance of stud bulls by private owners and there is a proposal to raise this number from 15 to 30. Four Cattle breeding co-operative societies have also been organised in different parts of the State and one of them is managed and run exclusively by women. These societies do very good work and the milk and dairy produce from each of these societies are sold in co-operative sales depots specially opened for the purpose in the nearby towns. Periodical Cattle shows are also held in various parts of the State and prizes are awarded for the best specimens of cows and bulls exhibited.

His Highness the Maharajah and Her Highness the Maharani take a deep and abiding interest in the matter of improving the cattle of the State. The Palace Dairy Farm maintains an excellent herd of Sindhi cows and the daily average of milk yield for the cows in lactation is from 28 to 30 lbs. The stud bulls in the Farm serve the cows of the public for a nominal fee. Calves of Sindhi cows are also sold from here at cheap prices. This Farm is doing pioneer work in the popularisation of Sindhi cattle in the country. The possibilities of growing Napier grass, Guinea grass, etc., and using them as cut fodder for cattle are also being demonstrated on a large scale by this Farm.

Thus everything possible is being done for the improvement of the cattle in the State but the problem that we have to face on account of the heavy rainfall, warm humidity and the comparatively coarse fodder that we have, is entirely different from what it is elsewhere in India. I would, therefore, request the Imperial Council of Agricultural Research to view the problem here and in Malabar in a different light, altogether and do what is necessary for the improvement of our cattle. We have no special breed of cattle at all in the State at present and the cows and bullocks which are puny in size belong to an entirely non-descript type.

Mr. V. L. Wazir: The Kashmir Government have taken special interest in the problem of cattle improvement and have been getting expert opinion from outside also. At first these efforts were on a small scale, but for the last two years we have taken up this question in right earnest. Under this scheme, ten centres located in different provinces are being selected with a view to have comparatively good grazing and the cattle are of a better type. In these centres it is intended to register the good stock and castrate the unsuitable ones. The bull suited to the locality will be given to an agent selected from among the zamindars who

will be given about Rs. 8 to 10 per month for the maintenance of the bull. We have already purchased bulls and the cows are registered in the centres. These centres will be like small demonstration farms, so that people near about can take lessons and take up this problem on their own. In order to remove any trouble which the people may give us about the castration of unsuitable bulls, we have framed a Bill on the lines of the action taken by the Bombay Government, which will come up in our Assembly in the next session and by which we will be empowered to effect compulsory castration in these selected centres to begin with. Then in the surrounding villages we are going to castrate the bulls and have only a selected number of bulls that will be given any license. These licensed bulls alone will be allowed to breed. This in a nut-shell is our scheme. We have purchased bulls already and Rs. 17,000 has been allowed by Government. It is of course a small amount but our Government is in right earnest about it. We have of course to face difficulties in the shape of religious sentiments, etc., but the Government realise that the time has come to take steps so that the agriculturists may benefit.

As to the question of raising funds we have not taken up the subject as yet because we thought the Government should first do something substantial to show to the people what their interests are and we have given effect to this scheme. We will soon appeal for public funds and people can then come forward and help us. We have recently formed a Board of Agriculture composed of expert officials and also non-officials, *e.g.*, the Director of Agriculture and the Registrar of Co-operative Societies and the Governors of two provinces, with the Honourable Revenue Minister as Chairman. When I go back from here I will suggest a discussion of this question by this Board.

Mr. R. C. Woodford : In Assam we realised in very early days that no permanent good could come from the Viceroy's appeal unless it took a permanent form ; and as a result of that I think the suggestion for the formation of provincial livestock improvement associations first came from Assam and we were actually the first to form such an association. I regret that we have not sent in this information to the centre ; the paragraph on Assam in the printed note is at least nine months out of date. The present constitutional position of our livestock Improvement Association is that the Governor of the province is the President, the Minister of the department dealing with livestock is the Vice-President and a member of the Governing Body ; the Secretary of the department is a member of the Executive Committee. So that Government is well represented. On the Executive Committee are the Director of Agriculture, the Superintendent of the Civil Veterinary Department and myself ex-officio as the livestock officer ; also there are three or four non-officials elected from the Association to the Executive Committee at the centre. The present position of the Association is as follows : A fund of Rs. 25,000 has been established ; it has nothing to do with departmental grants for livestock, but entirely owing to the Viceroy's appeal. Sub-divisional branches have been formed in all Sub-divisions with their own executive committees of which the Deputy Commissioner of the district is the ex-officio President and the Sub-divisional Officer the ex-officio Vice-President. The Chairman of the Local Board is also ex-officio Vice-President, provided the local board gives a certain annual subscription. All veterinary assistant surgeons and livestock inspectors throughout the province

are ex-officio branch secretaries. That means that they are the men who will really do the selection and registration of breeding bulls under this Association scheme. The membership up till now is 600 permanent subscribing members. The Association has been registered as a society under the Act of 1860 giving it a permanent form. A memorandum of Association has been printed and filed ; rules have been printed and issued to branches, and a general plan of action has been prepared to co-ordinate the action of all branches. The first plan aims at the selection and registration, and, where necessary, the subsidising of 2,000 bulls, and there is not the slightest doubt that under the present organization we can do a great deal. The response in actual bulls in response to the Viceroy's appeal was over 300. All these have been handed over to the branches or the subdivisions from which they were presented, and the money collected at the centre under the Viceroy's appeal has been redistributed to the subdivisions from which it came. Of course every one likes to spend the subscriptions collected in his own area. That is how we stand in regard to the Viceroy's appeal question at the present moment.

Mr. F. Ware : Sir, I have to apologise for an error that seems to have crept in our note that was prepared for our agenda, but we did not have time to find out what the latest position was, and these remarks are based on the information provided by departmental officers at the last meetings, partly in Madras in December last and partly in Delhi in January last, and I do hope you will accept my apologies.

Referring to the discussion on this subject, Sir, we have heard a lot of interesting information from the different provinces as to what is being done with regard to cattle breeding. Only, as was to be expected, possibly the question of finance has taken a major part. I think it has been raised by every province except Assam, and when I say finance, I mean financial help from the Government of India. I am not in a position to say if the Government of India would be prepared to make any contribution in this scheme of work, but I think I may say that if the Government of India are ever in a position to be able to do so, they will require to know that this money is going to be properly spent and administered, and for that reason I would like to draw your attention to these three points which were put forward at the beginning of this discussion by Sir Bryce Burt in regard to this item on the agenda, for if we could come to some agreement on these three points, we would have gone a long way towards providing for the distribution of funds when they become available. I would remind the House what these three points are—(1) the establishment of cattle improvement funds, (2) the nature of the provincial organization for the administration of that fund, and (3) its relationship to the several Ministries of Agriculture and to the expert officers concerned with live-stock improvement.

Before I sit down, Sir, I should like also to draw attention to an item of detail, which is an important detail, which is included in our Note on this subject. In the Note by the I. C. A. R. which is before you it is laid down—" The Livestock Improvement Sub-Committee of the Animal Husbandry Wing, which met at Madras in December 1936, went a step further and recommended that in future no gift of a bull should be accepted unless it is accompanied by suitable provision for maintenance ". Actually, Sir, I was not in this Livestock Improvement Committee, and

so I did not hear the discussions which took place at that time, but I understand that some real difficulties have been experienced in at least some of the provinces in connection with H. E.'s scheme. Most Livestock departments or sections in the provinces have made out schemes for the province and the different parts of the province, and naturally they only want those bulls which suit their schemes well locally in those districts. I understand what is happening in some provinces is, that some kind gentleman comes forward with a bull and wants it to be placed in a certain village where it does not fit into the general scheme. In order to get over the difficulty, I think all technical officers will agree with me that any gift of a bull should be made only with the approval of the Livestock department, and I hope that we shall be able to get that on record. If you agree with that proposal, then it will enable me to raise another point that has exercised my mind for a good many years in India, and I expect it has exercised the mind of many others too, and that is, is it possible to make any use of the long established custom of presenting Brahmini bulls ? The Hindu community generally wishes to present their Brahmini bulls, but these bulls should first be approved by the Livestock department of the province. That will help us to make great use of this old custom, and I am rather hoping that possibly some in the House will support me in that.

It was stated, I think, by the Hon'ble Member from Bengal that in his own province instead of private gentlemen donating bulls, they are trying to persuade them to donate cash. That of course is, I think, the obvious line. If this work of cattle improvement is going to be supervised by the Livestock Department, it will be far better for the Livestock Department to have more cash and buy what bulls they want. But the other point we have got to consider is the question of their maintenance, and I think that in this room opinions are divided as to what form the maintenance should take. In fact, I believe in some provinces there is a distinct feeling that no maintenance grant should be given for breeding bulls, that it is far better to try and encourage the independent spirit of the ryot, and to tell him that if he or his friends want a bull, they must arrange to maintain it. On the other hand, as you have heard, in some provinces maintenance grants are made. It will not be possible therefore for us to get uniformity in this matter, but I do think it is very important that we should have uniformity in each province, *i.e.*, it would not do if a ryot in one village is given a maintenance grant and in an adjoining village he is told he cannot have one because his bull comes from some other source, but I think that if my first proposal is accepted, *i.e.*, all gift bulls should be approved by the Livestock Department, this difficulty will be removed, because they will be maintained from the same grant as the Government bulls are maintained.

Chairman : Would any official or non-official like to speak ?

Mr. B. K. Badami (Hyderabad) : Sir, I am not asking for any grant from the central Government, because we have enough money to carry this programme of work. But I wish to make one or two general observations from the experience we have had during the 25 years : I can say that while enthusiasm for increasing cattle breeding farm is good in its own way for research work and for the supply of a few bulls, the private breeders should not be overlooked in any scheme of cattle breeding. We know that in some parts of the country there are many private breeders who

have got great experience in this line. Government farms alone cannot provide all the bulls that are needed. Some of the best cattle, one sees, are bred by private breeders in the country, and quite a large number of these are hereditary breeders. If some of them are not taking sufficient interest now, they may have some difficulties in regard to grazing for cattle or assessment on land or other difficulties. This is a matter which requires the serious attention of competent authorities. Except in a few places the cattle breeding farms are in out of the way places or far away from the natural home of the breeds, and what is turned out may be called ' hothouse ' bulls. H. E. the Viceroy said this morning that the wellbeing of the ryot depends on the livestock of the country. This reminds me of a recent instance in Hyderabad that in one of our districts the Collector asked for bulls. But I had not to depend on private resources and my Government sanctioned enough money. Ten bulls were distributed experimentally. The Revenue Department also suggested offering a large sum to buy agricultural cattle for the ryots and for cattle breeding and to provide breeding bulls in the villages. This led me to inquire how far we could do this. An intensive inquiry was set on foot in 21 villages watered by canal irrigation. Cattle were examined in detail, and we found that 60 to 70 per cent. of the cattle in those villages suffered from liver flukes. Out of the 10 bulls I had distributed a year ago, it was found that 4 or 5 of them were already suffering from liver flukes. I feel that in trying to make any improvement in regard to cattle, it is most necessary to make a provision for adequate veterinary aid, without which there will be no good done. I feel there should be provincial and State advisory boards to deal with livestock improvement consisting of the representatives of the Revenue, Forest, Co-operative, Industrial, Agricultural and Veterinary Departments who should take active part in concerting measures to ensure success. Non-official gentlemen who evince live interest in livestock should be associated with the advisory Boards. Sir, without their co-operation, we will be no where, and when this is done, it would be possible to show definite progress. We are having all the funds that we want in Hyderabad from Government and we have not tapped private resources yet. I know there are very enthusiastic zemindars in Hyderabad who would offer bulls, but the trouble one experiences is the same as Mr. Ware has described. Private associations are needed and I also feel whatever committees or associations we may have, the help and advice of non-officials who are really interested in cattle improvement and are themselves either cattle breeders or big zemindars, would be most desirable. All executive work must be in the hands of one department, the livestock department, or the veterinary department, or any other department—I may be partial to my own department, but I think it is the most suitable department which can take on the work, and I have no doubt that with the advice and help of other departments we ought to make it a success provided that, in His Excellency the Viceroy's words, " There is a continuity of policy and control and method substantiated with necessary funds ".

Lt.-Col. Noel : The speakers up till now have stressed the financial side of the problem. They have stated unanimously that there is no possibility of raising enough money from provincial sources. I propose to throw out one or two suggestions as to how money could be found. You are well acquainted with the principle of the cess. We have a cess on lac,

on cotton and other commodities and it is admitted that they work well. The proceeds of the cess are devoted to the development of the industry concerned. Up till now the levy of a cess has been the prerogative of the Central Government, but under the new constitution it will be a provincial subject. Every province can levy a cess on any commodity it likes. In the case of N.-W. F. Province, if we put eight annas on every bullock which comes into the province we can raise Rs. 40,000 which is twice as much as we are spending on cattle subsidies scheme. That is one suggestion.

Another is as follows. In some districts a tax is levied on animals which are brought to cattle fairs and are sold. There is a great diversity between the rates of taxes levied. I have been looking into the figures and find that it varies up to 3 per cent. of the sale value. I suggest that the Provinces should rationalise the levy of the taxes and get the District Boards to agree to accept a share somewhere in the neighbourhood of what they are getting at present and allow the rest to be devoted to cattle breeding. In this way a handsome amount could be raised. In the North-West Frontier Province all subscriptions have been in cash and bulls have not been donated. The problem of utilizing subscriptions is therefore simplified. Moreover our task in the N.-W. F. Province is rendered still easier by the fact that a source of breeding bulls has been made available. This is due to our subsidy scheme which has been running successfully for seven years and now numbers 240 stud bulls—no mean number for a small Province like the N.-W. F. P. From the progeny of these bulls we are already having new recruits as stud bulls.

Babu C. L. Kanoria : I have much pleasure in supporting my friend, Mr. Ware. I am grateful to him in bringing the matter of Brahmini bulls before the Conference. It will help in the improvement of bulls. I have got nothing else to say. Arrangement should be made for those bulls which are wandering in the streets and for which nobody seems to care.

K. B. Nawab Chaudhri Muhammad Din (Jodhpur) : As regards Mr. Ware's proposal about Brahmini bulls I want to say that we have in Jodhpur already taken steps to guard against undesirable bulls. They are being segregated in a reserved area which His Highness has graciously placed at our disposal. As for the future, His Highness has passed orders that all bulls intended for dedication should be duly inspected by the Department and approved by it.

Sir Madhorao G. Deshpande : On behalf of the non-official members I must first of all thank the Central Government for allowing us to take part in this discussion. I have heard with great pleasure the speeches made by the Hon'ble Members of provinces and other gentlemen. I find that the difficulty of the Hon'ble Members is finance. But from the Indian States I have not heard this complaint. I do not know the reason why there should be this difference, why our Governments should be short of funds. No one from the States has stated anything about the finances. Government generally complain that agriculturists are very extravagant and do not know how to spend money. But here I find from the spokesmen of the provinces that they have got no funds. As regards the condition of agriculturists you are aware that during the last 5 or 6 years they have been badly off. They are not in a position even to pay the land revenue to the Government. So, if you expect at this stage any financial help from

them, it will be useless. Secondly there is the question of control. At present in the C. P. we have distributed the bulls and their management is given to some of the leading members of the village. I do not know how far this will be a successful scheme because everybody's property is nobody's property. If you do not give the bull to a particular individual, then I doubt whether that bull will be kept in a good condition. I, therefore, suggest that the management should be given to the veterinary department and the bull should be inspected now and then. We have got a premium scheme, but it has not been given effect to. I think it should be encouraged if the Government wish to come to the help of the cultivators.

Mr. P. J. Kerr : Many of the speakers have referred to the distribution of the bulls, but very little stress has been laid on the necessity, and it is very urgent, for supervision as to the care afterwards not only of the bull but also its work and services. First of all, there is the selection of the person who gets the bull, and after that, you have to see that he carries out the obligations which he undertook when he took the bull. This applies also to Mr. Kanoria's suggestion about the utilisation of Brahmini bulls. Very excellent Brahmini bulls were donated, but they were let loose, and, as was said, everybody's property is nobody's property, and the best bull may degenerate. Only suitable Brahmini bulls should be donated and they require selection, and they should be given to the livestock officer or the livestock organisation of the province or State. They should be placed where they are required and after that, they should be supervised for their health and welfare. Money for maintenance is another point, and there I differ from a good many other people. I do not think if this scheme is to be a success you can make a difference between those originally purchased and distributed for which maintenance is granted and the progeny which will afterwards be brought in for further distribution. As an alternative to this, in order to make it possible for the real genuine cultivator of a small holding to take bulls, bulls may be presented in pairs and that I think is worth consideration. The bulls can do their full day's work if they are properly fed and their full year's service as well ; it is only a matter of feeding them properly. There is one other point about which I have thought very seriously for a long time and that is finance for the provincial animal husbandry schemes. I have already submitted a note that a cess should be levied, not at fairs, but on every adult cattle beast in the province ; it might bring a million rupees at one anna cess per head in Bengal but that has not been accepted because it is direct taxation on the ryot. I do not think this is sound argument, because all money that we get in the provinces as revenue practically comes from the ryot and his labours.

Mr. W. J. Jenkins : I should first like to deal briefly with one or two points which had not arisen when the Hon'ble Minister for Agriculture for Bombay made his speech, namely, with regard to the three points which were enunciated by Sir Bryce Burt at the opening of the meeting. As regards the establishment of cattle improvement funds, we have already found out from the discussion that has taken place, that in many provinces, such funds, or the nuclei of such funds already exist, and the intention is not to allow these funds to lapse, nor to allow the interest which has been aroused in cattle improvement to dwindle, but to have some permanent body to control and administer these funds in future. I think I may say that we in Bombay were very much struck by the organisation which has

been established in Assam and which was so briefly and succinctly described by their Live Stock Officer. We feel very definitely that two points must be observed. Firstly, that any Cattle Improvement Association upon a provincial basis must be founded on district branches and in that way and in that way alone can we hope to maintain local interest in the work and deal with local problems in the way that people in the districts require. We also feel that a very close association should be maintained between any such Association and the Minister in charge of Agriculture or in charge of livestock improvement. I think I have my Honourable Minister's agreement in saying that he thoroughly agrees with the suggestion that His Excellency the Governor should be the President and the Minister in charge should be Vice-President or, if His Excellency is not the President, then that position should be taken by the Minister of Agriculture. I also agree with one speaker who mentioned the necessity of enlisting the co-operation of the Forest and Co-operative Departments in this work. I feel personally that the greatest development of cattle improvement is going to take place through co-operative organisations. That deals very briefly with the question of the establishment of funds, the nature of the organisation and the relationship of such organisation to the Ministry of Agriculture.

With regard to maintenance of stud bulls that is the matter in which we have found the greatest trouble. To begin with we cannot rely on giving bulls to people who would maintain them free and I submit that, in many ways, it is undesirable that people should be asked to maintain these bulls free. For one thing, the Agricultural Department, or the department which is controlling the registration of the progeny, has a very much better hold over the agents if a certain amount of subsidy is given. I notice that in the I. C. A. R. note, a suggestion is thrown out that this registration should be done by the agents themselves. I say that is definitely impossible. This will have to be done by some official agency and, although I have not the Honourable Minister's agreement in this suggestion, I think the work connected with the registration of progeny should be a legitimate charge on any cattle improvement fund in the province. The question of utilising Brahmini bulls in any scheme of livestock improvement is not going to be such a simple thing as has been suggested and I think that probably some form of legislation will be necessary before this could be definitely done.

The Hon'ble D. B. Sir S. T. Kambli : With regard to the work of registration, I think it must be undertaken by some official agency.

Khan Sahib S. M. A. Shah : In the North-West Frontier Province there are many areas where there is not enough fodder. So we have surveyed all our districts and earmarked the areas for the purpose of cattle improvement. The zamindar who is really keen on the improvement of cattle deposits Rs. 50 for the purchase of the Bull. The rest is paid by grant from the district board. Subsidy allowance is fixed at the rate of Rs. 8 p. m. from the date of location and no cash payment is made by the District Board until the advance is paid off. Then the zamindar becomes the owner of the bull and is entitled to a cash subsidy allowance of Rs. 8 p. m. from the District Board in return for the service of the bull. He maintains two books. In one he records the coverings and in the other he records all the produce. And the counterfoil is given to the bacha, so that if the bacha is sold, the seller gets a better price and so we have an

accredited progeny. For maintaining livestock accounts, we have got stockmen whom we give six months training at the Central Veterinary Hospital, Peshawar, and we give them Rs. 25—1—35|2—50. They go about touring in villages and they prepare monthly returns which are sent to the Veterinary Department and the District Board. A register is maintained in every Veterinary Hospital showing the number of bulls attached to the hospital as well as the total coverings of each bull. We have a pukka check on the amount of subsidy that we are spending. At the end of the month we send an acquittance roll to the district board for payment. In case the service of the bull is unsatisfactory or his condition is not well maintained by the zamindar, we always have deductions. For instance, instead of 8 rupees, we recommend 6 or 4 and so on. We have a proper check on the whole scheme. Then we have another form in which the results of the last five years are recorded by the inspecting officials. They contain the name and designation of the Inspecting officer, date of inspection, name of Darinda, location of bull, date of entertainment, monthly subsidy, present age of bull, physique, number of coverings, fertile, infertile, abortion, bull calves, cow calves, sold before calving, died, unaccounted for, names of villages in which coverings and produce checked, number of entries checked and result, number of castrations performed last year and age at which performed, number of local bulls in the village where subsidy bull is stationed, how many cows are there and general remarks. We have therefore a pukka check on the work of our bulls. This scheme was submitted to His Excellency the Governor of the North-West Frontier Province who forwarded it to His Excellency the Viceroy and here is an extract from His Excellency the Viceroy's letter :

> The plan of subsidizing stud bulls which has been evolved in the North-West Frontier Province seems to me to constitute a very valuable contribution towards the technique of cattle improvement. I know of no reason why it should not prove as successful in other parts of India as evidently it has with you and I propose carefully to consider the expediency of recommending it for trial in other provinces. I am much attracted by a plan that (*a*) avoids something for nothing and (*b*) makes the approved stud animal appear to the public as a cultivator's animal and not a part of Government, and (*c*) combines the advantages of (*a*) and (*b*) with a sufficient measure of continuous control by the Veterinary Department.

Sir Bryce Burt : If I may sum up the discussion that has gone so far, it seems to me that there is on the whole agreement on three main points. In the first place I think there is a very general agreement that there is to be established in each province and State a provincial cattle improvement fund and funds will be raised for the improvement of cattle by un-official effort. I should like to repeat what I said at the beginning that we are dealing mainly with money which is raised by un-official effort and by close association between Government and non-officials. Government alone can do far less with cattle than it can with crops. That is the experience in practically every country and after 30 years experience in India I have often felt that if there is one thing for which you can raise money it is for cattle improvement and I do feel that the provincial cattle improvement funds will be able to get a steady, if not large, stream of money to supplement what Government itself provides.

As regards the administration of this fund, there also there seems to be very general agreement that though in some provinces an association would be a more suitable form and in others a Board, there should be a close liaison with the ministry, that the Minister himself should be either the President or the Vice-President and also that the livestock officers and veterinary officials should be closely connected with the executive of the Board or association as the case may be.

There is also a strong body of opinion that any such association or board must be based on district branches, so that you might have the enthusiasm in the districts and the money collected in the district is sent back to it for its being utilised there. We are not suggesting any contribution to the centre whatsoever. One or two speakers felt obliged to protest that such a suggestion should be made. No such suggestion has been made and I think the suggestion which was made by several speakers that the district should receive back the greater part of the contribution to the provincial fund is a very sound one. On those points there does seem to be practical unanimity.

There remain two points—maintenance and registration. I do feel that the registration of pedigree stock and progeny is a most important step. His Excellency the Viceroy referred to it this morning as being very essential and I feel that provincial associations or boards should give attention to that point. We cannot hope to lay down a procedure for the whole of India. That must be left to the provinces and states. If I have correctly stated the conclusions of this conference, as I hope I have, then we will put forward a formal resolution embodying these conclusions tomorrow for your consideration and acceptance.

The Hon'ble Nawab Khwaja Habibullah Bahadur : There has been practical unanimity that the Government of India should contribute and help the provinces. I hope you will put that also in the Resolution.

The Hon'ble Chaudari Sir Chottu Ram : With regard to the creation of provincial committees, I think that no administrative functions should be assigned to them. I must make my own position clear in this matter. I am absolutely clear in my own mind that no administrative functions should be entrusted to these committees. They will consist of officials and non-officials who will come into conflict with the party in power and friction will result. So I am definitely of opinion that in the Punjab no administrative functions should be assigned to these committees.

The Hon'ble Nawab Khwaja Habibullah Bahadur : I agree with what the Minister from the Punjab has said.

The Hon'ble Mr. Gora Chand Patnaik (Orissa) : That may be the experience in the Punjab but in other provinces it is altogether different. In matters like this officials and non-officials should co-operate. I do not think there will be any difference of opinion. The officials should be taken in some proportion. Then it will be allright.

At this stage the Conference adjourned till 10 A.M. on Wednesday, the 26th May 1937.

The Cattle Conference met at 10 of the clock in the Council Chamber of the Viceregal Lodge, Simla. The Honourable Kunwar Sir Jagdish Prasad, presiding.

Chairman : We shall now take up item (2) of the agenda.

Mr. E. A. Smythies : The excellent note which the I. C. A. R. has prepared on this item of the agenda distinguishes between three types of lands, lands under the forest department, other waste lands and cultivated land. I propose to follow this very convenient classification and to make my remarks on each of these three items separately. The note at the commencement emphasizes that where the general plan for improvement of fodder and grazing was recognised the subject bristles with administrative difficulties. I assume therefore that this conference will be considering these administrative difficulties or some of them and try to find ways and means of overcoming them. Finally the agenda mentions appropriate agencies. Therefore I think for each of these three types of lands, we shall have to consider two points, firstly, what are the difficulties and secondly, what are the best agencies of overcoming them. I might mention that the first two types alone cover 65 per cent. of the total area of British India. This gives us some indication of the immensity and importance of the problems that we shall be discussing to-day.

Dealing first with the areas under the Forest Department, the preliminary report of a meeting at Madras distinguish between two types, the moist type and the dry type. The moist type is typified by the Terai, the Ganges valley and similar areas of perennial grass. This type does not give us any very serious problem to tackle. We can say of it that the more the cattle the merrier and the more the better fare because it is only by heavy grazing that the grasses are prevented from becoming coarse. In fact towards the end of the rains and in the earlier cold weather, grass is becoming too coarse for fodder anyway and the amount of grazing at that time almost becomes negligible so that the cattle have either to migrate or to live on straw fodder or to be fed on leaf fodder. There is no serious administrative difficulty in that type of area. The dry type is far more important as being the predominant type in all the provinces of India. In this dry type, we can say definitely that improvement of grazing and grass follows almost automatically by control of the grazing, by control both in time and incidence and that no improvement is possible without adequate control. Hence the problem boils down to an administrative problem, *i.e.*, how to institute and obtain adequate control. The report of the Madras meeting dealt with five provinces in detail and I do not propose to cover that ground again. It is obvious however that some provinces are fortunate in being able to have some control over village grazing in forest areas. They can limit the numbers, they can limit the time, they can introduce rotational closure and rotational grazing. The improvements which follow are well-known. A classic example is given by the Bombay Presidency and I am sure Dr. Burns will have some valuable information to give us. But other provinces are not so fortunate. In the Punjab in particular and in the Kumaon hills of U. P., the forest departments are helpless to introduce any improvements in grazing because the forests are burdened with uncontrolled and unlimited free right of grazing. It was suggested at the Madras conference that as control is essential, where necessary it should be given by legislation. This is a very big subject and a very big problem and it must be remembered that these long standing rights were themselves created or given by legislation, that is to say by the procedure laid

down in the Indian Forest Act in various settlements and where as in part of the Punjab, it can be shown that grazing rights are not only destroying the forests but also resulting in tremendous erosion of the land itself, there is I think possibly a case for legislation to overrule the forest settlements in the interests of a wider section of the public ; but where it is only a question of improving the grazing, I do not think now-a-days it is practical politics to suggest legislation to overrule the various forest settlements. I think the only alternative open to us is to do what we can by persuasion and propaganda and voluntary co-operation of the surrounding villages and graziers. It is however clear that the problem takes a different aspect in different provinces and therefore we cannot come to a single all-India solution at this meeting. This subject will have to be examined provincially. The note of the I. C. A. R. makes the following remark :

" It seems to be the intention of the committee ——".

This is referring to the Madras meeting,

" that the initiation of further measures of improvement should be left to the Forest departments, but it would appear desirable that the standing fodder and grazing committee which is recommended for each province under Part II of the report, should be in a position to make recommendations and give advice in regard to the treatment of the areas."

Well, Sir, I entirely agree with that and I suggest that it might come in as Resolution on this item.

Before leaving the subject of areas under the Forest department, there is one more point I would like to make. Page 9 of the note says :

" That proper management must involve expenditure which will not be immediately remunerative, and from which even the ultimate returns will very probably be mostly indirect. The mode of provision of the necessary funds must be decided by Government. Such expenditure should not be imposed as a further burden upon the budgets of commercial or quasi-commercial departments."

The note does not make any further reference to that point, but it is really a very important one. The forest department in most provinces is regarded as a commercial department and to a considerable extent our efficiency is judged by our surplus revenue over expenditure. If therefore the forest department should enthusiastically take up schemes for improving fodder and grazing, it will cost money, but will not produce revenue and it would automatically reduce the criterion of its efficiency. I think if it is possible to follow the analaogy of the fodder operations, the cost is never debited against the various commercial department budgets but it is shown under a separate head. If something like that could be done for any work undertaken by the forest department in improving fodder or grazing—which is not commercial—it would have considerable effect and enable the forest department to take up schemes with greater freedom. The question as to who is to provide these funds is a very big matter. It has already cropped up in this conference and I will refer to it again briefly later on.

Turning now to the other waste lands, such as usar, ravines, the rocky hills of central India, the shamilat and village grazing grounds generally—

these by their very size alone are extremely important and they have to bear the brunt and the burden of grazing of India and at present, I think, practically everywhere, there is no control and no method of management over them. They are generally of the dry type and therefore the primary problem is identical with similar type of dry lands under the forest department, that is to say control the grazing and improvement will result, and without control no improvement is possible. I should like to emphasize that both in forest areas and other areas if we are to have control, further research and investigation is very necessary to ensure the best results, for example the improvement of better fodder grass was mentioned by His Excellency the Viceroy in his opening speech. But without control nothing can be done because if you introduce fodder grass and if they are to have a chance of survival, control is a fundamental factor. When we turn to consider the agency of control over these waste lands which do not belong to Government we are up against one of the most important and difficult problems of this conference and I have at present no solution for that. I think it is obvious from the very scale of these areas that direct Government action is not possible, as I have suggested, in the case of the Forest Department. I would like to give an illustration to show what a gigantic scale it is. In the United Provinces the Forest Department have careful plans and estimates and schemes for producing fodder in famines and if a calamity struck the province and we were told to go all out and produce what fodder we could possibly do, the total in the season would be about 50,000 tons. You can visualise what a gigantic haystack it represents. Put that way, it seems quite a lot but if we look at it in another way it does not come to much. It will supply the cattle population of the province with fodder to keep them going for about 8 hours because it works out to about 2 seers per head. My point is that if the Forest Department with all its resources working for months can only produce a few mouthfuls of fodder per head of cattle, it is not possible that Government, acting directly on other waste lands where there is no Government organisation, can do anything which will have a serious effect on the total fodder requirements of the province. That improvement will follow from any sort of control is evident. As an example, I will mention the experiment of usar, which is noted in the report of the Madras Conference which was carried out in the United Provinces on scientific lines and we found that closure to grazing in the rains with uncontrolled grazing afterwards increased the fodder supply about five fold. It is a steady increase from year to year. Similar evidence of improvement is available from ravine lands both in the Punjab and in the United Provinces and in other provinces on different types. I think that this problem also will have to be tackled on a provincial scale and therefore it will be best for the Fodder and Grazing Committees in each province to explore the possibilities and examine other agencies, the work of Government being limited to possibly two administrative areas in selected localities. I would just refer to one more point in the note. On page 2 it says : " These Committees will undertake the reclassification of waste lands outside Government forests." I do not think it is a practical proposition for the Committees to undertake that reclassification. That is essentially a matter for the Revenue Department working through the Patwaris and on the Patwaris' village maps. They could guide how it should be done but I do not think they can themselves do it.

Finally, we come to surplus cultivated land. To a great extent this overlaps Item 4 of the Agenda and I think both these items will have to be considered together. I am therefore only making one point now. In addition to growing fodder crops, I would urge that the possibility of growing tree crops should also be considered. These tree crops for fodder will supply green leaf fodder. In several parts of the United Provinces and in other parts of India the Forest Department have a considerable experience with the system of forestry-*cum*-agriculture, which is called Taungya. Attractive land is given out to cultivators to cultivate their own rabi and kharif crops and they are supplied with seed of suitable forest species which they sow in lines of 15 or 20 feet apart. As they attend their crops, they also attend these seedlings. After three or four years these seedlings grow up to a considerable height and the cultivators take out fresh lands and so the process goes on. His Excellency the Viceroy himself has suggested that between the lines of fodder trees it would be a good idea to sow a good species of fodder grass and we hope to try out that experiment with grasses of selected species. These plantations, in addition to producing fodder, have another advantage which is shared by no other alternative. They also produce fuel which will be available for replacing cow dung as manure, at least to some extent and therefore making more manure available for the remaining cultivation.

I would summarise the four suggestions that I have made so that the Conference can have definite points to discuss. If you, Sir, and the Conference approve, these suggestions might be incorporated in the final resolution.

(1) Forest areas. The initiation and control of further measures of improvement should be left to the Forest Department to whom the Fodder and Grazing Committees in each province would make recommendations and help with advice. It must be recognised that no improvement of grazing is possible without the voluntary co-operation of the people.

(2) Other waste lands. Improvement is only possible where grazing can be controlled. Government activities should be limited to demonstration and advice and, for a start, in selected areas. But Fodder and Grazing Committee should explore all possibilities of successful control by other agencies.

(3) Surplus cultivated lands. The Fodder and Grazing Committees should also explore the possibilities of growing fodder plantations as well as fodder crops by the agency of zamindars or otherwise.

(4) Finance. Funds will be required for these works of the Forest Department. They should not however be imposed as a further burden on the ordinary commercial budget of the Department but could perhaps be made available under a special head of the budget.

Finally, Sir, may I close with an appeal. As this item no. 2 of the agenda is at present very largely a matter of further investigation and research, as His Excellency the Viceroy stated in his opening speech, might I suggest that it deserves the special and sympathetic consideration of the Imperial Council of Agricultural Research for the next few years as I believe that on this depends to an appreciable extent the possibility of

definite action being taken for the improvement of grass lands and the better utilisation of waste and surplus lands for fodder production in all provinces.

The Hon'ble Nawab Khwaja Habibullah Bahadur : On a point of information. May I know if there is going to be one resolution on both the items, items 1 and 2 ? If this is a constituted meeting, may I know what has happened to item no. 1 ?

Chairman : It is, Nawab Sahib, a very much constituted meeting ; it is not a rabble meeting. The idea is that after all these four items have been discussed, resolutions will be drafted and they will be circulated to the members of the Conference. I think your fears are quite unjustified.

The subject is now open to discussion. I am afraid I shall have to apologise to the Conference that I shall be absent for a short time as I have to attend a meeting of the Executive Council. In my absence Mr. Hydari will take the Chair. The subject is now under discussion.

Dr W. Burns : Sir, In dealing with grass lands, there are two factors to be considered. The first is whether there is any soil at all which will produce some kind of grass and the next point is whether there is any grass land at all which can be altered by altering the environment. If one can alter the environment, then one can change both the quantity and the quality of the grass. The environment may roughly be classified into three big sections, namely, the climate, the soil and the grazing animals. Climate we cannot alter, but the climate does determine the kind of grass land which we are going to have. In each part of India we have six months of dry season and the grass land is of a type which has got to remain practically dry for that part of the year. Now, that means that it is not a typical pasture land as it is understood in other countries. On the other hand, it does produce grazing for six months in the year and parts of it produce an enormous temporary excess of grass particularly if the rainfall is good. This brings in another point which has not yet been mentioned and that is that along with any agricultural programme you do need to have some programme of consideration of the surplus grass. It may be interesting to note that fifty years ago Duthie in his *Fodder Grasses of Northern India* recommended the use of sillage, and although we have done a good deal, there is still a tremendous amount of propaganda to be carried on before this becomes a general part of any grass programme. With regard to the soil, that again can only be affected very slightly. In most cases it is not worth while doing much more than very simple bunding. But the soil can be affected and is affected most by the third factor, *viz.*, the grazing animal ; and if one watches the villages hard going out to graze in the early part of the monsoon, one sees very easily what happens. The grass has just begun to grow ; there is nothing more than a faint flush of grass ; the ground is soft, and the herd wanders widely. You get the ground trampled upon and pounded. The young grass is pulled out by the root. Only the palatable grasses are eaten and the unpalatable ones left, and in the last stage, no grasses whatever are left. Then, what is of the most extraordinary importance, the soil is swept away ; in other words, there is erosion and that is a factor to which attention has been given in certain parts of India but not nearly enough : and any grass land programme has got to take into

account that not only is a good grass land programme going to produce more food for cattle, it is also going to prevent erosion and flooding, it is going to raise the water level in the wells and generally speaking it is going to be a great national improvement apart from the effect on cattle As the aims of our programme, there ought to be more and better grass, the gaps have got to be filled up, and the yield has got to be increased. Then, the species have got to be palatable and they have got to recover quickly from grazing. All these changes can be effected. The experiments of which I have most close experience have been carried out in the parts of the Bombay Deccan with about a 20 inch rainfall. Most of these experiments have been carried out in collaboration with and in land under the control of the Forest Department in scrub jungle because it was only in that kind of place that we could get adequate control. One experiment was carried out for seven years in very poor land lying between villages. It was not waste in the ordinary sense. It was a piece of ground belonging to an individual but it was so little worth his while looking after it that it was just part of an enormous expanse of poor grassland. On that very poor soil we were able in seven years to improve the yield of good grass from 300 lbs. to about 2,000 lbs. per acre. In an area which was one of the forest areas, the improvement was from 1,000 lbs. to about 4,000 lbs. As regards grazing, whereas in the beginning it required 40 acres to feed 20 cattle, in the end it required 24 acres after five years to feed these 20 cattle. In both these cases there was nothing except control of the grazing animals and a very small amount of stopping of the run off of water. In both cases not only was there this increase but there was also an improvement in the species, and the better grasses that were more palatable and nutritious replaced to a large extent those that were less palatable and less nutritious. The better the soil, and the better the rain-fall, the quicker is the improvement. Any committee starting a programme should not tackle as its first effort the very worst grazing lands in its neighbourhood. In their case there is bound to be a long, long time before there is a recovery ; on the other hand, grass lands that are not so far gone recover very quickly indeed, and it is well to start with a success. Mr. Smythies has mentioned and the figures have also shown that it is not mainly a forest problem. The forest people are in the fortunate position of being able to do a great deal more directly than those who have charge of or are connected with lands outside the forest and to that extent forest co-operation is invaluable. At the same time in areas outside the forest also this kind of thing can be done and that voluntary co-operation that Mr. Smythies has mentioned is possible. There was one striking case in a village near Nasik where for over 30 years people have set aside a portion of about 100 acres for grass-cutting. One can see that plot from miles afar on account of the golden yellow of the grass that it carries. Now that is a case where some village genius started this system many years ago, with the result that there is no lack of grass there although the surrounding land is as unpromising as any. That shows what can be done. It is amazing the amount of knowledge that we already have in India with regard to the improvement of grazing lands. Starting with Duthie fifty years ago there has been a continuous succession of people working on this from all points of view. There is a great deal of work being done by botanists here and there in Madras, the C. P., Bombay, the Punjab

and so on. We have now in addition an enormous amount of information available from America, Africa and chiefly enshrined in the abstracts produced by the Imperial Bureau of Plant Genetics (Herbeage Plants) and you have got a great deal of practical experience from grass farms, from the military dairy farms and from all sorts of experimentation. Now it is a great pity that that work should continue to be spasmodic and that that information should continue to be scattered, and I think there is no doubt that fodder-committees constituted in the proposed ways should help greatly to bring together that information and to substitute some kind of planning and co-operation for the present very scattered efforts. If it does only that, I think it will have done a very great deal and for that reason I think these fodder and grazing committees are essential and I think this Conference will unanimously propose that we should make certain that a recommendation to that effect goes out.

The Hon'ble Sir S. T. Kambli : What is meant by surplus land which we find mentioned in the agenda ?

Mr. E. A. Smythies : I understood that to mean land surplus from cultivation, from land fit for cultivation or under cultivation.

The Hon'ble Sir S. T. Kambli : That is, surplus land available for fodder cultivation ?

Sir Bryce Burt : Land at present not under profitable occupation.

The Hon'ble Sir S. T. Kambli : Waste land ?

Sir Bryce Burt : Not necessarily waste land.

Khan Bahadur Nawab Chaudhri Mohammad Din : Dr. Burns has made suggestions which, if carried out, will go a long way to effect an improvement in our pasture lands. In Jodhpur State the area under grass farms at present is 15,000 acres and we are taking steps to allot 7,000 acres more. The services of a Marwari graduate of the Wye College, London, have been secured as an assistant under our Director of Animal Husbandry and a systematic investigation of the possibilities of the huge waste areas in the State as producers of fodder is being undertaken. There is a proposal to set up a fodder and grazing Committee in the State, comprising the Directors of Animal Husbandry, the State Forest Officer and the Hawala Superintendent (the Chief Revenue Officer). The statistics of *usar* experiment given in the appendices to this note are instructive and indicate the vast possibilities of the better utilisation of waste lands and improving fodder supplies of the country. However, in parts of the country where the average rainfall is very low, we find no grass at all in waste areas. In the Chenab colony in the Punjab 25 per cent. of the area allotted in each Abadkari village was reserved as *chiragh* (grazing land) and in other Punjab colonies also a certain portion is earmarked for that purpose and although the land is rich in quality, no grass grows. I hope my friend the Honourable Chaudhri Sir Chhotu Ram will be able to devise means to improve those *chiraghs* for the benefit of the country.

The Hon'ble Mir Bandeh Ali Khan Talpur : The question of grazing problems in Sind was thoroughly examined by the Cattle Supply and Improvement Committee presided over by Mr. H. Dow, former

Revenue Officer, Lloyd Barrage and Canals System and now Secretary to the Government of India. This Committee met in the year 1928 and considered the grazing facilities in forest and waste areas of Sind.

Grazing in Forest Areas.—This Committee found that the total area of Sind forests was about 7½ lakhs of acres and the total revenue derived from grazing in these forests was about Rs. 40,000 or about 10 pies per acre. The forests are mostly massed in the riverain areas, and there are few inland forests of any great value for grazing. Even in riverain forests most of the cattle grazed belonged to professional graziers and only a small portion of the cattle belonging to cultivators living near the forest are grazed in the forest. The present grazing available in the forest is more than ample for the cattle that take advantage of it, the acreage available per head being 19 acres and the grazing being of excellent quality. The present charge for grazing in forest is 6 annas per head of horned cattle per year, while the professional graziers or maldars took full advantage of these grazing facilities. The Committee further found that the paucity and poverty of inland forests in Sind was a great drawback and something should be done to supplement grazing in areas remote from the riverain forests. They recommended wide belts of babul trees to be maintained along the banks of canals and distributories and small reserves (of from 150 to 250 acres) in convenient centres to be maintained for the growth of trees and grazing, by the P. W. D. No action has been taken but the matter will soon be taken up for further examination under the present conditions.

Before leaving the subject of grazing in forest areas, it may be mentioned that Government have given concessions in the matter of levying very light assessment to encourage establishment of private woods (or huris) on zamindari lands which provide valuable fodder in the form of leaves and pods and also grazing ground. For the first ten years light grass rate is charged and in order that this concession may not be abused it was suggested that only five acres of these private woods or huris should be allowed to every 100 acres of holding. Private owners, however, have not taken much advantage of these concessions made by Government.

In view of perennial and assured supply of water on the Lloyd Barrage canals, most of the unoccupied culturable land has been and is being taken up for growing cash crops in the Barrage areas leaving little surplus land for grazing of cattle as in the pre-Barrage days. But in the non-Barrage tract served by inundation canals, there are large areas of unoccupied waste land available for local maldars and zamindars. The Government of Sind propose undertaking an investigation as regards area actually available and water supply of such tracts in order to encourage raising of fodder crops by a system of dry farming known as Bosi cultivation and also the possibility of establishing ' babul ' huris in such areas as the latter provide valuable fodder for cattle.

In the hilly areas in the vicinity of Karachi, natural grass production depends on the amount of rainfall—the last few years have been marked by the deficiency of rain and consequently reduction in the supplies of natural grass for the cattle. Government propose to examine

the character of the vast plains lying in these tracts as regards their contour levels and the types of natural grasses grown with a view to introduce a system of " Bund Barani " cultivation which involves bunding and terracing with a view to store rain water into the soil as much as possible instead of allowing it to run waste and also to introduce a system of artificial seeding of the best types of natural grasses, if found practicable. At the same time it is desirable to examine the underground water supply in these areas and to find out if springs of sweet water useful for cultivation of fodder crops exist in the vicinity of Karachi city.

Dr. R. Maclagan Gorrie (Punjab) : Sir, Dr. Burns has already introduced a subject which is very near to my heart, namely, the enormous destruction that at present is going on practically all over the country, through the neglect of land as a whole. The conservation of the soil is obviously the basis on which the whole of the agriculture of the country is built up, and the subject we are dealing with at present, namely, fodder production, stands or falls by the conservation of the soil. At present the soil is not being conserved ; it is being grossly neglected over practically the whole of India. The amount of destruction is more visible and more obvious in the foothills districts and the more steeply sloping land. But the amount of serious loss of soil even on the more level lands has not yet been realised. Therefore, although the remarks I wish to make apply directly to the steeper lands and the foothills, they do apply also to a very great extent to all the more level lands.

(At this stage the Honourable Kunwar Sir Jagdish Prasad resumed the Chair.)

The amount of farm land which at present is being destroyed through neglect is very alarming indeed. To quote one instance alone, in the Jhelum district of the Punjab during the last 36 years that district alone has been losing 2½ square miles per annum of cultivable and cultivated land through torrent action. It is a very serious figure indeed. How is that destruction taking place ? To get to the bottom of this we have to go to the top of each catchment area. The water accumulates in these streams from the higher grounds, from the foothills which are very largely uncultivable. How do the floods arise ? They arise very largely through the fact that nature has been absolutely flouted in her efforts to keep these steeper lands under some sort of plant cover. By destroying that plant cover through persistent and much too heavy grazing, the land is left exposed and every storm simply sweeps it down into the rivers below. To quote actual figures, figures have recently been published in " Current Science " and in the " Indian Forester " from actual measurements of run-off which have been collected largely by the irrigation branch and partly by the forest service. There is a long low range of foothills opposite the Jhelum called the Pabbi,—an inconspicuous range of hills hardly 600 feet above the river. But the behaviour of the individual torrents which rush off from the steep ground has been correlated absolutely exactly with the amount of grazing which has been going on. There are roughly four classes of land within this range. There is a comparatively small area in which we have been doing counter-erosion and afforestation and the building of bunds and what the

Americans call gully-plugging, over a long series of years. The run-off from that particular area is only 100 cubic feet per second per square mile. The next best type of ground is that which is under a passive protection of grazing. It is a nominal closure. It is not quite complete ; it is more or less closed to grazing but open to grass cutting. The run-off from this is 600 as compared with 100 cubic feet per second. The third class is ground which has been very badly overgrazed. Nominally it is under the protection of the Forest Department. The run-off from this ground is 1,000 cubic feet per second. The fourth and most seriously type damaged, although the topography is absolutely identical, is ground which unfortunately was left out of the original forest settlement, and for the last 50 years has been very heavily grazed by buffaloes, etc. And the run-off from that is 1,600. So you have four figures,—100, 600, 1,000 and 1,600. I do not think you could have wished for anything more convincing to show the tremendous danger which over-grazing is bringing about, particularly in connection with the damage which is done very much further down the streams and to the layman cannot immediately be correlated with the damage in the foothills. The figure of 2½ square miles of destruction in Jhelum can be shown as the direct result of gross neglect of the catchment areas such as I have described for the Pabbi hills. What are we going to do about it ? We have vast areas of this type of country, in Punjab partly under forest protection. It just happens that we have a few boundary pillars round ground which accidentally has been classified as reserve. Originally it had forests on it and that explains the presence of the pillars. But the present condition of the ground is almost equally bad, whether it is inside or outside these pillars. The answer is of course that the grazing has been uncontrolled, and through uncontrolled grazing the Forest Department has been left absolutely helpless and ineffective, and has failed entirely for that reason to conserve the land for which it is responsible. This does not by any means apply to all forest areas but in the Punjab at least there are very large areas to which this remark applies. The Forest Department cannot I think be held morally responsible for the amount of destruction because we were handicapped from the beginning by the forest settlements to which Mr. Smythies has already referred. The cure which Mr. Smythies has outlined is primarily legislation. I think all of us who have any practical experience of the problem realise that legislation is badly needed. But, Sir, at the moment I do not think we can expect the provincial Governments to face up to this fact. Gradually I hope the voice of the people will in time make itself felt and that the legislation will come about in a normal and quiet and slow manner without causing any revolution or disturbance. At the moment if repressive legislation of that sort were put through, there is no doubt that disturbance would occur. Under the circumstances we cannot expect the provincial Governments to undertake that. What is the alternative ? The alternative is to put on a sufficient number of knowledgeable officers with a sufficient amount of drive and organising capacity to help the villagers to organise themselves in this direction. As an example of what can be done we have three areas in the Punjab in which Deputy Conservators of Forests have actually been detailed to carry out such work. In Hoshiarpur the officer there has been instrumental in obtaining voluntary closures and rotational closures to the extent of 70,000 acres in two years.

It is a very large tract of country to be suddenly changed from bare and eroding and rotting hillsides to turn into good grass, which grows very quickly indeed, purely through protection and closure as Dr. Burns has pointed out. Similar work has been taken up more recently in the Jhelum district by another officer, and the results he has obtained there may in a few months' time be even more surprising than in Hoshiarpur. But these are only two isolated instances. What is needed is a similar type of officer, not necessarily a forest officer, but someone with technical training in soil conservation and flood control and fodder production which is obviously the outcome of such control. We need these officers all over the place. We need one for each district almost throughout the Punjab depending upon local conditions. These officers so far have been working entirely independently, but we hope as a result of this conference to get the local sub-committee actively working, and the obvious line of control will be that the officers working in each district will work with the sub-committee. One question which has already arisen in my own experience is the difficulty of getting funds for such work. The Forest Department provincially is not directly represented on the I. C. A. R. and therefore it is not able to put forward its own proposals for a conservation project. That has been the position as far as my personal work is concerned, but there are obviously several methods of approach. One possible line of approach is through the local standing sub-committee as soon as it is formed as it, I presume, will have direct access to the I. C. A. R. to present any proposals for which they think central funds might be justified.

In closing, Sir, I should like to emphasise that whatever soil erosion control and soil conservation work can be undertaken, in many cases the villagers themselves have a very good practical working knowledge of what should be done, and in many parts of the country you find isolated instances showing what has already been done by individuals. The knowledge is there ; what is needed really is some organized driving force to get the village communities to take up this work voluntarily.

The Hon'ble Sir S. T. Kambli (Bombay) : Sir, I am in perfect agreement with what Dr. Burns said as regards the steps to be taken to improve the quality and quantity of grass in India, but there is another side of the question which has not so far been touched in the discussion. and that relates to the question of grazing fees. In the Notes supplied to us on this subject, the question of grazing fees has found a very prominent place. It has been observed in the Notes that the fees for grazing are simply a token amount bearing no relation to the economic value of grazing, and it has further been observed that the low fees charged encourage the survival of a large number of uneconomical animals. With regard to the question of grazing fees, I have to bring to the notice of this conference that there is a widespread discontent in the Bombay Presidency as to the rates charged by way of grazing fees in that presidency. In Bombay we recover an amount to the tune of 5 lakhs per year by way of grazing fees, as compared with Rs. 20,000 in Bengal, Rs. 18,000 in Burma and about Rs. 1½ lakhs in U. P. The only province in which a similar amount approaching the amount levied in Bombay is charged is Madras, and I find from the figures I have been able to collect that the Madras Government levy an amount in the neigh-

bourhood of 6 lakhs per year. Sir, I am not at all convinced that the fees for grazing are simply a token amount as observed in the Notes. We have to consider the capacity of the agriculturists to pay the same. In the first place, we find that in Bombay there are a large number of villages which have contributed for the making of forests, and in such villages even a small amount of fees presses very heavily on the agriculturists themselves. Therefore, what I do submit is that the question of grazing fees should be left to the provinces concerned. As I said, in my presidency, there is a wide-spread discontent as to the grazing fees that are levied there, and the Bombay Ministry has published a programme in which they have made it clear that they have decided to give a remission in grazing fees in the Presidency. What I do propose is this, that the question of grazing fees should be left to the province themselves, because the conditions in different provinces differ very materially, and while it may be true that in the case of some provinces the amount of grazing fees can be treated as merely a token amount, in other provinces that amount presses very heavily on the agriculturists. Therefore, Sir, I do wish to bring to the notice of this conference that this question of grazing fees should be left entirely to the provinces themselves.

The Hon'ble Raja Maheshwar Dyal Seth (U. P.) : Sir, in his admirable speech Mr. Smythies, pointed out that the chief source of supply of food for cattle everywhere must be the grazing land under forests, and other waste lands and surplus land or agricultural land on which fodder can be grown. The land under forests serves only a very small fraction of the population. In the U. P. where the area under Forests is a little over 6,000 sq. miles, the area actually available for grazing is just a little below 3,000 sq. miles. I feel certain that legislation will be necessary to overrule the present forest laws which have deprived the cultivators and their cattle of a large area of grazing ground which should have been available to them. That is a very big problem no doubt and it is fraught with great administrative difficulties, but there is no reason why it should not be tackled satisfactorily. More important than the question of improving the grazing land in forests is the question of other waste lands. The total area in our province for waste lands is 23,000 sq. miles as against 8,000 sq miles of the forest, all of which cannot be made available for grazing, but a good deal of that can certainly be made available for grazing. 8,000 sq. miles of this is Usar land and the experiments recently carried out in some of these Usar lands have shown that merely by closing the area for grazing during the rainy seasons the yield of hay has increased from 2.75 maunds to 15 mds. per acre, and we want improvement for production of more hay on the waste land. These waste lands which are available for growing hay and the area under forest which is available for grazing do not solve the problem, and we must have a much larger area for grazing before we can solve this problem to any appreciable extent. I will come to that a little later. But I feel certain that the chief means of sustenance for our cattle must be the surplus agricultural land and fodder. That alone can solve the problem to an appreciable extent. What is needed, I think, is some legislation to reserve an area in order to make it common pasture land. This of course will increase the burden on the land which is already very high, and when our cultivators cannot grow enough food for themselves, it is rather difficult to expect them to leave a good deal of that area for the growing of fodder for their cattle, but what I feel is,

improvement in the general condition of the masses must precede any improvement in the general condition of the cattle. When the masses themselves are half-starved, it is no wonder that their cattle are deteriorating and are bound to further deteriorate ; when they cannot find enough food for themselves and for their children, it is idle to expect them to feed their cattle better. Therefore, we certainly want more common pasture land in every village on a compulsory basis, rather legislation should be adopted to bring under control more common pasture land, and then when we have less land available for agriculture, the bringing into cultivation of high yielding varieties of crops and the adoption of better standards of cultivation will enable the existing production to remain almost the same as it is in a larger area. It has been suggested by one or two speakers that we should not do anything by compulsion, and the best way is to carry on propaganda and adopt persuasive methods. One of the speakers just said that the voice of the people must in itself be felt before any change can be made. I am sorry I cannot subscribe to this view. I think if you follow the methods of propaganda and persuasion, we shall have to wait not for a few generations but for a few centuries before we can find any appreciable improvement in the present conditions. When once you are convinced of the soundness of your scheme and when you feel that it is for the good of the masses, why not go forward with it boldly ? And I feel that if we want to bring about any appreciable improvement, we shall require a Mussolini or a Hitler in India. I am perfectly certain that we shall want legislation to have common pasture lands for the villagers, and to give better rotation of crops means production of more food for the people and more luguminous fodders of a better variety. How that is possible, what better planning of rotation is possible it is for my Director of Agriculture to say, as I am not competent to express any view on it, but I think we must have legislation to have common pasture lands before we can have any appreciable improvement in the methods of providing more food for our cattle.

Mr. Z. R. Kothawalla : I entirely agree with the observations made by Dr. Burns. My feelings all along have been that we have been concentrating too much attention on merely the production of fodder. The production of fodder is no doubt important, but its proper conservation is equally important. We all know that in order to rear good stock there should be an assured supply of fodder throughout the year. One of the methods adopted all over the world to ensure this is to turn into silage any surplus grass. Silage making is not a new thing in this country. In fact, it has been adopted as a regular practice on most of the up-to-date farms. We have also found that silage making is one of the cheapest forms of conserving fodders in this country, and the method is so simple that I think it can be adopted even under village conditions. I am referring to the pit method of silage making. Unfortunately this method is very little known outside of the Government farms. I would therefore strongly suggest that silage making should be introduced more intensively into the villages and into areas which are to be reserved for fodder production as one of the measures for ensuring supply of fodder throughout the year.

Mr. W. S. Read : I think it may be of interest to the Conference if I make a few remarks on what has been happening on one of the largest controlled grazing areas in India. As most of you know, I come from the

Government Cattle Farm at Hissar. It has about 40,000 acres of which 4,000 acres is under irrigation and the remainder is entirely grazing land. The peoples' cattle are kept out and we are therefore able entirely to control the grazing. We move herds of cattle from pasture to pasture at different seasons of the year. I have been there for nearly 18 years and my personal observations are that the grazing area is deteriorating. The Hissar Farm is part of a vast level plain according to the Gazeteer. That term is no doubt relative, it is an undulating country, and although the general public do not realise that erosion goes on, it does go on. When I went to Hissar in 1919, then and in the following years we were getting good grazing and making large quantities of hay and silage every year. Some of those areas have been practically producing nothing now. I went into the matter a year ago with the help of Mr. Mackenzie in the Punjab and we got a scheme for the improvement of our grazing and the best way is by bunding the land, a simple and cheap method. I forgot to mention that the annual rainfall is only about 14 inches of rain, and most of it falls at one time of the year. The soil is very dry and rain falls 3 or 4 or 5 inches at a time. The water goes down the depressions and it produces a kind of coarse grass which is practically useless and worse still, it forms a breeding ground for waterborne diseases for cattle. We decided that if bunds were put up, this would be obviated and a scheme was put up to the Government and I hope I am getting my first instalment of money to start the work in Hissar. This is a simple thing which could be done in other places. There is no need for going in for expensive schemes, but simply put up more bunds to stop the rain running down the depressions. I think this could be easily done in many parts of the country and the improvement in grazing would be great.

Chairman : Has the Nawab Sahib of Dacca anything to say ?

The Hon'ble Nawab Khwaja Habibullah Bahadur : I have nothing to say on this.

Chairman : Sir Anand Sarup.

Sir Anand Sarup : I have nothing to say.

Rai Sahib K. I. Thadani : I wish to bring to the notice of this Conference a certain peculiar condition in relation to the production of fodder which has come about in the barrage area of Sind. As you know, under improved conditions of water supply we expected to grow 27 per cent. of our holding under kharif crops and 54 per cent. under rabi crops. Under kharif crops our original project contemplated that 18 per cent. would grow a cash crop like cotton, and 8 to 9 per cent. would be under cereals and fodder crops. Cereals also provide straw for cattle. What has happened at present ? Cotton cultivation has gone on increasing so much so that almost the whole of the 27 per cent. is being grown with cotton leaving nothing for cereals to be grown there. The agricultural department and other authorities have been trying to use all their personal influence to do propaganda among the people to try and ask them to grow at least 5 to 6 per cent. under jowar bajri, but the result of their efforts has been that they have not been able to change the condition I have described. Similarly, take the rabi crops. We complain of fodder. We are not growing actually 54 per cent. of the area under rabi crops, although we have water supply. Wheat of course is increasing and the whole rabi cultivation is between 30 and 35 per cent. We have water

supply and yet people would not grow fodder crops. Wheat has no doubt answered this problem by the use of its straw and the cultivation of wheat has increased from 3 to 11 lakhs of acres. This matter was considered by the Provincial Board of Agriculture and two very important resolutions were passed unanimously and I would like to bring those resolutions to the notice of this Conference. They are :—

(1) The Board recommends that Government should undertake an examination of the present position and trend of the cultivation of fodder crops in Sind and consider whether any reduction in the assessment of different types of the main fodder crops grown in the province, in either the kharif or rabi season, is necessary to guard against any definite fodder scarcity in the future. In addition, all other methods of encouraging the cultivation of fodder crops and of persuading or compelling zemindars to increase the areas available to their haris for fodder production, should be investigated.

(2) The Board recommends that, with the object of popularising the cultivation of leguminous crops which serve as cattle fodder and, at the same time, help to maintain the fertility of the soil, Government through the Agricultural Department should buy, store at suitable centres in the districts and sell at cost price (over a period of three years in the first instance), a stock of seed of berseem and guar in small lot to zemindars who are not accustomed to these crops.

Actually some action has been taken in that direction and finally a report will be submitted. In the same matter it has been brought out whether the increased yield of certain staple crops due to the use of new high yielding varieties should permit land to be released for increased fodder cultivation. I may mention that this is not quite so hopeful owing to the land tenure system where the land belongs to the zemindar and the farmer is an annual tenant sharing the produce with the zemindar. The owner of the land is not interested in the cultivation of fodder crops which do not bring him as good return as the money crops. Unless there is a legislation fixing the proportion of fodder crops to cash crops, any act of persuasion and propaganda is not likely to meet with great success. At the same time, public opinion is not in favour of such legislation.

Mr. T. A. Whitehead : Mr. Smythies and Mr. Burns have put the matter very clearly and I am in entire agreement not only with them but also with the other experts who have spoken on the subject. But as the time is very limited I shall be brief. In the Madras Presidency the problem of the control of grazing in reserved forests is a very much more simple matter than that in the U. P. as detailed by Mr. Smythies. In the Madras Presidency there are certain rights over small areas, but taking the matter as a whole, we are not encumbered by them to any great extent and this can be put right in the Madras Presidency by an executive order by the Madras Government. Prior to 1924 our Reserved Forests were divided into small grazing blocks and we issued permits to graze in the blocks and we were able to regulate and limit the grazing. After 1924, owing to agitation in the Legislative Council those permits which were valid for

one block were extended to a whole range which amounted approximately to 100 square miles or 64,000 acres. Later, owing to further agitation, this was still further extended to a whole district which may represent roughly 700 square miles or half a million acres. It is quite obvious in these circumstances that it is impossible to control grazing and this robs us entirely of any hope of control over grazing in the reserved forests. At present any one can apply for grazing permits for any number of cattle and graze his cattle wherever he likes within the district. There is no hope of improving the grazing lands in these circumstances. What I have said applies to the 16,000 square miles of reserved forests under departmental control. We have also in the Madras Presidency 3,000 square miles under panchayat management which is controlled by the revenue department. In order to make the best of our resources it is necessary to make adequate provision for water, to divide the forests into convenient grazing blocks and to introduce rotational grazing, necessitating periods of closure as well as the limitation of the number of cattle. The need for these measures has been considered, recognised and acknowledged by the Madras Government, and as requested by the Government of India, the Hon'ble Minister for Development to the Madras Government is prepared to state now before this Conference what the result of their consideration has been in regard to these points.

The Hon'ble Rao Bahadur M. C. Rajah : Mr. Whitehead has now given to the Conference a short history of the system of grazing in the Madras Presidency and has also explained the system now obtaining there. I need therefore only confine my remarks to the specific recommendations of the Madras Conference. I gather that the Conference, or, at any rate, the Government of India desired to know what decision the provincial Governments have come to on these recommendations. I may say that the Madras Government have accepted all the four recommendations in Part I of the Committee's Report. We expect that there would be an outcry against the restrictions proposed in recommendation (3) in regard to limitation in the number of cattle utilising the grazing and in the period of utilisation in so far as forests under departmental control are concerned. Such restrictions are already in force in reserve forests which are under panchayat management and known in Madras as " ryots' forests " and we hope that the ryots will in course of time realise that it is to their good that these restrictions are extended to the forests under departmental control also. Provided therefore the Legislative Assembly approve the change in policy involved in recommendation (3) and vote the funds required for carrying out improvements in the forests, we are prepared to implement these recommendations.

There is not the same amount of difficulty in regard to reserved forests under the ryots management. In this case the ryots themselves are under an obligation to effect improvements. There was a Government staff whose duty it was to go about inspecting these forests and indicating what improvements they were to carry out and how it was to be done. Unfortunately, owing to need for retrenchment, we were obliged to abolish the staff. But now it is our intention to revive these appointments or at least 50 per cent. of them even from this year if funds would permit. With these posts revived, the Madras Government hope that it would be possible to effect improvements in these forests both in respect of water facilities and the quality and the quantity of the grass provided in them.

As regards waste land, we are not very hopeful of finding land suitable for grazing on any scale worth mentioning but propose to have an investigation made into the matter. Wherever we find suitable blocks we intend notifying them as reserved land and handing them over either to the Forest Department or the panchayat for efficient management.

We also agree to the appointment of a Standing Fodder and Grazing Committee for the province and this committee, I need hardly say, would welcome advice from the Grazing Sub-Committee of the Imperial Council of Agricultural Research.

Mr. F. Ware : As a result of informal discussions and also from the discussions that have taken place this morning, I have gathered that some provinces and States consider that this subject really does not affect them very much. I think that is because the actual forest grazing available in those provinces is comparatively small. I think it might interest the whole conference if I gave them some figures showing what our fodder resources are in this country, and what an enormous problem it is to try and feed our animals. These figures show that in the matter of straw and what is usually called roughage we have an amount which varies from about 2.6 pounds in the United Provinces to 4.9 pounds in Bombay per head of bovine population per day. In addition to that if we take all the areas which are set aside for the growth of special fodder crops we have an extra half a pound of green fodder available and in addition to those two items we have, if we exclude Assam, which is particularly fortunate in the matter of grazing, about half an acre of grazing land available. If we consider that these figures exclude any reference to other animals except cattle, if we remember that only a percentage of these animals can get concentrate and if we try to visualize what that half an acre of grazing land is like at the present time for at least half the year, it will give us some idea, I think, as to why our cattle in this country are so degenerate and what an enormous amount of work we have got to do in order to fill up that hiatus. I suppose these provinces which are at the present moment not particularly interested in this question of grazing are taking as their sheet anchor the increased production of fodder crops. Of course that is a very important subject and we are going to discuss it later but at the same time I think it must be obvious from the figures produced that it is necessary for every province and State to make as much use as possible of all the available land which could be used for grazing and as you have heard it amounts to something like 45 per cent. of the total area in British India. In regard to this 45 per cent. of land there is of course a certain amount of difficulty in understanding exactly what is meant by it but no doubt this Standing Fodder and Grazing Committee will take up the question of reclassification and we have just heard from the Honourable Minister from Madras that he has not much hope of improving these lands but on the other hand we heard from some forest officers how much can be done by the simple method of bunding. In any case it is most important, I think for us to try and face the position as it actually is in this country and in that connection I would refer to two points. The first point is that grazing facilities for our young stock are essential in any case, but more particularly if we want to produce good bullocks they must have grazing land and exercise land and there is no reason why our exercise land should

not be made grazing land, and the second point is that even in those provinces which do not appear to be interested in the question of grazing at present there must be large areas of land where the question of growing fodder crops for cattle is very difficult at present and is likely to remain so for a good many years. As I visualize the position, it is this. Where cultivated lands are concerned, our livestock have got a competitor in the shape of the human being and the ryot has got to decide if it is going to pay him better to grow fodder crops for his animals or crops to feed the human population. He has got to decide whether he can afford to set aside any land for growing fodder crops for his animals. On the other hand, in regard to grazing areas our livestock have no competitor. That is a very important point for us to remember. This 45 per cent. of the total area amounts to something enormous and if we can improve the grazing of that large area, even by a very small amount—I am not going into the details—it will provide us with an enormous increase in our fodder for our livestock.

Mr. C. F. Bell : I can speak with some knowledge of this subject, as I was one of the pioneers of grazing settlements which were started in Government forests of the Central Provinces about 25 years ago. I have also dealt with many of the more recent settlements which have passed through my hands as Conservator and Chief Conservator. The C. P. Government forests are free of all rights of user and even so the imposition of restrictions of grazing incidence and periodic closures to grazing have met with considerable opposition and have been very difficult to introduce. It will be useless to attempt such settlements in Government forests elsewhere unless the Forest Department has full control, and this will often mean revision of the forest settlements in the first place.

The waste lands in the Central Provinces, utilizable as grazing grounds, cover approximately 25,000 square miles and are, for the most part, privately owned. Legislation will, therefore, be necessary before any steps can be taken to improve the quality of the grazing by periodic closures.

It is quite true that this question bristles with difficulties but it is well worth while attempting to introduce some form of control of grazing, both in Government forests and waste lands which respond very rapidly to rational treatment. I have seen the vast improvement which has taken place in the quality of the grazing grounds of the C. P. Government forests as the result of the measures started in 1912 and believe that it will be possible to effect similar improvement in the waste lands. I am encouraged in this belief by the success which has attended the powers vested in the Local Government by the Central Provinces Land Revenue Act to deal with forest growth in waste lands in Malguzari villages. When I first joined the service, the officers of my Department were inclined to scoff at what they considered the quite inadequate control and management of forest growth in these areas and to predict that the malguzari forests would disappear in 30 or 40 years time. Thirty-two years have passed and these forests are still there and not much the worse for wear. In fact, in some districts, they are serious competitors of the Forest Department in the sale of forest produce. And if we have been able to deal with this satisfactorily, I think something might be done as regards the pasture and I support this proposal to have this committee which will co-ordinate

the work done in different centres. It will be probably found useful elsewhere. I have made a deep study of this matter for a good number of years.

Mr. B. K. Badami (Hyderabad) : While discussing this subject, I think the opinion of a farmer who has been looking after farms for the last 15 years may be useful. We have some encouraging results in Hyderabad. We have a grass farm that came as legacy, owing to the evacuation of one of the cantonments. This has been a grass farm for the last 100 years or more. It has never failed us, as far as I know, and the yield during the last 25 years has not lessened either. Perhaps it is due to the simple operations carried on this farm. A little control in grazing is necessary and I feel that once you have some control, the growth of pasture is a very easy affair. I am an amateur farmer who has been carrying on this work. All that we do is

1. We do not allow the scrub jungle to be destroyed.
2. For six months the farm is closed to cattle for grazing and after harvesting our hay the stubble is leased for grazing.
3. The villagers are not allowed to take the droppings of the cattle from the area.
4. Every second year the stubble is burnt just before the monsoon and this has a beneficial effect.

The simple methods which we adopt have been very helpful to us. In the grass areas of the forest department—the district forests, and as we call them famine reserve ravines (grass lands), the yield of hay per acre has been between 800 and 1,000 lbs. or 1,200 lbs., whereas in our farms it has never been less than 2,000 to 2,500 lbs. per acre. The Hyderabad Forest Department has been carrying on experiments in various areas as to how improvement could be made. They are constructing wells and bunding ravines for conservation of water. This work was started a couple of years ago. It was suggested by a speaker here that a certain amount of land in every village should be reserved for grazing purposes. In practice however this does not appear to be a workable proposition, because the demand from people for land for agricultural operations is great. We had similar orders passed in Hyderabad about 20 years ago that in every village, 25 per cent. of the lands should be kept as cattle grazing areas. The demand was so strong that the revenue authorities could not always prevent land being given for agricultural purposes. It is also a good thing, I think, because in those tahsils where such lands have been taken away for agricultural work, I find that the useless cattle one generally sees in villages are lessening and only useful cattle are maintained, such as cows and buffaloes for milk and working bullocks and the ryot knows enough that he should have some fodder for these otherwise he would be nowhere. The villager naturally finds that he should grow such crops as would bring him more money. I wish to tell the conference a recent experience we had in Hyderabad. Last year we had famine in two districts bordering on the Ahmednagar district of the Bombay Presidency—and a suggestion was made and accepted by the Famine Board as of practical politics. There are a large number of wells in the district and Government let the villagers know that all those who would grow fodder for cattle under well irrigation up to the extent of 2 acres

would be exempt from the cess which was about Re. 1 or Rs. 2 per acre. That was said to be a very popular measure and the villagers very much appreciated it. I suggest that such a step should be made a permanent measure, and the revenue authorities should agree to it. It has been found necessary that the forest and the revenue departments should control pasture land. The villagers indiscriminately graze their cattle when there is no control with the result that when famine breaks out, they are helpless. We recently gave fodder for cattle from a Government controlled farm. There is one farm which was able to provide from its reserves eight lakhs of lbs., of baled hay. If we only make up our minds to improve the fodder of pasture lands, and control them, we will not be threatened with fodder famine. We have been adopting measures which Doctor Burns told us how to improve the fodder supply. About 20 years ago, the Pusa Institute very kindly analysed for us some of our best grasses. We have been trying to destroy other grasses by all means available and concerting measures for propagation of the four special types of grasses which have been found to be the best. I think every farmer can adopt these methods and it is an easy matter to improve the pasture with controlled grazing.

Mr. J. S. Garewal : Mr. Smythies in his opening remarks urged the point that these provincial committees could not themselves do the whole work of organizing the improvement both in forest and waste lands. I should like to ask the Conference in framing the Resolution to make it clear that the function of the committee should be mainly executive and not administrative. They may work, they will work through the normal channels, but that if their function is purely administrative, we should get down to the usual routine of the thing being passed on from one office to another and nothing much would be done in the end. As Mr. Ware pointed out one of their chief duties would be land classification and that falls under two parts, firstly make an audit of the present uses of land, in which case, it is merely collecting and correlating the existing information, and secondly regional planning for the future. As Prof. (?) of the Breeding Association pointed out he was suggesting a rough solution and he said that regional planning simply meant application of sciences of botany and economy to the rejuvenation of agriculture. All sciences are based on research work and unfortunately it is a fact in India that research work into the pasture improvement is somewhat deficient at present. I think the reason for that partly has been that there is an enormous amount of difficulty in deciding on any useful method of recording the relative values of different pastures. That is the only other point I wish to make. I think if the Central Institute could take up this point of producing an approved standard method for recording the quality of pastures, it would be very good and I think that can be done only by a central institute and it would be of enormous use to all the provinces and possibly throughout the world because there is that difficulty at present of having no standard method of recording.

Sir Bryce Burt : Sir, there is no need for me to take up much time in summing up the discussion. I think we have enough material now to put forward this afternoon a Resolution or Resolutions which will convey the general sense of the conference. I only want to make a very brief reference to an appeal made by Mr. Smythies. A reference was also made by

Dr. Gorrie to the part which Imperial Council of Agricultural Research should play in the matter of research. In accepting the recommendation that the Council should set up a central committee, we definitely contemplated that that committee would come before the Council in due course with a proposal for funds for research experiments. I may say myself that if any such proposal comes it will have my own support in the Advisory Board and in the governing body. The conference has it in its own hands, because the governing body mainly consists of Ministers in charge of agriculture in the various provinces and the corresponding Ministers in the contributing States so that I think we may be assured that any recommendation of this conference to Imperial Council of Agricultural Research would be thoroughly well protected. That is all I have to say.

Chairman : We had better now proceed to the third item on the agenda because we have been discussing this for nearly two hours. If we wish to finish the business of the day by this afternoon, it would probably be generally agreed that we should proceed with the next item no. 3.

Mr. C. F. Bell : May I suggest that as fodder production is so closely linked up with grass production, it might be convenient to take up item 4 instead of item 3.

Chairman : All right, we shall take up item no. 4.

Sir Bryce Burt : Sir, we put forward this question of crop planning for increased fodder production in order to get a discussion and start people thinking about it and we hope to start people acting on it. It was one of the criticisms of the Agricultural Department in India during the long period of economic depression and low prices that by introducing high yielding rotations of crops, we were merely adding to the cultivators troubles. That, Sir, found expression in the Press not only in this country but in other countries of the world. Every agricultural department was equally subject to the same criticism. Our reply to that was that we were out to increase the efficiency of agriculture and that if land is not wanted for one crop, it was very badly wanted for another. Now, Sir, the position briefly is this. The ascertained area under important varieties of the principal staple crops is 20 million acres and our growth in that area is very considerable. I have been able to give figures for a few of the more important crops, such as rice and wheat among the cereals, cotton, jute and sugar cane and ground nuts among the commercial crops, because we have only very imperfect information as to the area under many other crops. We do not want to indefinitely increase our production, either under cotton or jute or ground nuts. They are the three principal crops where our present production roughly speaking is adequate. If we are going to take full advantage of these high yielding varieties which are gradually extending in cultivation, we must release some ground for other crops. My suggestion is that part at any rate of that land should be used not in other alternative cash crops, but for the better feeding of the cultivator and for the better feeding of the animals. It means there should be actual rotation of crops. The actual change under the cropping scheme is a matter not merely for provinces. Places to make a start obviously ought to be found in those villages where the agricultural department is well established where it has had success and where people know that what the agricultural department says is true. I would like to mention just two examples of what could be done.

We know that we have a most valuable series of fodder crops in *berseem*, *senji* lucerne, fodder juar and fodder maize and such well known pulses as *methi*. If only a small portion of the area was released by the adoption of high yielding varieties of staple crops, they can be used for growing crops of this nature which might greatly improve the fodder of our animals, not only qualitatively but also quantitatively. We are not limited to this particular form of development, wherever there are new irrigation facilities, as for example tube wells, you have added irrigation facilities and more intense cultivation could be undertaken. There also some area should be put under fodder crops so that the cattle may be better fed and so one may start. If one may so put it, you can increase the efficiency of the cultivator and his animals by the better feeding of cattle. My suggestion to the Conference is that in every agricultural department which has now become permanent and wherever you have intensive cultivation developing and wherever you have a large area under new varieties, some definite consideration should be given to crop planning for the greater production of fodder.

Chairman : Now, the matter is open to discussion.

Mr. W. Sayer : We have done at Pusa a considerable amount of work on this question of fodder crops. In 1935 the work was published in the *Herbage Reviews* No. 3 of 1935 by the speaker. In that we referred to the fact that we had tested nearly all the foreign grasses so largely written about and advertised in their own countries and we had also tested a great many other crops of the leguminous type against our own crops grown at Pusa. Our conclusions which I will now read out are as follows. " All our work on foreign grasses has led to the same result. We find that all these imported grasses do well in the monsoon when we have every fodder grass in abundance. None of them is of any value when we have no grass, *i.e.*, in the hot weather and in the winter. In berseem we have the best irrigated fodder crop in the world ". The introduction of berseem in Pusa was in 1917 and we got it first of all from Sind. Before we grew berseem at Pusa, we had to feed the herd and work cattle very largely on 400 acres of highland. We have no irrigation at Pusa. When we got berseem to the area, we took over an area of 120 acres of dhab land, that is to say, the land that is flooded in monsoon and is covered with a thick sand crust. We irrigated that land and on that area of 120 acres we have maintained the herd and all work bullocks with hot weather maize and berseem grown in rotation. We have never manured that land and when we left Pusa last year that land was stronger and better than ever. We have also made a tremendous improvement on silage, and further than that we have made berseem hay which I find to be one of the most valuable feeds of stock that we have in India. When I refer to growing hot weather maize as a rotation to berseem, I may say that maize is a very heavy fodder. We find that the berseem gives all that the animal wants. In the three years rotation you can put oats instead of the berseem. As a matter of fact, just before we left Pusa, I put in sugarcane and got a tremendous crop. So you can quite clearly see what you can do with a crop like berseem on irrigated land. You can rotate it with sugarcane if you work your land properly without any manure, and that is a very big thing to be able to do. A tremendous lot of irrigated land in India is probably not properly manured for the simple reason that I do not

think it is realised to what extent a crop in the rotation like berseem can provide manure as well as fodder for cattle. We have now in Delhi an area of some 40 acres under berseem. I was not at all certain when we put it down as to how it was going to do ; but to date, it has given us about double the amount of fodder for cattle that it gave us in Pusa, and I am now able practically to halve my area, although I have a much larger number of working bullocks and I intend to increase the herd.

If we look at the cultivator's problem in the same way as we looked at it in Pusa, you will see one thing. And it is that until you increase the value of these cattle in India, you are not going to get people stopping the growth of cash crops in order to provide fodder for cattle. The trouble is that when you get down to actual facts it comes to this. If an animal is worth about Rs. 15, it is a very hard job to expect a man to put his valuable land under fodder crops when that Rs. 15 worth animal is getting along perfectly well. Now, there are very few countries in the world which feed their cattle better than they do in India. The really good cattle are fed very well. You have only got to see some of the cart bullocks to find out how well they are fed and how well they are treated in spite of their value being so low. Unless, therefore, you get some value put into those scrub cattle either by lessening their number or else by adopting some such method by which it is made more expensive to keep them, (in that case their number will be lessened), you will not get this question of fodder taken up. The moment the cultivator finds that he is going to get a price for them, he will proceed to put his land under fodder cultivation. But until that is done, I do not see any chance of the movement making any headway. I went round to Meerut the other day. Lot of fodder is being grown there under tube wells, but as far as I could discover it was being sent from the villages to Meerut to be sold for the use of polo ponies. It is for that reason that I urge that unless you raise the value of your cattle, you are going to have a great deal of difficulty to put land under fodder, though it can be done, and it is a perfectly good farming proposition as I have already shown it.

Lt.-Col. E. W. C. Noel : The remarks of the last speaker in regard to berseem are particularly applicable to the North-West Frontier Province as we are supplying berseem to the rest of India. We are yearly getting increasing demands for seed. Berseem for fodder will yield 100,000 lbs. per acre, but if two cuttings are sacrificed, 400 lbs. of seed per acre will be obtainable, which is up to the Egyptian standard. The Royal Commission on Agriculture drew attention to the importance of the supply of seed. They wrote : " If the seed of this crop (berseem) can be cheaply grown in quantity, there is at least some ground for the hope that in tracts such as the Punjab and Sind, it may be added greatly to the fertility and wealth of the country ". We have been carrying out experiments of making berseem hay. It has been suggested to the Army that they should partially substitute this for Bhoosa. Samples of berseem hay and bhoosa were analysed and as a result a substitution of ratio of 20 to 12 has been suggested. As the Army are now buying bhoosa at 11|12 annas a maund we would be justified in asking a rupee a maund for the berseem hay. At that price it would be a profitable crop. The proposal is now under consideration to supply

1,000 tons of berseem hay next winter to a Cavalry Unit as an experiment. The question of the use of berseem hay for feeding cattle might be taken up in other parts of India. It would seem that the feeding value of berseem hay from an acre is considerably higher than in the case of any other crop. A new variety of berseem from Egypt is being tried this year which gives one single heavy cutting and is therefore useful in cases where the rotation demands the sowing of the next crop in the early spring.

Mr. P. B. Richards : This question of the introduction of more fodderous rotations is one which is receiving considerable attention of the United Provinces Government at the moment. We have to deal with the question from two points of view, namely, in connection with our cattle improvement scheme and in connection with the maintenance of fertility. So far as cattle are concerned, for the ordinary cultivator it is better that he should have some kind of fodder rather than none at all. It is no use our attempting to do anything great in the way of improvement of cattle in general throughout such a country as the United Provinces unless we pay proper attention to the feeding of the young stock in order to get the real intrinsic value. I am in entire agreement with Mr. Sayer and I can tell him that in actual practice in our special cattle breeding districts, where extensive work is going on, the cultivators themselves are readily taking to the introduction of berseem and are growing more fodder because they realise that they get their money back in the increased value of their cattle. Apart from that, with the proper use of the leguminous fodders, we undoubtedly have a very important weapon in soil improvement. We have a cattle breeding farm in Kosi and there we have recently taken to the growing of berseem followed by cotton and the cotton crop which it resulted has been so very much greater than has ever been grown in these areas before and it has paid for the cultivation of berseem quite apart from the value derived from the berseem itself. You can grow berseem with the cotton by sowing it in October. There is no other way, I feel certain, by which we can, without interference with the cash return of the cultivator, ensure a greatly augmented stock of nutritious fodder. Our guiding principle and I think it must be the guiding principle wherever such attempts are made is that this production of fodder must result at least in no loss to the cultivator for the rotation compared with what he has got in his cash improvement crops. His cash returns over a period of years must be at least as great and he must be able to grow his own food. We cannot hope for any thing, unless you can demonstrate to the cultivator, to get him to take it up and I think that is what is to be our main plank. You have to deal with this problem piecemeal to suit the irrigation and soil peculiarities of particular tracts. We may even have to deal separately with different parts of units so small as a village, but that does not create any great difficulty provided we have the staff for demonstration purposes. It is on this that the whole of the rapid advance desired must depend. You must be able to demonstrate on the cultivator's own fields that with the method you propose he is going to be better off in the long run. Now as to ways and means, there are a number of possibilities which may have been tried out in other provinces but which we have not yet fully exploited. The growing of berseem, with an early *kharif* crop preceding it, which you have heard of in Pusa, has been so highly successful, is one of the methods which we hope will take on in a good deal of our

area. The main difficulty about that is of course the necessity for considerable irrigation water. In the work which we are doing the Irrigation Department is co-operating with us and all our trials are being watched both from the point of view of the utilization of canal supplies and of the final result to the cultivator. So interested in fact is our Irrigation Department in the spread of leguminous fodders that it is considering concession rates even though the amount of water required is very high. I am inclined to think that in irrigated areas a great deal of reliance will have to be placed on double cropping in areas in which single cropping has usually been the practice,—double cropping particularly to take up in rice areas and an early *kharif* crop in order to be able to clear the land and get down to leguminous crops for the *rabi*. Similarly, with ground-nut, we can take early ground-nut crops which can be off the land in time for preparation for the *rabi*, in this case generally grain which will augment the *bhoosa*. There is a point which occurred to me when we were discussing the previous subject of grassland utilization—the information which was given to us of the possibilities of hay in some areas sounded very promising. The U. P. experiment which Mr. Smythies remarked upon has given an increased yield of about 12 maunds per acre at the outset. If the whole of our six million acres of waste land could be developed to produce an extra 10 or 12 maunds of hay, it would mean, for our very heavy cattle population, a matter of two maunds of additional fodder per bovine per annum. It seems to me that areas which can grow good crops of hay must be explored to see whether they cannot grow better crops of cultivating fodder. If land is good enough to grow good hay, it should be good enough to turn out a bigger average of fodder, either *kharif*, *jowar*, and gram mixed or with a *rabi* fodder crop where no irrigation water is available.

Khan Bahadur Muhammad Ayub Khan : We have heard from previous speakers about the quality of the berseem crop both as a fodder crop and a leguminous crop, but in the case of Sind, in addition to this crop, there are other crops like gram, *mutter* and other crops which are very popular with the cultivator. The fodder crops as well as the leguminous crops have done very well in our province. Usually the cultivator prefers to grow these crops in Sind for two reasons : firstly, on the right bank of river Indus, although there are barrage canals and it is mostly an irrigated area, but the area is usually cultivated with rice crop, and the rice crop is grown from year to year. Therefore, at the time when the *rabi* cultivation is grown, the cultivator in Sind grows gram and *mutter* crops in order to supply fertility to the soil and make it fit for continuous cultivation from year to year with a rice crop. Similarly on the left bank where mainly cotton is grown and about which the Director of Agriculture from Sind has already mentioned something, it has been found to be more desirable to grow berseem, or such crops. These leguminous crops go very well with cotton cultivation. Sir, the complaint in Sind is that the usual tendency now is for the owner of the soil to grow those crops which pay him most, and particularly crops like cotton and sugar-cane. It is quite natural that these crops are preferred by the owners of land, for one reason particularly that when the barrage canals were opened in 1932 and they have been irrigating the lands from year to year, most of the waste belonging to Government was sold out to the highest bidder, and those people who purchased these

lands and also those people who owned their lands and who enjoyed the barrage concessions would certainly prefer to grow such crops as would enable them to pay off the initial cost which they had to incur in buying these lands. So the question is really one of economics there and we cannot blame these people if they naturally concentrate their attention on growing crops like cotton or the sugar-cane. At the same time it is very difficult,—I feel as a practical point it would be very difficult—for the provincial legislature to introduce legislation restricting the cultivation of these crops because there will be a great uproar on that question and those people owning these lands will naturally demand that since Government have charged them the maximum price for these lands, they should be given a free hand to grow whatever crops they choose. So the only point will be, as has been pointed out, persuasion,—considerable persuasion not only by propaganda but by other methods also whereby people should be encouraged to grow fodder crops and leguminous crops. Sir, in 1932 when the barrage began to function, Government had taken up the revision of settlements, and in those settlements the Government made a great mistake, if I may say so, in enhancing the land assessment by one hundred per cent.; in the case of crops like gram and *mutter* the assessment was at once increased by one hundred per cent. on these fodder crops and that has proved as a very great deterrent to people to grow these crops and experience during the last five years ever since the barrage has functioned in Sind shows that from year to year the cultivation of these leguminous crops is going down and, as you will find from the figures, the cultivation of fodder crops has considerably gone down in Sind. It has, become, therefore, a serious problem—which was also considered at the Provincial Board of Agriculture as well and the Lloyd Barrage Committee—and it was considered that special measures should be adopted by the Provincial Government to see that these fodder crops and leguminous crops should be encouraged and the people should take these crops systematically and which they should grow every year. I am emphatically of this opinion that one of the main considerations for these people taking up these crops will be that the assessment should not be so high that people should feel it difficult to grow them. At present the tenure of lands is this, that the Zamindar is the owner of the soil and pays the land assessment direct to the Government. The cultivator shares fifty per cent. of the produce with him in kind. Now the Zamindar will naturally feel that when he is responsible to pay the entire Government land assessment and when the crop which is grown mainly for the purpose of maintaining cattle is made for the benefit of his cultivator and since it is very difficult for him to realize any fresh amount for the crop although he will be compelled to pay the assessment to the Government, it would therefore be perfectly in the fitness of things if the assessment is considerably lowered down in order to make it possible for the owner of the soil to pay assessment to Government. Sir, the difficulty really comes in there that the Zamindar has to say whether he will make two ends meet, whether he will be able to get enough out of his land to pay his assessment to the Government, and one tendency that I find now is for owners of land during the last five years to concentrate more and more on money crops. And, Sir, the reason why these crops were preferred by the cultivator are that these crops like *mutter* or gram do not require any irrigation. You can even do without water supply in the rabi season, whereas for berseem irrigation is necessary and at the

same time the preparation of the soil takes a considerable time and it involves considerable labour. I therefore think that while drafting this resolution this point should also be taken into consideration, which is also in consonance with the special conditions obtaining in the Province of Sind.

Mr. W. J. Jenkins : Sir, I do not intend to go into the provincial details of this problem but I should like just to refer to one or two broad items that are for consideration and to make one or two suggestions. Firstly, Sir Bryce Burt has suggested that the Agricultural Department should definitely pay attention to securing the diversion to fodder production of a part of the area released by the introduction of heavier yielding and more profitable crops. Unfortunately we have been given no idea as to how this admittedly desirable result is to be achieved and personally my own experience has been, particularly in Sind, that the introduction of crops affording a better return to the cultivator generally tends to increase the area under that crop and so make it much more difficult to get any restriction on area adopted. On the other hand, the Agricultural Departments have, for many years, been urging upon the cultivators to extend the cultivation of leguminous fodder crops in the interest of improved rotations. If our efforts in this direction have not been successful when the object was to increase the value of these cash crops, I think it is going to be increasingly difficult when the object is to improve the cattle in which, up till now, cultivators took very little interest. The Indian cultivator is of the same opinion as Dr. Voelckes that the growing of green fodder crops is of little importance whatever in the *maintenance* of cattle. And I think the truth of that is borne out by the fact admitted by Mr. Ware that only half a pound per day is available per head to the cattle of India in the way of green fodder. The question is different when we come to the *improvement* of cattle and the fact that this subject is being discussed here is evidence of the increasing interest taken in cattle improvement. I should like to suggest that there are two methods by which this can be done. Firstly, I think there is a great possibility of increasing the cultivation of mixed crops, one of which is a leguminous crop or fodder crop of some kind. That obviates the difficulty of the cultivator having to reduce the area under his cash crops to which he is so much attached, and at the same time it will have the desirable result of improving the outturn of the cash crop if a leguminous crop is included in the mixture. Most agricultural officers in the provinces will be able to state instances where this has already taken place.

My second suggestion arises out of the proposals made earlier in the meeting about the development of waste lands, firstly through grazing, then through the grass cutting stage, and finally I think it would be possible in many areas to develop to the third stage, that of fodder cultivation. It should be a perfectly easy thing for local Governments to give out the best of these lands to cultivators on conditions which include the cultivation of fodder, as part of the tenure conditions of the land, or on the other hand, to give them out at concession rates on condition that leguminous fodder crops, or a certain percentage of them, were included in the cultivation. Unless some such inducements are made or, unless compulsions are enforced, I do not think we can compete with the rainfall and the prices of agricultural produce in dictating what the cultivator should grow.

In regard to berseem I have nothing to say except to mention the difficulty experienced in Sind that berseem requires double the irrigation water than the *rabi* cash crops which it is intended to replace. That made it a very great problem for cultivators to take up berseem cultivation on any large scale.

Mr. D. R. Sethi : Mr. Jenkins has brought out the point that I wish to bring out in connection with the cultivation of berseem. The department of Agriculture in Bihar has been doing everything possible in the way of investigating the possibilities of growing fodder crops. We have grown berseem very successfully not only on the Chota Nagpur plateau but throughout the plains. The difficulty of getting berseem introduced into the cropping scheme of the countryside is irrigation. More than 2/3rds of our province is rain-fed ; the remainder is mostly under paddy. Whatever land is available for berseem will require in most cases lift irrigation. Mr. Sayer told you that he irrigated his berseem at Pusa up to centrifugals but he did not tell us exactly what the cost was. My experience is that berseem requires for every irrigation not less than 80,000 gallons of water. If this amount is pumped either from tube wells or from any other source by means of centrifugal pumps, driven by oil engines, the cost would be in the neighbourhood of Rs. 2-12-0 to Rs. 3 per acre per irrigation. This crop requires about 8 irrigations in the season and as such its cost would be about Rs. 24 for irrigation alone which is much more than what it costs to irrigate sugarcane. It is, therefore, difficult to see how the cultivator can be induced to grow berseem when he has to spend this large amount on irrigation alone. The cultivator understands the rotation of crops fairly thoroughly. Little mention has been made about rice which is grown on a very large area not only in Bihar but in the neighbouring provinces of Bengal, Orissa and the Central Provinces. I am now talking from personal experience of Bihar and parts of Orissa. It is well known that the cultivator practises what may be called a rotation on his rice lands. Before paddy is harvested he broadcasts in the standing crop a leguminous fodder crop which in most cases is ' khesari ' and he utilises this mainly as fodder for his cattle. I have had now over 23 years' experience in those parts of the country and I cannot think of any more suitable crop which with the least amount of expenditure will give to the cultivator as big a return in fodder cultivation as khesari does.

Coming to the question of improved varieties of crops, all of us who have been engaged in that work fully realise that to get the full benefits from improved varieties they must be accompanied by better cultivation and better manuring. Without these they are perhaps a bigger curse to the cultivator than his own old crops were. They impoverish the land and you draw on your banking account with the result that very soon there will be nothing left. The problem of making land surplus is therefore a problem of rupees, annas and pies. The cultivator has not got the means at present to put in all the manure and cultivation necessary to get the full benefit through the improved varieties that we are able to put out. And until and unless ways and means are found which will enable him to get more from his one acre than he is getting at present, to expect him to set apart any of that land for fodder cultivation is, I think, quite impracticable.

Chaudhri Hans Raj Saini : Sir, the importance of cultivating fodder crops purely for the purpose of feeding animals has been realised by the Punjab zamindars for a long time. Figures show that out of the total area of 9 million acres under fodder crops in the whole of India, nearly 50 per cent. is in the Punjab, and the area under fodder crops forms 15 per cent. of the total cropped area in this province. It has been suggested that by the cultivation of improved varieties of cash crops certain areas can be made surplus and can be utilised for fodder crops. This can be considered in another way, that is, by the improvement of cultivated fodder crops which are already under cultivation and by producing better yielding crops the same area can be made to yield more fodder. Bearing this in mind, intensive work on the improvement of fodder crops was started in the Punjab about a decade ago, and during this period a large number of leguminous as well-as non-leguminous crops giving better yields than those already under cultivation have been produced. We are in the fortunate position at present of recommending to the zamindars of the Punjab much better varieties of crops, *i.e.*, not only crops giving better yields but crops which can be utilised for special purposes, those which can supply green fodder during transitional periods of the year. In order to solve these problems various crops were tried in the Punjab and some of them have been found successful and give heavy yields of green fodder. Then, selections made from the indigenous crops have also given very good results and they are being taken up for cultivation and gaining in popularity day by day.

Colonel Noel mentioned that there is a large demand for the seed of berseem from his own province. Most of the demand comes from the Punjab because the zamindars do not keep seeds for their own purposes for sowing next year. The chief difficulty about berseem is that the zamindars in the Punjab are tempted to feed it green. The chief utility of berseem lies in the fact that it supplies green fodder during early summer months when there is a scarcity. A large part of the seed has to be brought from outside. At first it was thought that berseem does not set seed in the Punjab but later on it proved to be a good seeder and after two cuttings of green fodder about 5 maunds of seed can be obtained. In most parts of the province and for the irrigated areas we have been able to work out schemes for a supply of green fodder throughout the year and animals can be fed upon it. Further, for the barani areas where the rainfall is something like 25 inches a scheme has also been worked out and it has actually been tried at the Rawalpindi agricultural farm where we cultivate elephant grass zorghums, rapes and oats, etc., thus getting a sort of continuity over a greater part of the year. Where the rainfall is below 25 inches we have bajra, jawar, etc., and varieties of these crops are being given out to zamindars. Therefore the question for the Punjab zamindar is the introduction of better yielding varieties, that is, varieties which while giving greater yield will give more fodder to the zamindar.

Chairman : I think we have had enough discussion on this and we shall go on now to the next item.

ITEM 3.

Mr. F. Ware : I think I should commence my introduction to this item on the agenda by referring to the absence of Sir Arthur Olver which

I am sure we all deplore. As you all know, for the last 7 years he has been doing his utmost and working extremely hard for the improvement of India's livestock industries and I am sure that he himself would very much like to be with us today at this conference which in some ways is the culmination of his efforts. And when I say I wish he had been here with us, I think I should remind you what he had particularly in view in regard to this matter of developing India's livestock industries. He has, I think, already in his numerous articles and notes expressed the opinion that what is required in this country more than anything else is a self-contained organization for animal industry. He has also stipulated that this organization should be headed by a livestock expert of some kind and that he should also have a separate budget under his control, and I would ask members of the conference to try and bear that in mind as we proceed with our discussions. I am not going to attempt to show how that can be fitted into the general scheme of things in the different provinces, but I hope perhaps some of those who will follow me will be able to make acceptable suggestions. What I am going to do is to say a few words about this organization and what it should contain in the way of staff. I think it will simplify matters if I describe it under three heads,—I would describe them as the head and tail and middlepiece. With regard to the head of this organization, as I have already said and as Sir Arthur Olver has pointed out, there should be an officer who is an expert in livestock matters in charge. It is possible that he himself will be an expert in only one branch of the animal industry, and therefore he will require assistance in the other branches. Those branches are,—first of all I would put disease control which, although we have made a considerable amount of advance, is still the most important item in livestock improvement in India ; secondly I would put nutrition. At the present time most of our animal nutrition workers are concentrated in research institutes and laboratories, but I look forward to the time when we shall have nutrition officers at work in the field. I dare say some of you have seen a recent proposal in regard to human nutrition that each Director of Public Health in the province should have an officer to help him to devote his attention and time to the nutrition side, and I think we should have something of that kind in our animal industry department in due course. If the officer in charge of this organization is not an expert in nutrition matters, he would require some one to help him. And lastly he will require an expert in dairying if that side of the subject is going to be developed.

I will now pass on to the tail of this organization. What I mean by that is that we must have a lowly paid agency to do simple items of work connected with livestock improvement if we are going to get our results across to the villages. H. E. the Viceroy referred to that himself in his speech yesterday, and it is a point that has often been emphasised on many occasions recently both in connection with livestock improvement and public health work. In order to meet this demand at our meeting of the Animal Husbandry Wing held at Madras in December last, we recommended that a cadre of stockmen should be recruited and attached to the department concerned for work under supervision in the villages. In the note on this subject will be found the items of work which these men will have to perform after a short term of training. I won't go into the details of that question now. Those two parts

of the organization, I think, I have already dealt with, and we now come to what is really the most important in some ways, and that is to fit in the middle piece we must have as large a body as possible of well trained men doing what I prefer to call spreading the gospel of livestock improvement work throughout India, doing propaganda work acting as our field agents directed from the centre. Details of work that these men will have to do will be inspections of all kinds, inspection of animals, inspection of registers, inspection of the work of societies dealing with livestock improvement and so on, and these men are also required to supervise the work of the proposed stockmen.

Now, Sir, the point arises as to how we are going to obtain this large body of men, and I would remind members of the conference that yesterday some of them raised the question of finance. It was stated, I think, by some provinces that unless the Government of India came forward with financial help it would not be possible to do much in the way of improvement. I mention this now to show how in my opinion it is necessary to make as much use as possible of suitable existing staff. It is only natural, therefore, that I should refer to the question of making use of the executive veterinary staff where it is not used at present. These men by reason of their training and constant association with animals, I think we must admit, are suitable either with limited training or without training for what is called livestock improvement work. I am going to give you a few figures to show what is being done at present, and what we have available in the existing staffs. If we take Madras first, I understand that the number of people in the Agricultural Department employed on livestock improvement work is not more than 12 ; on the other hand, Madras has a total of 297 in their Veterinary Department none of whom are used on livestock work. In Bombay the Agricultural Department has 21 on their staff who are doing real livestock improvement work. In that province there are 152 in the Veterinary Department and a number of them could be employed on livestock improvement work. Then coming to Bengal, Bengal has 6 men who are doing livestock improvement work, whereas use might be made of a majority of the 158 veterinary men. I need not refer to this point any more, because they are all the same until we come to the Punjab. In the Punjab 11 of the Agricultural Department are doing livestock improvement work, but their staffs are augmented by 441 veterinary men most of whom are employed on livestock improvement work. Now, I submit that all these figures are very illuminating, and I hope that they will convince all of us that it is necessary to make more use of all these men who are available. One of the objections to making use of the executive staff of the veterinary department in some provinces has been that some of these men are employed under District Boards and are not controlled in the ordinary way by the Director of the Department. I think now is the time for us to take up that question in all seriousness. As long ago as 1927 the Royal Commission on Agriculture recommended that in provinces where they were not provincialised, the duties of these people should be defined in such a way that ordinary dispensary work should be a charge on local funds, but that contagious diseases work should be done by the provincial staff. That is essential if we are going to have complete control over contagious disease so that for that purpose alone it is necessary for Provincial Governments to take up this

matter. And I suggest, Sir, that this is a favourable opportunity to take it up with a view to using these men not only for disease control but also to help us in this subject of livestock improvement which we all have so much at heart.

Chairman : I think it will probably suit the convenience of the members of the conference if we adjourn now and meet again at a quarter past two.

The Conference then adjourned for lunch till 2-15 P.M.

The Conference re-assembled after Lunch at 2-15 P.M. The Hon'ble Kunwar Sir Jagdish Prasad was in the Chair.

Chairman : I should like if possible to finish the discussion on this subject by about a quarter past three so that we can take up the draft resolutions which have been circulated to members.

Dr. W. Burns : In following Mr. Ware on this subject I am reminded of the notice, " Electric Power Station. 10,000 volts. High Tension. Keep off ". But since the matter has come up many times and we know its various aspects, I do not think that there is any likelihood of my saying anything that is necessarily inflammable. At the same time, it is a matter of fact that there has been some heat in previous discussions on this matter. I myself have probably contributed to it since as Director of Agriculture my feelings on the subject were considerably warm, but the matter has been before us for so long and in so many different aspects that I think we ought to be able to consider it in a more or less objective manner.

Sir Arthur Olver has for many years pursued with the utmost tenacity a particular line of progress with a particular aim in view which has been set out before you by my colleague, Mr. Ware, this morning. In the course of the various arguments that have been from time to time put forward with regard to that aim and the means of obtaining it, there have always been two very strong or supposedly strong arguments one being what was done in the Punjab and the other being what was done in other countries. In the course of a little study of the subject I had occasion to collect a certain amount of information from other countries and if you will have a little patience I will just quote four different things that I have come across, two from the United States, one from Canada and one from South Africa. The United States Department of Agriculture has issued a booklet of their own on the United States Department of Agriculture, Its Structure and Functions (that is the Federal Department, of course). We find that it is split up into departments—Bureau of Agricultural Economics, Bureau of Agricultural Engineering, Bureau of Animal Industry, Bureau of Biological Survey, Bureau of Chemistry and Soils, Bureau of Dairy Industry, Bureau of Entomology, Bureau of Plant Industry, etc. If we look up the Bureau of Animal Industry, we find the principal lines of work are distributed to the animal husbandry division, animal nutrition division, biochemic division, experiment station, field inspection division, division of hog-cholera control,

meat inspection division, packers and stockyards division, pathological division, tick eradication division, tuberculosis division, division of virus-serum control, and zoological division. If we come to plant industry, it is not put up in such a tabular form, but we find :

" Widely varied research is conducted in the fields of agronomy, horticulture, physiology, biochemistry, genetics, and technology with special reference to cereal and forage crops ; to drug, sugar, rubber and fiber plants ; to cotton and tobacco ; and to fruits, vegetables, nuts other economic crop plants ".

Then it also includes cotton improvement by various experiments, etc. In the letter that was sent with the booklet it was stated :

" As to the research activities in which you have expressed particular interest, the breeding investigation with beef and dual purpose cattle are a responsibility of the Animal Husbandry Division. This Division also co-operates with the newly created Animal Nutrition Division in beef and dual purpose cattle nutrition investigations by conducting the practical feeding trials with these classes of livestock. The Animal Nutrition Division places most emphasis on research in fundamental problems of feeding and nutrition, especially those phases involving elaborate laboratory technic.

The research in the problems of breeding and nutrition of dairy cattle is the function of the Bureau of Dairy Industry of this Department and your letter is being referred to that Bureau for such information thereon as they may be in position to send you."

Leaving the Federal Department of Agriculture and turning to agricultural organisation in individual states I am informed by correspondence that " the chief function of the Agricultural Experiment Stations in the United States is to provide for research in agricultural subjects as well as to disseminate the knowledge pertaining to agricultural improvements to the general public. In other words, the functions of these Experiment Stations are similar to the Agricultural Departments in this country (that is, India), although as a matter of convenience most of these stations are located at the University centres and form a part of the agricultural colleges ". In that connection, one of the best known of these agricultural experimental stations is the one at Iowa, and I find a list of sections and subsections as follows :—Agricultural engineering section, Agronomy section, Animal Husbandry Section which has the following sub-sections : Sub-section for animal breeding, sub-section for animal chemistry and nutrition, sub-section for animal production, sub-section for dairy husbandry, sub-section for meats, sub-section for poultry husbandry. There are other sections also. The forwarding letter says :

" The veterinary research is carried on in the veterinary school as a separate department, comparable to such departments as surgery, veterinary medicine, etc. You will understand, therefore, that veterinary research is not in the Agricultural Experiment Station ".

In the case of Canada, again, dealing with the Federal Department of Agriculture there, it includes the following branches. They do not

call them bureaus but call them branches. Those branches are, Experimental Farms Branch, Dairy and Cold Storage Branch, Health of Animals Branch, Live Stock Branch, Seed Branch, Entomological Branch, Fruit Branch, Agricultural Economics Branch, Publicity and Extension Branch and Library. In the forwarding letter they say that all officials in the Health of Animals Branch are veterinary officers, and in the Live Stock Branch and Animal Husbandry Division of the Experimental Farms Branch the officials are agriculturists. (In the case of South Africa the department is sectionalised into eight divisions. The words division, brands, etc., vary from place to place but they mean the same thing.) There are :

A. The Secretariat.

B. Division of Veterinary Services.

C. Division of Chemical Services.

D. Division of Forestry.

E. Division of Plant Industry.

F. Division of Agricultural Education and Extension.

G. Division of Economics and Markets.

H. Division of Dairying.

In further elucidation of this, the forwarding letter states :

" I have to inform you that Dairying is entrusted to one Division under the control of the Superintendent of Dairying, whereas Animal Husbandry is entrusted to three separate Divisions, *viz.*, Plant Industry in so far as pasture questions are concerned, Veterinary Services in so far as fundamental questions are concerned, and the Division of Agricultural Education and Extension in respect of breeding and production ".

There you have a whole set of varied types of organisation and the thing in which they most remarkably resemble one another is this, that you have got these various activities entrusted to one very strong and powerful department. One of the real difficulties in discussing this question for us in the last four years has been that the whole tone and trend of the discussion has been separatism. In other words, there has been an insistence on a separate budget, on a separate personnel, and a separate appeal to the cultivator. I can quite understand that line being taken. At the same time, it has undoubtedly been one which has aroused a certain amount of I think quite understandable feeling in connection with the possibility, as it appeared, of an important branch of agricultural activity being split off from the agricultural department and added to the veterinary department. I put the matter very crudely, but that is how it has appeared. I have discussed this matter with my colleague, Mr. Ware, and we have attempted to consider this objectively and sanely and I think that we are agreed that the real solution for this type of difficulty, which will be chronic unless we attempt to get some kind of a reasoned solution, is not separatism but unification. In other words, that the real solution is a powerful unified department of agriculture in which there will be only

a single appeal to Government for funds and there will be a unified appeal in the form of propaganda to the cultivator. I trust that I am expressing correctly what I understand was the outcome of our private talks. Now, in a case like this it is necessary to deal with the peasant's crops, with the peasant's cattle and with the peasant's economics, and I do not see how you can have a powerful department unless you have at least three divisions which will deal with these three aspects. For that reason it seems to me that not only is it necessary to have your crops and cattle dealt with thoroughly by the divisions that are concerned with them, but you must bring in co-operation as well. We have in the past in most provinces had a comparatively weak appeal from three separate and to some extent competing departments with regard to our various propaganda and any kind of unification that will bring in the crops, cattle and economics together seems to be one that will very greatly strengthen the appeal of our work which is being done in connection with the peasant. I think we ought to regard ourselves as people of the first importance. It is easy to say in public speeches that 70 per cent. of the population of India depend on agriculture, but we will not get that attention paid to it until we have a unified department that is sufficiently powerful to represent that 70 per cent. in the way that it should be represented both upwards and downwards in all these activities. That is why I feel that this is the best solution of the matter. I do not suggest that this matter should be rushed. It is not a case for drastic, violent reorganization. There are individual and departmental rights and sensibilities that have to be considered, but at the same time it seems to me that unless we do face up to the problem and get some kind of solution of this type, some kind of guidance, we stay where we are. Therefore, gentlemen, I feel that a way out in these terms is the best escape from what has always promised to be an impasse otherwise.

The Hon'ble Rao Bahadur Chaudhuri Sir Chhotu Ram : I am very glad to note from one of the papers that have been supplied to us that the Government of India contemplates having a central institute for imparting higher training to those who would be employed in what is known as the superior service in this line.

We have suffered a good deal for want of such training. It is very difficult in the first instance to secure admissions in England. Moreover it is more expensive to send our young men there for training. Therefore, I welcome the proposal of the Government of India for having a central institute for imparting such training locally and I wish to add that this proposal should take material shape at a very early date.

After that I have to offer a few remarks with regard to the increase of the technical personnel. Here again the limiting factor is finance. The Punjab is an agricultural province and I have spent the greater part of my life in the advocacy of all those activities which will bring added income to the agricultural classes. I may be allowed to draw your attention to the fact that the province of the Punjab has been spending a good deal on livestock. As I told you yesterday, we are maintaining a farm of over 40,000 acres at Hissar which costs us something in the neighbourhood of 3 lakhs a year. Besides, we have half a dozen private farms held by private grantees. The total area of these farms is 28,000 acres and the capitalised value of this area is easily in the neighbourhood of 2 crores and on a return of 4 per cent. per annum, I think the

Punjab may be regarded as spending 8 lakhs a year in connection with these farms. Apart from this item we are spending over 20 lakhs a year on the Veterinary Department and of course a good deal more is being spent on the Agricultural Department which also has a good deal to do with the livestock industry. Our total budget for the year on agriculture is, I think, 32 lakhs, so taking the two departments together, that of agriculture and of veterinary, we are spending 52 lakhs a year, apart from the capitalised value of these farms. Therefore the Punjab may find it very difficult to add to its present commitments to any very large extent. We do our best to have some suitable increase made to our existing staff but as my friend, the Nawab Bahadur of Dacca, said yesterday, perhaps it will be reasonable for us to make a demand for subsidies from the Central Government for the livestock industry. After all the Central Government is subsidizing so many industries both directly and indirectly. The Tariff Board recommendations cost the Central Government a good deal and I may be allowed to suggest that the Central Government has done far less to promote the industries which go to benefit the agricultural classes. When so much is being done for the benefit of the industrial classes, there is no reason why the Central Government should not be able to make substantial grants for the promotion of an industry which goes to benefit mainly the agricultural classes. It is impossible to exaggerate the importance of the livestock industry. India as a whole is mainly an agricultural country and in the words of His Excellency the Viceroy the whole burden of agriculture rests upon the patient cow and the bullock and the livestock industry is naturally very much connected with the cow and the bullock. Therefore it is up to the Provincial Governments as also the Central Govment to spend as large sums of money as they possibly could. I have already said that the commitments of the Punjab in this respect are fairly heavy. I may also be allowed to draw the attention of the Conference to the fact that local bodies and district boards are not in a position to add a single penny to their present expenditure. They have imposed all the taxation which they could under the law as it stands. They have raised the local rate cess on agricultural land to the maximum they could under the law. They have imposed professional taxes and there are no other taxes which district boards can impose on the population which resides within the limits of their jurisdiction. Therefore they have really exhausted all their resources and the whole of their annual income is committed to the full to the last pie on the maintenance of existing services. Therefore this delusion should be removed once for all. Therefore it is up to the provincial Governments and the Central Government to add fresh amounts to the monies that are being spent on the livestock industry. While we are not in a position to have highly trained staff drawing very large salaries, it is absolutely essential if we want to promote the interests of the livestock industry to have the staff to perform the duties which have been enumerated in the excellent note which was supplied to us on the subject. I have summed up the general position so far as the Punjab is concerned. Any sub-heads of the proposal and any minor items will be dealt with by the Director of Veterinary Service, if necessary.

Chairman : I think it will probably help the discussion of this subject if members will turn to the draft resolution on Subject No. 3, which

has been circulated. I should like members of the Conference who do not find themselves in agreement with the draft to let the conference have their views.

Mr. P. B. Richards : The opening sentence of Resolution No. 1 on Subject No. 3 states very definitely that there is a need in every province for a livestock department or division with a separate budget for livestock improvement work and controller by a livestock expert whose whole time is devoted to that subject.

Now, Sir, much has been said in recent years about the work which has been done in the Punjab. Very little has been said, although much has been done, about the work in the United Provinces. I would not attempt to develop the resasons at the moment. Our organisation in the United Provinces has been for the last 16 years somewhat different from that in the Punjab. Up to that time the work was conducted by a Veterinary Department. The Local Government then decided to appoint a livestock expert to deal with our cattle problem. Such a one was appointed and for a number of years his sole duties were the organisation of our cattle breeding farms, the improvement of our local breeds or the acclimatization and development for local conditions of breeds not peculiar to the province and the distribution and supervision of stud bulls. The United Provinces is a very big area and the staff which could be placed at his disposal was small. For reasons which I shall explain presently, it was decided that it was much more desirable that the cattle breeding in special intensive areas should remain, as also the farms under our cattle breeding expert but that the development work in most of the provinces should be carried out by the agricultural staff as such. It was also considered, and I think very rightly that an area like the United Provinces, where there are few professional cattle breeders and where our ryot with his few acres of land is the cattle breeder, it was absolutely essential that our cattle expert should be in close touch with agricultural conditions, so that he should not go astray. Consequently instead of being put as a whole time officer doing nothing but cattle breeding, he controls our cattle improvement policy, obtains stock for issue and also in charge of agriculture. Up to a certain point it is a very effective organisation. I say, up to a certain point, because our agricultural staff in the districts has a lot of other important work to do and it is physically impossible even with the whole of the available staff to be able to give so much attention to the animal improvement work as he would wish. That however is not an intrinsic defect in the system. That is a defect in the number of staff which we have available in the United Provinces for agricultural work in general. Now, I think we may say we are fully satisfied that our scheme in the United Provinces is a sound one and I feel very diffident in accepting the statement which is included in the first sentence. In this connection I would like to draw your attention to the fact that in the report of the Royal Commission on Agriculture para. 208 it is said that the control of livestock improvement should be entrusted to the Agricultural Department. In paragraph 191 it specially commended the adoption in other provinces of the policy pursued in the United Provinces. I would draw the attention of this Conference to those points lest it should think that the Royal Commission had made recommendations, as it might quite well have made recommendations, which could not be accepted.

Mr. S. Lal : There is one point on which I would like to have information. What is meant by the words " separate Budget " ? If it is contemplated that we should have a separate Department as a livestock department in addition to the Agricultural and Veterinary Departments, I think that for the smaller provinces that would be an impossibility. We have considered the question and we do not propose to have a separate Department. We would like to place the money available for livestock improvement at the disposal of one of the two Departments. It would be impossible to create a separate department for livestock.

Sir Bryce Burt : By " separate Department " is meant separate funds—not a separate department as such. What all of us felt was that there have been too many transfers. We do feel that the officer responsible for livestock improvement, that is to say, breeding, dairying and such-like should be assured of a regular budget, a separate allotment of funds—not a separate department.

Mr. W. J. Jenkins : Sir, with regard to resolution No. 1, I may state that the conditions required here already exist in the Bombay Presidency and therefore it does not appear necessary for this Conference to draw the attention of all provinces to the need for such an organization. The reorganization of the Animal Husbandry Department in the Bombay Presidency is at present under the consideration of the Bombay Government and I am not in a position to give any remarks as to the policy which will be decided upon. From my personal point of view, I agree with the suggestions thrown out by Dr. Burns because I think, after listening to H. E. the Viceroy's speech, that there can be only one opinion in our minds and that is the need for concerted action by everybody concerned in livestock improvement work. I would just like to dwell for a minute on a point raised by Mr. Ware's speech which I think is liable to give rise to a misconception. He stated, for instance, that in Bombay there were only 21 men of the Agricultural Department engaged on livestock improvement work. That is definitely not correct. Out of the 260 people in the Department about half are dealing with livestock work in the districts in addition to their agricultural duties and I think that point should be nailed down for ever,—it is not only the staff of the Livestock Section of Agricultural Department who are doing livestock improvement work but a much greater proportion of the staff of the Agricultural Departments. The only other point I wish to mention is the question raised in the second part of resolution No. 1 and I think I have the agreement of the Honourable the Minister for Agriculture, Bombay, that a policy which would embrace these kindred subjects under one Minister would be acceptable. In conclusion, I would only like to state that I personally welcome the recommendations of the Animal Husbandry Wing regarding formation of a cadre of " stockmen " for livestock improvement work in villages and specially recommend it because it indicates a realization of the necessity of choosing these people from the right classes,—that is, from people with agricultural experience and training. Personally, I would welcome very much a solution on the lines indicated by Dr. Burns.

Chairman : As far as I can see, the only dissentient is Mr. Richards in regard to the draft resolution on this subject. Am I correct in this statement ? Will Mr. Richards kindly suggest any amendment he likes ?

Mr. P. B. Richards : I should leave out the words " livestock department or division ". If one could know of the definition of a " division ", one might be able to suggest a suitable amendment. There is a further difficulty about this. With regard to the point that the whole time of an officer should be devoted to this subject, that is a point upon which I feel very strongly that the livestock expert must be in close touch with agriculture : and if he has only one district to look after, as long as he is doing his duties with a knowledge of what the real cultivator wants, that is all right.

Chairman : I have heard nothing so far about the third part of this Resolution.

The Hon'ble Raja Maheshwar Dyal Seth : I think that the idea was that these resolutions should be passed as the result of the discussions which we have held yesterday and to-day but I find that this matter was never actually discussed.

Chairman : In order to concentrate the discussion we have put it in the form of this draft resolution. The matter is still under discussion and in order to crystallise the discussions we have put it in the form of draft resolutions.

The Hon'ble Raja Maheshwar Dyal Seth : This is a matter of great importance. Our course of action may be contrary to what Dr. Burns has recommended and what is mentioned in resolution no. 1. As a matter of fact, in the United Provinces we have not provincialized our veterinary staff but if and when the department is reorganized I should personally not be surprised to find that they actually decided upon a policy contrary to that laid down in resolution no. 3 and I should think that the lines advocated by Dr. Burns just now will give us a suitable organization to deal with these matters in a more suitable way than what is contemplated heretby resolution no. 3.

Mr. V. R. Phadke : With regard to item no. 3, Mr. Ware has already given you a synopsis of the note published by the Imperial Council of Agricultural Research under different heads, and also some figures for the provinces. I am sorry to say that owing to financial stringency in matters particularly veterinary, no progress has been possible in India on the lines recommended by the Royal Commission on Agriculture particularly I may say so of my province. There was a time when the Reorganization Committee that was appointed in Bombay recommended that the veterinary and agricultural college should be abolished. But fortunately that recommendation was not accepted.

There are only 131 veterinary assistant surgeons, 3 inspectors, one deputy director, and one director, and the money spent is approximately 3.65 to 3.85 lakhs. In recent years the work of the Department, I may say, has considerably increased in adopting improved preventive measures in combating contagious diseases, chiefly rinderpest, by goat virus inoculation. For the most part of the month the veterinary assistant surgeon is on tour on outbreak duty, and it is deplorable that the work of the dispensary has got to be left to the compounders. However, many of the graduates are ungrudingly taking part in village uplift schemes in many centres of the province. So I am afraid veterinary assistant surgeons in my province could not be spared for livestock work, unless assisted by

stock-men under the scheme. But owing to financial stringency and as a matter of despair, I take it and as something has got to be done in the way of supplying some kind of low-paid agency for village improvement work, we shall have to utilise the services of these stock-men after being suitably trained in veterinary hospitals, dairies and agricultural schools for a period of 6 to 9 months. These men will have to work under the supervision of the technical staff. It is recommended that these men should be recruited from amongst the ryots knowing the vernacular. I do not think English-knowing boys would be available. What duties they would be called upon to perform have been enumerated in the note. Lastly, I may say that when the curriculum of the provincial veterinary colleges in India would be revised on the lines recommended by the I. C. A. R. a veterinary graduate of the future would be an important asset in undertaking work in connection with the livestock improvement in this country.

Sir Bryce Burt : There is a slight misunderstanding. Resolution no. 3 is in every way supplementary to resolution no. 1 and this is in complete accord with what Mr. Ware and Dr. Burns have put forward. I would like to say one word about the extreme importance of an adequate disease-controlling staff and of the veterinary director having effective control of that staff. Only this week I find that India at present cannot ratify three important international Conventions dealing with animal diseases because we cannot give the required guarantees and we shall not be able to ratify these conventions and give these guarantees until the veterinary directors have effective control of a certain portion at any rate of their staff of veterinary services. Now, Sir, I put it very bluntly because it is a most important matter. What has been put forward here is in no way contradictory to what Dr. Burns and Mr. Ware have said. But I quite see that Hon'ble members hesitate to commit themselves on a matter of policy such as this without mature consideration. I would therefore ask your permission to make a small change in the drafting. With my amendments the resolution will read thus :

> "*It is also suggested for the consideration of provinces* that the best possible use should be made of existing staff and, in particular, that in those provinces which have not completely provincialised their veterinary staffs there should be a clear division of responsibility for veterinary work. Local bodies *might* be responsible for the maintenance of veterinary hospitals, for the treatment of ordinary diseases and casualties and should retain control of the veterinary assistant surgeons required for that purpose. The rest of the veterinary assistant surgeons *would* form a disease control staff at the disposal of the Directors of Veterinary Services and those assistants could render substantial assistance in livestock improvement work."

I hope the resolution will be acceptable to the Conference in this permissive form.

The Hon'ble Sir S. T. Kambli : I would like to know whether it is intended by this resolution that the local bodies would be responsible for the payment of veterinary assistant surgeons.

Chairman : I think these are matters of detail which we must leave to the local bodies to settle in consultation with the local Governments. I do not think this Conference should go into these minute details at all. As the resolution is now drafted, it leaves it open entirely for the provinces to make such alterations as they may consider feasible.

The Hon'ble Raja Maheshwar Dyal Seth : We, in the United Provinces, do not agree with the suggestion contained in the resolution. We want to take back the control of the entire veterinary staff and place it entirely under the control of the Director.

Chairman : I shall congratulate you most heartily if you will accomplish that change of policy in the United Provinces of which I have had a great deal of experience.

May I take it that there is general agreement to the resolution as now amended ?

The resolution was adopted.

Chairman : Now, I shall turn to the three resolutions which deal with the first three subjects which the Conference has been discussing yesterday and this morning.

After some discussion the first part of resolution no. 1 was adopted in the following amended form :

> " The Conference having noted the response to His Excellency the Viceroy's Appeal for the provision of funds for the purchase and maintenance of *approved* breeding bulls, being convinced of the necessity for a sustained effort to improve Indian cattle and of the importance of continuity of policy in all livestock breeding considers it desirable :—
>
> (1) That there should be established in each of the provinces and States represented a provincial cattle improvement fund into which would be paid donations *and other monies* received for the purchase and maintenance of breeding bulls *and other forms of cattle welfare purposes.* It is a sound principle that most of the money should be spent in the district in which it was collected.

SUBJECT NO. 1.

In Resolution no. 1, part (1) the words ' and States ' were deleted.

In part (2) the words ' or State ' were deleted.

Khan Bahadur Chaudhri Mohd. Din : Sir, it is the general policy of the States that a recommendation be added at the end of all the Resolutions that these are commended for their acceptance. The word ' States ' wherever they occur should be cut out.

The Hon'ble Sriman Gora Chand Patnaik : There are only two bodies mentioned in this Resolution. There is no provision for the creation of some other body which may perform the functions. Supposing

for instance there is an agricultural association and that body might function as the Cattle Improvement Board instead of having another body for the purpose. Why should we not make provision for that ?

Chairman : If you have got another organization there is nothing to prevent you from utilising it. We are not legislating here. We are here merely to get the machinery working.

Lt.-Col. E. W. C. Noel : May I suggest that instead of the word ' cattle ' the word ' livestock ' may be used. In our province sheep breeding is done on an extensive scale and there is no reason why they should not come under this Improvement Board.

Chairman : There is no objection to substituting the word ' livestock ' for cattle wherever it occurs.

PART (3) OF RESOLUTION 1.

Mr. R. C. Woodford : Is it really necessary to have this provision " That the provincial Cattle Improvement Boards would not undertake administrative functions ".

Chairman : It was at the instance of the Punjab Minister that this provision was put in.

The Hon'ble Sir Chhotu Ram : So far as these Boards are concerned, their position might differ from province to province. In every province these Boards will inevitably be composed of both officials and non-officials and non-official element will be derived from all sources. It may be derived from different districts and different divisions and the men sent up by the different districts or divisions might belong to a party which holds views entirely different from those of the party in power. Therefore the party in power cannot be bound down to accept the proposals put forward by this Board. If you entrust administrative functions to this Board, then the Ministry would be bound to carry out their proposals. I think it would be wrong in principle to entrust administrative functions to these Boards as such.

Mr. P. J. Kerr : I have been on several committees *ex-officio*. It does not mean that the expert officer's advice is always taken by the un-official committee.

Sir Madhorao G. Deshpande : I suggest that the cattle improvement board should have administrative functions also. You always put in un-official members, but you do not give them any powers.

The Hon'ble Sriman Gora Chand Patnaik : I agree that these bodies cannot have administrative functions, because there will be conflict of interests. Suppose the Board passes some orders which cannot be carried out by the Government. Then the Government might be placed in an awkward position. It is but right that the body should be only consultative and their resolutions should be placed before the Government for such action as they may think necessary. If non-officials want to take part in all these matters, there is the legislature where these things could be discussed. The legislature cannot shut out the non-officials from ventilating their views. Even the Government would be

bound to place their views before the legislature where the non-officials will have an opportunity of expressing their opinion. Therefore the interests of the non-officials will not be disregarded, and at the same time the Government will not be placed in an awkward position. I think it is but right that these Boards should not have administrative functions. I suggest the deletion of the last clause :

> " these would continue to be performed by the expert officers concerned ".

Chairman : I accept the amendment.

I should like to add that I am not in a position to commit the Government of India to any assistance. I have noted the wishes of the Honourable Ministers that the Government of India should contribute. I want it to be understood that that in no way commits the Government of India to any financial responsibility.

The Hon'ble Mr. G. C. Patnaik : The Ministers also do not commit their Provincial Governments to any of these Resolutions.

RESOLUTION 2.

This was adopted.

SUBJECT 2, RESOLUTION 1.

In line 2, after the word " grazing " insert the words " and grass land ".

In sub-paragraph (*i*), omit the words " the ", " and States " and " here represented ".

In Resolution 2, omit " States " in line 2. In sub-clause (*a*) after the word " shows " all the words should be omitted and the following substituted :

> " that this is not only a Reserved Forest problem but even more a problem of waste lands ".

At the end of the Resolution insert the following :

" and by the Forest Department on forest lands ".

Resolution no. 4 was amended and passed as follows :—

> The Conference being convinced of the need for a greater attention to the improvement of fodder and its best use and for deliberate crop planning directed to the greater production of fodder crops recommends that such special efforts should be made and such planning should form part of the regular propaganda by the agricultural staff in all provinces. Details must vary greatly with local conditions, but the fullest advantage should be taken of all favourable opportunities such as are afforded by the spread of high-yielding varieties of cash crops and the development of more intensive cultivation due to new irrigation facilities.

Chairman : I think that finishes our agenda, but I have just received notice from Khan Sahib Gabol to the effect that he wishes to move the following Resolution :—

> " That at the end of one year the Government of India may be informed as to what action has been taken and what progress has been achieved by the provinces on the carrying out of the resolutions passed at this conference."

What is your chief object of this Resolution, Mr. Gabol ?

K. S. Allah Baksh Khan Khudadad Khan Gabol : My reason is that at the end of one year each province should submit a report to the Government of India. Copies of that report should be circulated to all the provinces which will show what progress has been done by the provinces or whether they should approach the Government of India for financial help.

The Hon'ble Babu Gursahai Lal : I don't think any resolution of this sort is necessary, because some provinces may take up the work at once, and some may take up the work after a year.

Chairman : The general feeling is that this Resolution should not be moved.

K. S. Allah Baksh Khan Khudadad Khan Gabol : My purpose has been served, Sir.

Chairman : I think we have now finished the agenda, and I should like to thank the Honourable Ministers and their official and non-official advisers for having taken the trouble to come up here at great inconvenience to themselves in this trying weather. I am sure that the deliberations we have had since yesterday will produce important results and that they will be seen in the improvement of livestock in the provinces in the not distant future. It is unnecessary for me to emphasise the importance of this subject as H. E. the Viceroy has already said all that has to be said about it in his opening speech yesterday. I am sure that we are all agreed that the Conference where Honourable Ministers have been able to exchange views and also to inform the Government of India about their difficulties has not been void of results. I should like to thank you all, gentlemen, again for having come up to Simla and for the cordial and friendly spirit in which our discussions were carried out.

K. B. Choudhri Muhammad Din (Jodhpur) : May I say, Sir, a few words on behalf of the representatives of the Indian States ? We have derived great benefit from the discussions at this conference and from the observations made by the agricultural experts, and we shall now go back with greater knowledge, and we hope to carry into effect many of the suggestions for the benefit of our people in the States. Sir, this movement for the improvement of the livestock which has been inaugurated by H. E. the Viceroy is a very valuable one. The service to our dumb friends in this case is also service rendered to the cause of agriculture in India, and all this will tend to increase the prosperity of India. If the movement is continued with the same enthusiasm which you, and your staff have shown, then after a few years the beneficial results will be substantial to the peasantry and India will look back with gratitude to the Viceroyalty of Lord Linlithgow whose name will be immortalised.

The Hon'ble Rao Bahadur M. C. Rajah : Sir, on behalf of this conference it gives me great pleasure to thank you for having invited us here to this conference. You have given us an opportunity to meet the various reperesentatives of the provinces and to discuss some of the vital problems affecting the agricultural industry of this country. We also thank you, Sir, for the trouble you have taken in presiding over this conference in spite of the enormous work you have to get through. I also thank the other representatives who have come here and who have given their valuable advice to the conference which has now come to a successful end.

The Hon'ble Mr. B. G. Khaparde : Allow me to join in endorsing every word that has been said by the Honourable Minister from Madras, and we thank you very sincerely for having brought us together which gave us this opportunity to exchange views. I feel sure that some substantial good will result from the deliberations of this conference and India will be benefited in the long run.

Chairman : The conference now stands adjourned. I hope to meet members of the conference in a more pleasant atmosphere at tea.

The Conference then adjourned *sine die*.

APPENDIX I.

Resolutions passed at the Cattle Conference held at Simla, on the 25th and 26th May, 1937.

SUBJECT No. 1.

Resolution 1.

The Conference having noted the response to His Excellency the Viceroy's appeal for the provision of funds for the purchase and maintenance of approved breeding bulls, *being convinced* of the necessity for a sustained effort to improve Indian livestock and of the importance of continuity of policy in all livestock breeding *considers it desirable*—

(1) That there should be established in each of the Provinces represented a provincial livestock improvement fund into which would be paid donations or other monies received for the purchase and maintenance of breeding bulls and for other forms of livestock improvement. It is a sound principle that most of the money should be spent in the district in which it was collected ;

(2) That there should be set up in each province either a Provincial Livestock Improvement Board with suitable district or local committees or a provincial Livestock Improvement Association with district branches. It would be for each province to decide what form of organisation to adopt. It would largely rest with district and local committees or branches to maintain local enthusiasm and raise further funds ; and

(3) That there should be the closest possible liaison between the several Ministries of Agriculture and such Boards and Associations. The precise composition and functions of these bodies is a matter for the provinces to determine, but it is desirable that the Minister should be president except where that position is occupied by the Governor of the Province in which event the Minister would be Vice-President. It would be an advantage if such bodies include in their membership the permanent officials connected with livestock improvement. Provincial Livestock Improvement Boards would not undertake administrative functions.

The Conference noted the unanimous opinion of the provincial Ministers that the Central Government should make substantial grants to provincial Livestock improvement funds.

Resolution 2.

The Conference endorses the recommendation of the Cattle Improvement Sub-Committee of the Board of Agriculture and Animal Husbandry that adequate and suitable provision should be made for the proper maintenance, in such manner as may best suit local conditions, of all breeding bulls which may be presented in future.

SUBJECT No. 2.

Resolution 1.

With a view to securing systematic and progressive improvement in grazing and grass-land areas, and the conversion of waste land into useful grazing, wherever that is possible on an economic basis, *The Conference Recommends* :—

(i) That, in all Provinces standing Fodder and Grazing Committees should be established on the lines recommended by the Board of Agriculture and Animal Husbandry in India ; and

(*ii*) That a central committee to co-ordinate grass-land and fodder research and the dissemination of information should be set up by the Imperial Council of Agricultural Research.

Resolution 2.

Whilst recognising that conditions vary greatly in different Provinces and localities the Conference is agreed upon the following general conclusions :—

(*a*) The report of the Special Committee on Forest Grazing shows that contrary to popular belief this is not only a Reserved Forest problem but even more a problem of waste lands ;

(*b*) That great improvement in existing grass lands is possible by controlling the periods during which individual areas are open to grazing and by limiting the number and species admitted. Without such control deterioration is progressive and frequently the poorest cattle are found where grazing is unrestricted ;

(*c*) That good grazing is essential for the production of hardy young stock especially of the draught breeds and is therefore of special importance in all definite cattle-breeding areas.

(*d*) That it has already been shown by experiment that, under control, several types of waste land can be improved to yield an appreciable amount of grazing and hay ;

(*e*) That there is scope for much useful experimental work on grass-land improvement in many parts of India and that definite schemes of experimental work should be initiated by the Provincial and Central Fodder and Grazing Committees and by the Forest Department in Forest lands.

SUBJECT No. 3.

Resolution 1.

The Conference is convinced of the need in every province for a Live-stock Division with a separate allotment of funds for live-stock improvement work and controlled by a livestock expert whose whole time is devoted to that subject. It is probable that the ultimate solution in each province will be found in the eventual establishment of unified department under one Minister embracing Plant Industry, Animal Industry, the control and prevention of animal diseases, the marketing of crop and animal products and rural co-operation with technical heads for the appropriate divisions.

Resolution 2.

Additional staff of all grades is required for livestock work and much can be done by the creation of a class of trained stockmen : Provided that the Head of the Livestock Division has an adequate supervising staff.

Resolution 3.

It is also suggested for the consideration of provinces that the best possible use should be made of existing staff and, in particular, that in those provinces which have not completely provincialised their veterinary staffs there should be a clear division of responsibility for veterinary work. Local bodies might be responsible for the maintenance of veterinary hospitals for the treatment of ordinary diseases and casualties and should retain control of the veterinary assistant surgeons required for that purpose. The rest of the veterinary assistant surgeons would form a disease control staff at the disposal of the Directors of Veterinary Services and these assistants could render substantial assistance in livestock improvement work.

SUBJECT No. 4.

Resolution.

The Conference being convinced of the need for a greater attention to the improvement of fodder and its best use and for deliberate crop-planning directed to the greater production of fodder crops recommends that such special effort should be made and such planning should form part of the regular propaganda by the agricultural staff in all Provinces. Details must vary greatly with local conditions but the fullest advantage should be taken of all favourable opportunities such as are afforded by the spread of highyielding varieties of cash crops and the development of more intensive cultivation due to new irrigation facilities.

Resolution.

The Conference recommends that the above Resolutions be commended to the notice of Indian States for their careful consideration and such action within their own territories as may suit their special conditions.

APPENDIX II.

Notes on subjects discussed at the Cattle Conference held at Simla, on the 25th and 26th May, 1937.

SUBJECT No. 1.

The setting up of suitable provincial cattle improvement funds on the lines suggested by the Animal Husbandry Wing of the Board of Agriculture as the best means of following up His Excellency the Viceroy's campaign for providing breeding bulls.

Note by Imperial Council of Agricultural Research.

Though there are a few outstanding examples of individual effort it is broadly correct to say that cattle improvement work in India is carried on by Government either independently or through certain private or semi-official organisations. The activities of Government include the breeding of bulls in Farms and distribution in villages of these bulls as well as other approved animals bred by private individuals. In the past each province has pressed the need for some system of subsidy either for the purchase or maintenance of these animals or both. The system differs from place to place, but in essence it is either the payment of a fixed sum of money for maintenance, the offer of a bull free, a contribution towards its purchase, or some other form of premium. In many instances the cost thus incurred is shared by the local Government and the District Boards. The number of bulls thus distributed in each province is quite inadequate to effect any marked improvement on the huge livestock population, but the response received to the appeal issued by His Excellency the Viceroy for the donation of pedigree bulls has been so good that this should go a long way to fill up the gaps, provided that suitable organisations are set up to secure continuity of effort. Two of the chief desiderata are :—(*i*) to make arrangements for the registration of the accredited progeny of all approved bulls, a point which will be elaborated later, and (*ii*) the establishment in each province of a cattle improvement fund adapted to local conditions, as recommended by the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry last December.

In discussing measures necessary for giving full effect to the scheme of cattle improvement initiated by His Excellency the Viceroy, the Advisory Board of the Imperial Council of Agricultural Research, at its meeting held in July 1936, recommended *inter alia* that for the maintenance of bulls it is necessary to establish definite funds, the proceeds of which should be devoted partly to the purchase of bulls and partly to their maintenance. This recommendation not only stresses the necessity for funds but also emphasises that, whenever bulls are purchased or presented, adequate provision should be made for their maintenance. The Livestock Improvement Sub-Committee of the Animal Husbandry Wing, which met at Madras in December 1936, went a step further and recommended that in future no gift of a bull should be accepted unless it is accompanied by suitable provision for maintenance. It will be recollected that such provision was made in His Excellency's original gift and by many of the donors who followed his example.

It is clear that what is needed in each province and State is a permanent fund controlled by a suitable permanent organisation, which will see that the money available is utilised to the best possible advantage, and which should perhaps be largely un-official in character.

Certain tentative steps have already been taken. At the Centre there has been set up a fund, which is composed of donations received by His Excellency the Viceroy direct, and contributions from this are being utilised in the manner specified by the donor.

In Madras it is proposed to start a central fund out of donations received. This fund will be dealt with by the Provincial Economic Council and distributed as required to District Boards.

In Bombay some difficulty is being met with in utilising the donations because some donors desire to earmark their gifts for particular villages in a manner incompatible with any definite scheme of livestock improvement. Attempts are being made to create a Central fund to be placed at the disposal of the Livestock Expert for use for Cattle improvement.

In the Punjab all moneys are paid to District Boards for supplementing their normal efforts at cattle improvement.

The Cattle Breeding policy of the United Provinces is controlled by a Provincial Board. This Board has District Cattle Improvement Committees under it, and all donated funds are allotted to these committees.

In Bihar and the Central Provinces, Provincial Cattle Breeding Associations have been formed, and these will presumably have funds at their disposal for distribution.

A Cattle Breeding Society has been formed in Orissa with His Excellency the Governor as Chairman. It is proposed that this Society shall purchase and maintain bulls and control breeding policy.

In Assam it is proposed to establish a Cattle-Breeding Association for the Province, with local branches. This Association will control breeding work and will deal with the donations of bulls and money received.

In the North-West Frontier Province, it is proposed that all funds collected and donations received should be used to supplement the bull subsidy scheme they have in force. No separate organisation has yet been provided.

It will be observed from the above that there is considerable variation in the organisations which are being set up in the different provinces to deal with the matter, but absolute uniformity cannot be expected and indeed is not advisable, providing the arrangements for the collection and distribution of funds are of a permanent character, and that both officials and non-officials interested in livestock improvement are represented on the board of control.

The establishment of such funds has been recommended primarily with the object of providing funds for the maintenance of pedigree or approved bulls, but it might also be used to provide some of the staff so urgently needed for recording the performances of the stock of these animals, so that demonstrations of the improvement effected may be arranged for display at agricultural exhibitions, cattle shows, etc. This involves the recording of the services of approved bulls, the registration of their progeny, the maintenance of provincial registers for approved animals, the opening of provincial herd books for specified breeds in selected areas, and milk recording when milch breeds are being dealt with. Of the above items, the first four will usually be performed by the person in charge of the bull and the executive staff of the department charged with livestock improvement, but in regard to milk recording in the villages, the Animal Husbandry Wing which met in Madras in December 1936 held that this could not be done without special staff. The importance of making a commencement in this direction in certain areas, however, is obvious and any funds that could be spared for the special subordinate staff required would be well spent.

SUBJECT No. 2.

The improvement of grass lands and the better utilisation of waste and surplus land for fodder production and the initial steps to be taken in that direction by the various appropriate agencies.

Note by Imperial Council of Agricultural Research.

This particular subject on the agenda bristles with administrative difficulties but the main lines to be followed in improving grass lands are fairly well-known.

The Royal Commission on Agriculture remarked " We are well aware of the difficulties likely to be met with in practice in getting owners of cattle to adopt more rational methods of utilising the diminishing grazing areas of India, but the poverty of so large a proportion of the breeding herds of the country is such a serious handicap to the improvement of agriculture, and the management of the available grazing lands is so bad, that a great effort to alter existing conditions is necessary, and is indeed long overdue ".

In considering this question, it must be remembered that grazing lands in India are of two kinds, *viz.* :—those administered by the Forest Department and those under private ownership or included in the term " waste lands ".

As regards British India, the Royal Commission pointed out that of the total area of land about 20 per cent. is administered by the Forest Department and 45 per cent. is classified as " cultivable waste " or " land not available for cultivation " and it made the recommendation that the classification of this large area representing 65 per cent. of the total area of British India should be re-examined with a view to providing better grazing facilities for India's live-stock.

With reference to the area now administered by the Forest Department, the Commission stated " The ideal to be aimed at in all provinces is to distinguish between land which is suitable neither for timber, fuel plantations nor for ordinary cultivation, but may possess possibilities for development as fodder reserves and grazing grounds ", while in regard to waste land it remarked " We think it likely that within these vast areas there could be found much land which, although unsuited for commercial afforestation, might be used to grow fuel and provide better grazing than it now does ".

An important step to give effect to these recommendations of the Royal Commission was to hold, in connection with the last Animal Husbandry Wing meeting of the Board of Agriculture, a preliminary meeting of forest and other officers in Madras in December 1936 and a copy of the report of that Conference is attached to this note.

That report will no doubt be read with great interest by those studying this subject, but attention may be drawn to some of its salient features.

In the first place, it points out that of the four main groups into which reserved forest land is usually divided, only groups (*c*) and (*d*), *viz.* :—poor coppice, scrub or thorn forests, and true pastures are suitable for use to any extent for grazing. Several methods of improvement which have been introduced are referred to and other lines awaiting investigation are mentioned, such as the " safety incidence " of various types of grassland and the nutritive value of different grasses. The question of exercising control, whether by the levy of enhanced fees or otherwise, is also raised. It seems to be the intention of the Committee that the initiation of further measures of improvement should be left to the Forest Department, but it would appear desirable that the Standing Fodder and Grazing Committee, which is recommended for each province under Part II of the report, should be in a position to make recommendations and give advice in regard to the treatment of the areas classed as (*c*) and (*d*).

Attention is invited to the conclusions of the Committee on this part of the report, particularly to the statement that power to control both periods of closure and numbers utilising the grazing is absolutely essential to proper management and should be provided, if necessary, by legislation.

One striking point that emerges from this report is the fact that in the five provinces examined, *viz.* :—United Provinces, Madras, Punjab, Central Provinces and Bombay only 8¼ million out of 97 millions of cattle are in a position to avail themselves of forest grazing, so that obviously the better utilisation of waste lands is a matter of more economic importance. Forest grazing lands, however, can make an important contribution to the subject as in them control can more easily and quickly be applied. Their value as demonstration areas is great. Cases in point are the greatly improved growth of grass in some of the Punjab hilly tracts, where bunding work to prevent soil erosion has been carried out, the reclamation work in the Jamna-Chambal ravines by the United Provinces Forest Department, the exact and continuous work in Bombay which includes both pasture improvement and land conservation, and the introduction into certain areas in Assam, where cattle are kept under ranching conditions, of better method for selecting their breeding bulls, castration of the surplus made animals, and vaccination against contagious disease.

As already observed, the Royal Commission on Agriculture recommended 10 years ago that systematic investigation of the possibilities of waste lands as producers of fodder and fuel should be undertaken, but it seems that, with a few notable exceptions, no effort in this direction has yet been made. Owing to the large increase in population that is taking place in India, with a consequent demand for more land for cultivation, this problem is now a very urgent one. The Conference of Forest Officers also emphasised this point and as an illustration of what might be done they quote the case of certain *Usar* lands in the United Provinces where, simply by closing the lands to grazing during the monsoon, the yield of hay has risen in 5 years from 2.75 maunds to 15 maunds per acre.

In order to implement the recommendations of the Royal Commission on a wide scale the Special Committee of Forest Officers recommended the setting up of a Fodder and Grazing Committee in each province. These recommendations were accepted by the Animal Husbandry Wing of the Board of Agriculture, with the modification that each Provincial Committee should include a botanist and an agriculturist, and also a veterinary officer if the animal husbandry officer did not possess veterinary qualifications. These Committees will undertake the re-classification of waste land outside Government forests and select areas fit for the production of fodder or for use as grazing grounds. They will also advise the local Governments as to the best agency for the management of such lands, and will, no doubt, indicate the lines along which investigations are needed and improvements in management are required, and it is proposed that their work should be co-ordinated by a Special Fodder and Grazing Committee of the Imperial Council of Agricultural Research.

As it is proposed that the latter Committee should meet at the next meeting of the Advisory Board of the Imperial Council of Agricultural Research in September 1937, it is desirable that the Provincial Committees should be set up without delay, so that their representatives at the central meeting will be in a position to describe the special problems in each province and arrive at general conclusions in regard to the main lines of improvement to be followed throughout India.

REPORT OF THE PRELIMINARY CONFERENCE ON THE BETTER UTILIZATION OF FOREST AREAS FOR GRAZING.

Terms of reference.

(*i*) To examine the existing methods of management of forest grazing areas with a view to ensure that they provide the best type of grazing and are used as far as possible for the preservation and improvement of the best type of cattle ; and

(*ii*) the possibilities of developing the utilization of ravine and other derelict land outside Government forests for grazing purposes in order to supplement the facilities for grazing provided in Government forests, and to make recommendations.

Report—Part I.

The preliminary conference convened for the consideration of item 34 of the Agenda—The Better Utilization of Forest Areas for Grazing—has had placed before it full reports from all Provinces and Presidencies. These reports have included detailed statistics of incidences of grazing on forest land, percentages of the total cattle and live-stock populations which utilize forest grazing, and percentages of forest land to total areas. These figures, though of the greatest interest, cover so wide a variety of conditions that it is not possible to compress them into a brief report. Selected figures also might give a false impression of the position as a whole. It has therefore been decided to deal with the subject on broad general lines for India as a whole.

2. Grasses resemble trees in constituting crops with a wide diversity of utility. But, considering their value as a cheap source of fodder it seems that grasses have been strangely neglected in the past, both as regards detailed scientific research into their individual nutritive properties and as regards investigations into the best methods of their treatment as crops. The layman is apt to consider all grasses as producing grazing, just in the same way as he tends to assume that all trees produce timber : in each case a uniform commodity provided by nature with no, or only trivial, assistance from man. All Forest Officers, as producers of timber, realize the deplorable fallacy in such ideas. Also as managers of land, Forest Officers have a considerable interest in the occurrence and utilization of grasses, though usually only as a side line to their main business. The natural occurrence of grasses as well as of trees is governed by a combination of the factors of topography, climate and soil. And in India, generally speaking, the grasses take an important place in the vegetation under conditions which normally inhibit the production of the best timber.

3. A rough, but convenient, general classification of the vegetation in areas which come under the management of the Forest Department in India distinguishes four main types :—

(*a*) The coniferous forests of the Himalayas.

(*b*) All other timber forests.

(*c*) Poor pole, scrub or thorn forests.

(*d*) True pastures.

Class (*a*) includes at lower levels the chir pine forests (*Pinus longifolia*). Here the undegrowth is typically grass which provides grazing of indifferent quality. Closures for reproduction of the pine crop are the only closures made. Over the rest of the area in the Punjab and Kumaon Himalaya unrestricted grazing under rights or concessions is permitted. Early burning is carried out for fire protection and nothing more can be done to improve the grazing. At

higher elevations the forests consist typically of *deodar* (*Cedrus deodara*) and the first beneath which the forest floor is usually bare of all plants suitable for grazing other than a few weeds during the rains.

4. In class (*b*) are placed other forests yielding timber, as visualised in Resolution no. 22-F. of 19th October 1894. It includes the great *sal* (*Shorea robusta*) belt of the foot-hills and parts of the Central Provinces, Orissa and Chota Nagpur, the better quality teak (*Tectona grandis*) forests of the Central Provinces, Bombay and Madras, and the tropical evergreen forests of southern and western India. In these areas grazing is usually of little value and where carried out under rights, is generally harmful. In the miscellaneous forests included in *sal* divisions, grazing is carried on under the prescriptions of the local forest working plans. These plans take into account all privileges and rights acknowledged under the Revenue settlements in force in the districts concerned. They are invariably scrutinized by the Revenue authorities before being sanctioned by Government. Subject to careful avoidance of any interference with the acknowledged rights and privileges, closures to grazing are usually applied solely with reference to the avoidance of physical injury to young tree crops after exploitation of mature timber. Owing to the fact that climatic conditions which are suitable for the growth of timber forests are seldom such that fodder grasses can take any place in the climatic climax vegetation, the grazing available is usually of the coarsest quality and in little demand.

5. *Class* (*c*).—*Poor Coppice, scrub or thorn forest* covers the great bulk of the remainder of the lands controlled by the Forest Department. In some provinces this class also extends over large acreages of private lands or lands classified as "cultivable waste" under the Revenue Department. In other provinces in accordance with the policy of the Government of India, which was introduced in their Resolution no. 17-A-105 of 15th July 1891 calling for tripartite classification of all land into :

(1) Cultivation,

(2) Pastures and Fodder Reserves,

(3) Forests properly so called.

Much land was formally notified as Reserved Forest simply for administrative convenience in order that it might be brought under some organized management. The objective was specifically stated in the Resolution not necessarily to be the production of trees, and the agency for management was not necessarily to be the Forest Department. It was also clearly laid down that pastures meant grazing grounds which were to be brought under a definite system of management. Such land is usually in areas of light rainfall and carries a crop consisting principally of grasses and shrubs, interspersed more or less profusely with poor pole, scrub or thorn forest in accordance with local increase or decrease of soil moisture. A considerable percentage of it might therefore be designated as wooded pasture. Unfortunately, because of the light rainfall, this type of natural vegetation is highly vulnerable to ill-treatment and much more easily destroyed than vegetation with a heavier rainfall. It was therefore in greatest need of careful management. But the history of these lands has almost always been that, until recent years, not only have they received the least scientific management : they have also frequently been, in all senses of the phrase, a "no-man's land". In the Bombay Presidency in 1898 and again in 1910 large areas in the Deccan, totalling roughly 1,500,000 acres, were removed from the control of the Forest Department and placed under the Revenue Department who have neither the staff, the time, nor in the majority of cases the technical knowledge, to regulate the grazing utilization in any way. In the Madras Presidency in 1924 some 3,400 square miles of lands formerly managed by the Forest Department were transferred to control by village panachayats. In its latest review of the working of these forest panchayats in Madras Presidency the Board of Revenue has remarked

that, " Most of the Collectors report that the ordinary revenue staff has not been able to devote the requisite attention to the panchayats with the result that many of them are left to take care of themselves. The forests have in consequence deteriorated to some extent ".

6. In areas in this class (*c*) which are still under organized management by the Forest Department grazing is regulated by the prescriptions of the local Forest Working Plans, and in the past these prescriptions were usually similar to those for timber forests. In recent years however, as these plans have come up for revision, the grass crops have received increasing consideration in conjunction with the tree crops, since the former frequently represent an important part of the climax vegetation under the climatic conditions in which these pole, scrub and thorn forests occur. In the Central Provinces every Working Plan includes an elaborate grazing settlement. When the Working Plan is completed as far as silviculture is concerned and approved by the Chief Conservator of Forests, Government appoints a Special Revenue Officer to examine and report on its effect on the local population, and a most important part of his work is the grazing settlement. This is put up in skeleton by the Working Plan Officer and he and the Special Revenue Officer work out the details on tour together. The forests are divided up into grazing units, which are geographical areas, fixed on the demand for grazing. Where demand is heavy units may be small, usually a few thousand acres, but perhaps as small as a few hundred. Where demand is light, units are large and may be several hundred square miles. Each unit is then examined in detail. The average area open to grazing is calculated by deducting the average area closed from the total area. From the incidence for the type which varies from 1 to 3 acres per head, the number of cattle admissible is then calculated. This is compared with demand as obtained from past figures and by enquiry direct from the villages concerned. When exclusions are necessary, cattle from villages at a distance or which graze only occasionally are first excluded ; sometimes transfers can be made to other units almost as convenient but this requires careful arrangement. If the demand is still in excess of the number admissible exclusions are made by classes. Plough cattle up to four per plough are admitted first, under the head of privileged cattle. After that ordinary cattle (or milch cattle) are admitted up to four per plough. After that additional and commercial cattle can be admitted up to the limit. As an example in some units of Nimar division, four privileged cattle and two ordinary cattle are admitted per plough. Each unit is described and defined in the Working Plan and if grazing demand is fairly heavy the villages allowed to graze are listed to the unit. Such a system for the control and management of grazing areas is to be highly commended. In one division in the Madras Presidency (*viz.*, Nellore), an ancient system known as the Kancha system prevails. This division is noted for its superior class of cattle. Under the kancha system the grazing area is divided into convenient blocks which are leased. The lessee (the kanchadar) issues permits to the ryots at rates ranging from 4 annas to Rs. 1-8-0. He is bound by the terms of his agreement to protect the block, to close it to grazing for three months commencing with the monsoon, and to limit the admission of cattle to the possibility. This system has largely contributed to the preservation of the fine breed of cattle for which this division is famous. Elsewhere in India grazing in this type of forest is free by right and without any restriction in number, with the result that not only have the forests been ruined both for the production of wood and grass, but erosion has become a major problem.

In the United Provinces, in Bundelkand and Ajmer, a special point is made of closure to grazing during the four monsoon months and slow and steady improvement is reported as compared with neighbouring village waste which is open to uncontrolled grazing throughout the year. The Forest Working Plans for Saharanpur, Gonda and Banda divisions, prescribe up to two square

miles of new plantations to be made annually in which a mixture of timber species (chiefly *Dalbergia sissoo, Acacia catechu* and *Bombax malabaricum*) are raised with a varying proportion of fodder species for lopping (*e.g., Terminalias, Bauhinias, Kydia calycina,* etc.). These plantations are made in lines between temporary cultivation of field crops and after the cultivation is abandoned the subsequent grass crop is generally decidedly better than that formerly occupying the ground. Useless bushes and shrubs have also been eradicated by the cultivation.

In Bombay Presidency special rotations for the improvement of the grass crops have been introduced in East Khandesh district for all the areas of this class under the management of the Forest Department. Each compact area is divided into convenient blocks and each block is subdivided into five compartments each of which receives the same treatment on a five-year cycle. This treatment is as follows :—

Year.	Graze.	Close.
1 ..	15th June to 31st August, 2½ months	1st September to 14th June, 9½ months.
2 ..	1st November to 14th June, 7½ months	15th June to 31st October, 4½ months.
3 ..	1st September to 14th June, 9½ months	15th June to 31st August, 2½ months.
4 ..	15th June to 14th June, 12 months ..	....
5 ..	15th June to 14th June, 12 months ..	....

This sequence results in grazing being available in the following compartments of each block during each year of the cycle :—

Year.	15th June to 31st August.	1st September to 14th June.	1st November to 14th June.
1	1, 2, 3	2, 3, 4	2, 3, 4, 5
2	2, 3, 4	3, 4, 5	3, 4, 5, 1
3	3, 4, 5	4, 5, 1	4, 5, 1, 2
4	4, 5, 1	5, 1, 2	5, 1, 2, 3
5	5, 1, 2	1, 2, 3	1, 2, 3, 4

This cycle is superimposed on a 30-year felling cycle for coppice poles and fuel. The system has been in force for 5 years and has resulted in definite improvement in the quality and quantity of the grasses. A similar system with some slight modifications has now been proposed for introduction in the whole of the adjoining district of West Khandesh.

In the Punjab the Forest Department is powerless to introduce improvements owing to the fact that unrestricted free grazing has been given as a right. The foot-hills have in consequence been denuded of their vegetation and the consequent erosion of these tertiary rocks is appalling. The question of the ameliorative treatment of areas outside the control of the Forest Department is dealt with under Part II of our terms of reference. All that need be said here is that generally the high hopes as to the future of areas handed over for management by panchayats, advisory boards, and similar bodies do not appear to have been realized. Grasses emphatically form a very specialized type of crop and just as for trees or field crops expert knowledge and skilled management are essential.

7. The last class of land class (*d*) consists of true grazing grounds where grass and not trees is the climax vegetation. So far as the Forest Department sphere of control is concerned these are limited to the Alpine pastures and the considerable areas in the Terai in the United Provinces and Assam. In neither case are any special steps considered to be necessary at present for the improvement of the grass stock. In the terai grazing improves the quality of the herbage which otherwise is excessively coarse. The Alpine pastures are too remote for any control to be feasible.

8. Figures put before us make very clear the fact that the grazing which can be made available in lands in charge of the Forest Department can exert only an almost trivial influence upon the vast problem of the improvement of India's livestock as a whole. Representatives from the United Provinces, Madras, Punjab, Central Provinces and Bombay have been present at this preliminary conference and the following summary taken from official figures gives the numbers of livestock which at present utilize forest grazing and their incidence per acre. For comparison with the above are given the total livestock populations in each of the above provinces and for the whole of India. These figures have been further analyzed so as to show the proportion of livestock which obtain grazing in forest lands, and their incidence per square mile. For comparison with the above the incidence is given of all the remaining cattle in each province on lands which may be considered as possibly available for grazing outside forest lands. These include all lands which are classified either as not available for cultivation, or as cultivable waste excluding fellow.

Forest Grazing Lands.

Province.	Total area of forest lands in square miles.	Area open to grazing in square miles.	Numbers of Livestock in thousands uiliz-ing forrest ‡ grazing.					Numbers per square mile of open area and acreage available per head.	
			Buffaloes.	Cows and bullocks.	Sheep and goats.	Others.	Total.		Acs.
United Provinces	6,000	4,000	146	883	250	10	1,289	322	2
Madras ..	16,000	14,000	108	1,370	732	..	2,210	158	4
Punjab ..	5,200	4,700	247	866	1,557	56	2,726	580	1·1
Central Provinces	19,400	17,000	312	2,500	300	5	3,117	183	3·5
Bombay ..	14,000	12,400	353	1,514	542	17	2,426	195	3·25
Total ..	60,600	52,100	1,166	7,133	3,381	88	11,768	226	2·8

1935 Census Figures for total livestock populations in thousands.

United Provinces excluding Kumoan	9,293	23,177	10,002	818	43,290	
Madras	6,817	17,790	18,700	203	43,510	
Punjab	6,048	9,792	8,589	1,398	25,827	
Central Provinces	2,194	11,650	2,193	185	16,222	
Bombay	2,513	7,448	3,790	200	13,951	
Totals ..	26,865	69,857	43,274	2,804	1,42,800	
Rest of British India	4,768	42,147	15,111	539	62,565	
Indian States 66 per cent. ..	12,351	42,022	33,752	1,790	89,915	
Total All-India ..	43,894	1,54,026	92,137	5,133	2,95,280	

Estimated areas available for grazing outside forest lands and numbers of livestock which are not in a position to take advantage of grazing in forest lands.

Province.	Livestock in millions.	Area available. (Square miles.)	Incidence per square mile.
United Provinces	42	31,000	1,335
Madras	41·3	51,000	801
Punjab	23	42,000	548
Central Provinces and Berar ..	13·1	30,000	437
Bombay	11·5	40,000	287

These figures show that the numbers of livestock which are in a position to take advantage of facilities for grazing in forest lands are only a very small fraction of the whole livestock population. The figures are for cattle alone :—

United Provinces	1	million	out of	32½ millions.
Madras	1½	„	„	24½ „
Punjab	1	„	„	16 „
Central Provinces	3	„	„	14 „
Bombay	2	„	„	10 „

This gives for these 5 provinces, only 8½ million out of a total of 97 millions.

We are not in a position to state whether any, and if so, what proportion of this vast livestock population may be fairly considered as uneconomic. From such figures as are at our disposal the indications seem to be rather that distribution and quality rather than quantity are faulty, and that while there is probably a shortage of good working bullocks in the areas of intensive cultivation, there is certainty an excess of scrub animals in the areas where cultivation is least extensive and grazing lands are commonest. How far this can be correlated with the production of cultivated fodder crops we are also not in a position to give any definite opinion but figures have been quoted to us in the specific example of the Meerut and Muzaffarnagar districts in the United Provinces as compared with Jhansi district in the same province. It has been stated that cattle in the former districts appear to be superior to those in Jhansi. It is a fact that in Meerut and Muzaffarnagar there are some 200 to 250 acres of cultivated fodder crops and only 250 acres of grazing lands to every 1,000 head of cattle ; whereas in Jhansi there are 750 to 1,000 acres of grazing lands and only 1 acre of cultivated fodder crops to every 1,000 head of cattle.

9. For forest lands in the five provinces represented at this Conference the incidence of grazing varies from 1.1 acre per head in the Punjab to 4 acres per head in Madras and averages 2.8 acres. But these lands include all the

dense timber forests, in which there is very little real grazing available. Moreover the figures are "over-all" averages for very large areas, a quite high percentage of which are utterly remote from all cultivation and habitation. There can therefore be no question that the incidence on the fringes of forest lands, near villages, and also around sources of water-supply in the interior where temporary or semi-permanent camps may be set up, must be quite unreasonably high. Everyone who has made a study of grazing management has repeatedly emphasized the fact that, not only is improvement in the quality of the grasses impossible, but deterioration is practically inevitable unless the incidence of utilization can be controlled. Such control must include limitation of numbers as well as period of utilization. Closures in rotation will ameliorate the condition of the crop ; but full control of the numbers admitted to graze is essential for real improvement. We have no exact information as to what may be the correct figures for numbers per acre. Obviously it must vary greatly in every locality, being dependent not only upon natural vegetation but also upon the result of past treatment. Nor have we any information as to the varying quality of forest grasses. From observation it appears likely that the relatively coarse grasses of the timber forests are probably poor in nutrients and useful only as roughage. The fine grasses of our (*c*) class pole, scrub or thorn forests are much better. There is a generally accepted empirical figure that about two acres per head of cattle is the minimum average which can be permitted with safety. But it is our opinion that both these questions of safety incidence, in various types of grass land and the nutritive qualities of different grasses are deserving of special research. Unfortunately up to now in all provinces except the Central Provinces, the safe incidence of utilization has been of purely academic interest. The charging of reasonable fees for grazing could be an indirect method of control. In the Punjab the vast majority and in the United Provinces some 68 per cent. of the animals utilizing grazing in forest lands are allowed to do so free, as an admitted right. In other provinces free grazing is frequently allowed in greater or lesser proportion as a privilege. But everywhere those animals which are required to pay fees are charged merely some token amount which bears no relation whatever to the economic value of the grazing at their disposal. These fees vary in amount but are usually between two and eight annas per annum for bulls, bullocks and cows and twelve annas to rupees two for buffaloes. Calves are usually allowed free. Sheep and goats in the Punjab pay three-fourths and two annas respectively per annum. These token payments also usually carry with them legal permission to graze over such extensive areas, for example, in Bombay Presidency roughly 3,000 square miles, that any control is automatically made impossible. Simultaneously the low rate charged actively tends to encourage the increase in numbers of useless animals. Yet even these trivial amounts are made the subject for agitation as is shown by numerous debates in Provincial Legislative Councils and also in the Council of State. The present position seems to us to be a typical example of a vicious circle. The Forest Department has demonstrated already, as is shown by the examples quoted in paragraph 6 above, that much improvement is possible, by proper management, both in the quality and quantity of the grazing available in forest lands of class (*c*) type. Without control of the animals utilizing the improved crops, however, all such improvements are inevitably quickly dissipated by excessive grazing. They merely serve, during their existence, to encourage the survival of still larger numbers of uneconomic scrub animals. A very low rate of uniform fee encourages this process even further. The trivial fee received and the feeling of wasted effort combine to discourage the continuation, and still more so the extension, of any improvements which will cost money. Whereupon the villagers, not unnaturally, complain that the Forest Department does nothing for the money it receives from them and therefore they agitate for free grazing.

10. Our terms of reference also require us to consider whether the existing methods of management of forest grazing areas ensure that these are used as far as possible for the preservation and improvement of the best type of cattle. At various times and places the possibilities of exclusion and admittance according to quality or type of animal have been considered. The conclusion has been that any such procedure involves such difficulties as to be impracticable. This is of course no reason why further efforts should not be made in this direction. Limitation by quality however presupposes limitation of numbers and the latter is necessarily antecedent to the former. Here again, therefore, the charging of reasonable fees might produce the desired result. We desire also to emphasize the point that grazing grounds upon which unlimited numbers of livestock can be maintained at no, or entirely trivial, cost inevitably become a factor encouraging the deterioration of livestock. There can equally be no question that these same grounds, with proper management, should, and could, be a valuable factor in the improvement of the cattle of India. We are advised that, especially for maintaining the quality of draught breeds of cattle, grazing is a most desirable supplement to stall feeding. Control, involving limitation of numbers as may be necessary, over the cattle utilizing the grazing in forest lands is a crucial necessity without which proper management is impossible. Limitation can be effected in two ways : directly by executive order or indirectly by economic pressure through fees. By the first method full control can be exercised and must vest in an expert in order to insure as far as possible that proper use is made of this power. The second method is indirect, uncertain and probably somewhat slow in taking effect, and may be open to political misinterpretation as an increase in taxation. Its exact financial effects are difficult to forecast, but would increase the revenue at present received in most provinces very considerably. The precise manner in which control should be provided is therefore a matter of policy which Government alone can decide.

11. Our considered conclusions are—

(1) That there is scope for further improvement in the quality and quantity of grazing produced by forest lands of the type which at present carry principally poor pole scrub or thorn forest and for the improvement of the amenities of grazing by the provision of better water-supplies.

(2) That such improvement can only be effected by the provision of scientific management by a competent staff.

(3) That power to control both periods of closure and numbers utilizing the grazing is absolutely essential to proper management and must be provided, if necessary, by legislation.

(4) That proper management must involve expenditure which will not be immediately remunerative, and from which even the ultimate returns will very probably be mostly indirect. The mode of provision of the necessary funds must be decided by Government. Such expenditure should not be imposed as a further burden upon the budgets of commercial or quasi-commercial departments.

Part II.

12. Turning now to the second of our terms of reference, *viz.*, "to examine the possibilities of developing the utilization of ravine and other derelict land outside Government forests for grazing purposes in order to supplement the facilities for grazing provided in Government forests, and to make recommendations" we would like to point out, at the very outset, that it is impossible "to

supplement the facilities " in Government forests for grazing for *all* the cattle in India. An overwhelming majority can never get near Government forests and even with the most intensive utilization of the land available, the total fodder-supply from grazing grounds in Government forests must always be far short of actual requirements.

13. Out of the 97 million cattle in the Punjab, United Provinces, Central Provinces, Bombay and Madras, only 8½ million can visit the forests ; and it is desirable that better arrangements should be made for the fodder requirements of the remainder. The desirability of investigating the possibilities of utilization, for the purpose of fodder production, of ravine and derelict lands outside the forest is clearly indicated. The Royal Commission on Agriculture pointed out that about 20 per cent. of the total area of British India is administered by the Forest Department and another 45 per cent. is classified as " cultivable waste or land not available for cultivation " ; and recommended that the classification should be re-examined with a view to providing better grazing facilities for India's livestock. The Commission stated, " The ideal to be aimed at in all provinces is to distinguish between land which is suitable for the growth of good timber trees or for fuel plantations, and land which is suitable neither for timber, fuel plantations nor for ordinary cultivation, but may possess possibilities for development as fodder reserves and grazing grounds." The Commission further recommended that after reclassification such areas should be administered by a special branch of the Forest Department as a demonstration of what can be done under scientific control. The report continues " Nor do we think it likely that it will ever receive the attention that should be given to it unless it is placed under the management of a division of the Forest Department directly responsible for its development ". With regard to the areas classed as " cultivable waste " and " land not available for cultivation," the Commission remarked, " We think it likely that within these vast areas there could be found much land which, although unsuited for commercial afforestation, might, if placed under the charge of a Minor Forest division, be used to grow fuel and provide better grazing than it now does ".

14. Our reply to the first of our terms of reference shows that such reclassification of areas now under the control of the Forest Department is unnecessary. This classification has already been done ; and at every revision of a working plan of any forest division (generally every ten years) a complete re-survey of the area is carried out ; the classification is brought up to date and the management is modified accordingly. The Central Provinces have elaborate grazing plans, evolved with the co-operation of the Revenue Department, which are incorporated in each working plan. In the United Provinces and in other provinces where conditions so necessitate, working plans make separate provision for grazing facilities in grazing working circles.

15. The reclassification of areas described as " cultivable waste and land not available for cultivation " (hereinafter referred to as waste land) lying outside Government forests is, on the other hand, extremely desirable and should be carried out as early as possible. It is likely that the existing classification will be found to be out of date considering the rapid strides that Agriculture and Forestry have made during the last few decades. We think it probable that a fair percentage of such waste lands (in whichever province they exist) can be improved in a vast majority of cases. The extent to which improvement is possible depends naturally on the conditions that obtain in different provinces. In some this waste is the property of the State, in others of private individuals. These lands are subject to various land-revenue systems and no generalization is possible. In this connexion we wish to draw attention to the results obtained in the United Provinces. In the United Provinces, protection from grazing during the rains (June to November) of *Usar* (alkaline lands) has resulted in increasing the crop of hay in spite of grazing having been permitted after the hay harvest. The following are the figures of an actual research experiment

and have been supplied to us by Mr. Smythies (for details reference may be made to the Appendix) :—

Year.	Hay in Maunds per acre.
1931	.. 2.75
1932	.. 3.00
1933	.. 5.00
1934	.. 9.75
1935	.. 9.25
1936	.. 15.00

These figures show an increase of 500 to 700 per cent. in 5½ years.

16. On the poorer quality of soils the Forest Department in the United Provinces have made some thousands of acres of fuel and fodder plantations in Saharanpur and Bahraich division by means of plantations with field crops at practically no cost. With controlled lopping and coppice it is hoped to obtain, according to Mr. Smythies' forecast, 600 tons of green leaf fodder and 1,500 tons of firewood per square mile of plantation per annum. The afforestation of ravine land in Ettawah district is another instance of the possibility of utilizing otherwise unproductive land. Here good management was able to improve the grass crop and stop erosion.

17. There are, we believe, possibilities of extending fodder plantations in co-operation with private owners where the waste land is owned by individuals or communities. The creation of such plantations and fodder reserves should cause a substantial reduction in the quantity of cowdung now used as fuel.

18. While convinced of the possibilities of improving waste lands, we are definitely of opinion that the reclassification of such waste lands (as visualized by the Royal Commission) cannot be left to any single department of a Provincial Government. We recommend in every province the formation of a permanent Standing Fodder and Grazing Committee composed of officers deputed for the purpose by the Forest and Revenue Departments and an Animal Husbandry Officer. This permanent Committee for each province should act as the Provincial Committee of a new Grazing Sub-Committee of the Imperial Council of Agricultural Research, which would then be in a position to co-ordinate the work for the whole of India. The problem is an all-India problem, but the detailed solutions must be provincial.

19. The Provincial Fodder and Grazing Committees should investigate the reclassification of waste land outside Government forests and select areas fit for the production of fodder or for management as grazing grounds and should make proposals for the control and management of such lands. Our recommendations can only apply to waste lands to which the Government right of management is clear and undisputed. We hope however that private owners may, in course of time, be induced to manage their wastes on scientific lines provided that some organization is brought into existence for their assistance.

20. We have considered the question of agency required for the management of areas selected for fodder and grazing purposes and we are of opinion that the Provincial Fodder and Grazing Committees would be best able to advise the Local Government what may be the most suitable agency for this purpose. In addition the Provincial Committees should draw up schemes for research on approved subjects for submission to the Imperial Council of Agricultural Research for grants in aid for these investigations.

21. In brief our conclusions and recommendations therefore are—

(1) That there is great scope for the introduction of proper management in lands which up to the present time have been outside the orbit of the activities of any of the technical departments.

(2) That the organization of such improvements should vest in special Standing Fodder and Grazing Committee to be formed in each province and that their activities should be co-ordinated by a new Fodder and Grazing Sub-Committee of the Imperial Council of Agricultural Research.

Chairman.

C. G. TREVOR, C.I.E., Inspector-General of Forests to the Government of India.

Members.

T. A. WHITEHEAD, I.F.S., Chief Conservator of Forests, Madras.
E. A. SMYTHIES, I.F.S., Conservator of Forests, United Provinces.
C. M. HARLOW, I.F.S., Conservator of Forests, Central Provinces.
E. A. GARLAND, I.F.S., Deputy Conservator of Forests, Bombay.
N. P. MOHAN, I.F.S., Deputy Conservator of Forests, the Punjab.
W. S. READ, Punjab Veterinary Service.
R. D. PAUL, Madras Civil Service.

APPENDIX.

Statistics of Makhdoompur Usar experiment, United Provinces.

1. This experiment (started July 1931 by the Forest Research Branch, United Provinces) of 32½ acres was started to test the possibilities of improving fodder supplies from usar plains (the area of which in the United Provinces is 8,000 square miles, far greater than the total area of Government forest). The control of the experiment is complete, and the data obtained are therefore reliable.

2. The lay-out is as follows :—

All plots and sub-plots.—Complete protection every monsoon June to November.

Plot 1-1—Grass cut every year in November, and then open to unrestricted grazing for six months.

Plot 1-2—Grass cut every year in November, and then protected from grazing.

Plots 2-1 and 2-2—One and a half years' complete rest. Thereafter treated as sub-plots 1-1 and 1-2 respectively.

Plot 4—Five and a half years' complete rest. Grass cut for first time in November 1936.

All figures in maunds of hay per acre.

Year.	Sub-plot. 1-1.	Sub-plot. 1-2.	Sub-plot. 2-1.	Sub-plot. 2-2.	Plot. 4.	Remarks.
1931 ..	2·75	2·75	nil.	nil.	nil.	1. All hay is cut and dried for 10 day and then weighed in November each year. 2. The monsoon of 1932, 1933 and 1935 were poor. The monsoon of 1936 was very strong.
1932 ..	3·0	4·75	5·75	4·5	nil.	
1933 ..	5·0	9·25	5·5	9·0	nil.	
1934 ..	9·75	12·0	8·25	10·0	nil.	
1935 ..	9·25	11·75	8·0	10·5	nil.	
1936 ..	15·0	20·0	15·5	17·0	18·0	
Total to date	44·75	60·5	42·0	51·0	18·0	
936 green grass	18·0	28·0	18·0	22·0	23·0	

3. The tentative conclusions which the above figures indicate are—

(*i*) That protection from grazing during the rains has a ***remarkable progressive effect*** on increasing grass production (all sub-plots).

(*ii*) That opening to grazing (after hay-making) for six months each year does not check the increasing grass production, but slows it down (*cf.* sub-plots 1-1 and 2-1 with 1-2 and 2-2). (It should be realized however that cattle have removed a certain amount of stubble after hay-making in sub-plots 1-1 and 2-1.)

(*iii*) That continued complete closure both to grass-cutting and grazing serves no purpose, and results in a waste of annual yield (*cf.* six-year total of plot 4 with other plots).

(*iv*) That total monsoon rainfall is an important factor, good rains meaning good hay crop. (This was well-known years ago in the Afforestation division.)

Taking 2.75 maunds per acre as the initial yield of hay after one monsoon protection, the increase per acre per annum after 5½ years has been 600 to 700 per cent. in the sub-plots protected from grazing (1-2, 2-2 and 4) and over 500 per cent. in the sub-plots (1-1 and 2-1) with six months' grazing allowed (but the good monsoon of 1936 may possibly have swelled this remarkable result unduly). The experiment is continuing, and the Research Branch will publish results in due course.

SUBJECT No. 3.

The need for increased technical personnel required for livestock improvement work through India.

Note by Imperial Council of Agricultural Research.

"India having acquired so large a cattle population and the size of the animals in many tracts having fallen so low, the task of reversing the process of deterioration and of improving the livestock of the country is now a gigantic one; but on improvement in its cattle depends to a degree that is little understood the prosperity of its agriculture and the task must be faced. Unless substantial changes in the existing management of cattle are introduced, a progressive deterioration in the quality of the cattle is to be feared."

The above quotation from the report of the Royal Commission on Agriculture, 1927, is taken as the text of this note, for it sums up so admirably the position of cattle in India as it was in 1927, and as it still largely is at the present time, in spite of much effort that has been expended on the subject in the last 10 years.

The stimulus that has recently been given to cattle breeding has brought the importance of this subject vividly before the public, but there is still a long way to go before it will be possible to say that the management of cattle and livestock in the villages of this country has reached the stage when their further deterioration has been arrested: much less that their improvement on a large scale has been commenced.

To carry out this rather ambitious programme, which, as the Royal Commission quite rightly says, is a task that must be faced, it is desirable that Governments themselves should take the lead and provide an organisation composed of suitably trained personnel, who will investigate the fundamental aspects of the subject at research Institutes and experimental farms in the first place and later carry their results into the villages where they can be given practical effect.

The first part of this programme has now been to a great extent provided. The Government of India have recently re-organised the Imperial Veterinary Research Institute, Muktesar, which deals with the pathological problems arising in the livestock industry, including the question of the control of contagious diseases, an enlarged Animal Nutrition Institute for the investigation of fundamental problems connected with the feeding of livestock is in process of being built, and an enquiry has recently been made into the requirements of the Dairy industry, and financial provision has already been made for an expansion of the activities of the Central Dairy Institute.

In the provinces investigational work on fodder is being undertaken at several centres, and in all provinces and several States, cattle breeding farms are now maintained and the breeding of pedigree stock of practically all our recognised draught and milch breeds is carried on with a view to providing approved animals to those who require them for stud purposes.

The personnel required for such research Institutes and laboratories as those referred to above is comparatively easy to obtain, for the duties of each post fall within fairly narrow limits and the actual number to be filled is not large, but the staffing of cattle farms requires rather more consideration, for here aptitude for the work and technical training have both to be considered. In this connection attention may be drawn to the recommendation of the Royal Commission on Agriculture on this subject which was "We favour the appointment of Veterinary Officers who display a special bent or aptitude for stock improvement to posts at livestock farms. We think it likely that graduates of Indian Veterinary Colleges would often prove useful recruits to the staff of such farms".

The curriculum of provincial Veterinary Colleges has been under review on several occasions recently, and recommendations have been made by the Imperial Council of Agricultural Research which, if adopted, should ensure that the Veterinary Assistant Surgeon of the future is even more useful in livestock improvement work than he was when the Royal Commission made the above remarks. In addition, the Government of India are considering a scheme which has been put forward for the training in this country of higher grade Verterinary graduates, whose curriculum will include all those subjects required by the complete animal husbandman.

It is when we turn to the question of technical personnel for extension work in the villages that most difficulties arise, for here the field, in regard to both the quantity and quality of the work to be performed, is almost unlimited and in these days of financial stress it is obviously not practicable to suggest for this work the introductioin of a large body of highly paid men trained solely in livestock improvement work.

This question has, however, been under the consideration of several different bodies during the past few years and some definite recommendations have been made, but before enumerating these, it will be advisable to draw attention to the note, which is appended below, by Colonel Olver, Animal Husbandry Expert of the Council, which gives a comprehensive survey of the whole question of livestock improvement and shows very clearly what must be done in India if cattle management is to reach the high standard we desire and the people of the country are to obtain the maximum amount of benefit obtainable from their livestock.

This note emphasises in particular the necessity for the employment of officers at the head of affairs, who are experts in the subject and devoted to the requirements of the livestock industry in this country, and the recommendation of the Royal Commission on Agriculture on this point may also be quoted. They say "In view of the great importance of the (livestock improvement) work we are of opinion that at least one whole-time officer should be employed on it in each province. Where the improvement of several distinct types of cattle is

being attempted, carefully trained experts should be placed in charge of each section of the work".

The second part of the recommendation is of particular interest at the present time, when so much attention is being paid to the question of improving the milk supply of the country, and, no doubt, some provinces will consider the advisability of making special provision for this part of the subject.

One more point on which emphasis may be laid is the necessity, when selecting livestock officers, to remember that any amount of technical training will not necessarily make a man a good judge of animals. What is required in these officers, in common parlance, is a good "eye" for an animal and this is usually born in a man or it may be developed as a result of constant association with animals from youth upwards.

The staff which these livestock officers are to be given for extension of controlled breeding work in the villages is a matter of great importance and on the adequacy of this largely rests the success of the operations. In some provinces the executive staff of the Agriculture Department and in others of the Veterinary Department is used for livestock improvement work, but it is to be feared that in at least some cases this is looked on somewhat as a sideline and is apt to be over-shadowed by other duties. Obviously, as a matter of economy, as much use as possible should be made of suitable existing staffs, but the employment of the subordinate staff of the Veterinary Department on this type of work will be greatly hampered in some provinces while the existing arrangement, under which many of the staff are lent as whole-time servants to local bodies, remains.

In local agricultural, veterinary and forest colleges, much might be done to give the training imparted to the students a bias in the direction of livestock improvement, which should provide each province with a number of scientifically trained men interested in the extension of the work, who would make useful assistants to the livestock officers in those provinces in which the routine staff of the department in charge of livestock improvement requires more expert assistance, either for ordinary supervising duties or for particular types of work.

To turn to some specific recommendations, the Advisory Board of the Imperial Council of Agricultural Research, when considering the cattle improvement scheme initiated by His Excellency the Viceroy, recommended that for every 50 approved bulls at stud one suitably qulified inspector and subordinate staff should be provided, and it also recommended that, in order that the scheme may result in lasting benefit to the country, the following items of work should receive particular attention :—

(*a*) The registration of the accredited progeny of approved bulls ;

(*b*) The maintenance of the bulls through a fund to be established in each province ;

(*c*) The formation of cattle breeding Societies, holding of cattle shows and award of sanads ;

(*d*) The castration of all inferior stock ;

(*e*) The permanent protection against Rinderpest of all registered stock free of cost.

Another important recommendation, which, if adopted, will provide a cheap agency for village extension work, was that made by the Animal Husbandry Wing of the Board of Agriculture which met in Madras in December 1936. This meeting has recommended the recruitment from amongst the ryot classes of youths interested in livestock and after a short period of training to be employed

as Stockmen on a suggested pay of Rs. 25—½—35 per mensem, on the following duties :—

(1) Dressing and compounding,

(2) Castration,

(3) Treatment of simple and minor ailments,

(4) Rendering assistance in vaccination and inoculation work,

(5) Registration of accredited stock, including tattooing and branding of animals,

(6) Collection of specimens and demonstrations in field work connected with special investigations,

(7) Work in connection with dipping operations,

(8) Propaganda work in connection with general sanitary conditions, flaying of carcasses, etc.,

(9) Generally to advise village folk on the care and management of animals.

If the last item is taken to include some instruction in the better feeding of cattle and the production of clean milk, such a body of men should do much, at a comparatively low cost, to augment the efforts of the more highly trained personnel, which has been discussed above, to produce the improvement desired in the livestock industry of the country.

Livestock improvement in India by Colonel A. Olver, C.B., C.M.G., F.R.C.V.S., Animal Husbandry Expert, Imperial Council of Agricultural Research.

Since His Excellency the Marquis of Linlithgow became Viceroy of India, there has been a great awakening of interest in the improvement of livestock and of cattle in particular. The matter has been repeatedly discussed with provincial representatives, and this note is intended to put together in comprehensive form recommendations and conclusions as to the lines along which it seems that the development of livestock and livestock industry should proceed in India.

General Conditions.—From the discussions which have taken place it is evidently agreed that as far as cattle are concerned, the only sound policy for the plains of India is to improve the best indigenous breeds, by systematic selection and proper feeding and management, since European breeds have proved generally unable, even under the best conditions, to maintain themselves satisfactorily within the tropics. This general principle has been found to apply in the case of milch goats also, but in the case of poultry imported European breeds thrive well and seem on the whole to be less susceptible to disease than the ordinary village fowl. In the case of sheep, it has generally been found difficult to maintain European breeds in the plains, though some success has been obtained in establishing cross bred merino sheep for the production of better wool. In horses, the improvement effected by imported stock has been very great, though the expense of rearing high grade stock is generally beyond the means of the ordinary breeder. In the case of donkeys, the imported jack has done much to improve village stock.

Improvement of Cattle.—It is now abundantly clear that the efforts which were made in the past to improve cattle by breeding limited numbers on provincial farms has, in most provinces, had little lasting effect on the bulk of the relatively enormous numbers to be dealt with. The reasons for this are not difficult to understand for it is obvious that the numbers of suitable sires which could be produced, on ordinary Government farms of limited extent, could never

be sufficient directly to affect more than an almost infinitesimal proportion of the huge numbers which exist. Moreover, fatal changes of policy, or change of control or for financial or other reasons, have intervened to dash any hope of achieving the extensive results which might have been obtained by skilful handling, on a definite programme, of such limited numbers of sires as were generally available.

On the other hand, in provinces where systematic measures for the improvement of livestock have been carried on generation after generation by animal husbandry organisations, such as the Veterinary Department of the Punjab, and to a limited extent the livestock sections of certain provinces and States, steady improvement has been effected corresponding with the extent to which the Department concerned has been expert in animal husbandry work and devoted to the care and development of livestock.

Furthermore, where due attention has been paid to purity of blood the improvement has been maintained and an interest in pedigree stock aroused, which augurs well for the future; provided that adequate measures are taken to maintain proper pedigree registration.

In view, however, of the steady reduction which is taking place in grazing areas, and the circumstances in which breeding is generally carried on in India, it seems clear that degeneration of stock is likely to continue unless more adequate steps are taken and a larger proportion of funds are allotted for their better care and development. At present, for the whole of India, including the Punjab, the total allotment for Animal husbandry, including Veterinary work of all kinds, is only about half of the total allotted for plant husbandry, and it seems clear that the first essential for the systematic improvement of livestock in India is an adequate Animal husbandry organisation, in each province or State, with no other interests to consider than the welfare and economic exploitation of stock, and with a more adequate share of the total amount of money allocated for the development of agriculture as a whole. Indeed it does not seem reasonable to expect adequate or lasting results in the improvement of livestock or in the profitable development of Animal industry unless and until such organisations are everywhere available.

The constitution and control of such organisations, and the powers and funds to be placed at their disposal, are thus matters of vital importance which need to be very carefully considered by provinces and States. It is not merely a question of veterinary or agricultural control, but it seems obvious that to develop livestock properly such departments should be under the control of suitably trained specialists in such work, devoted solely to the interests of livestock.

Selection of Breed and Type.—Given a suitable Animal husbandry department, the first thing to be done is to consider what kind of stock is to be raised, and it is essential at the outset to arrive at sound decisions as to the particular breeds and types which are likely to suit the circumstances and localities in which breeding is to be carried on. At the risk of stating the obvious, it must be pointed out that nowhere in the world is it sound policy to attempt to produce a type of stock which is not naturally suited to the local conditions of soil, climate and environment. That high class stock can be produced in areas which are not naturally suitable for them, there is no question, but the cost of doing so is prohibitive for the ordinary breeder and, apart from the constant struggle against adverse circumstances which would be entailed, there is the difficulty that—if of a breed or type different from the local stock—the male progeny, when used as sires, would be likely to do more harm than good. Moreover, in order to obtain fresh blood and to maintain type in the parent herd, it would be necessary constantly to import sires from elsewhere.

Type.—The decision as to the particular type to be bred, *e.g.*, working type or milch type, is another matter which requires very careful consideration since, in all breeding work, strict breeding to a type and unbroken continuity of policy, are all-important. In this connection, the question whether it is feasible to produce cattle which will breed true for a combination—in high degree—of working capacity, with a capacity for milk production, is one of the matters which has to be considered. This question has already been discussed at length in my note. "The Inadequacy of Dual Purpose Cattle as the Goal in Cattle Breeding in India", the point of which appears to have been missed by many. In that note it was not intended to deny that it is possible for an expert breeder to achieve duality of purpose—up to a certain point—provided that he is at liberty to select freely and to discard animals which do not show the desired combination of factors. But it seems obvious that the Indian peasant, who is not in any way an expert breeder of pedigree stock, and who maintains usually not more than one or two cows in a village herd, to meet his own requirements, cannot hope to be in this position. He is not permitted by his religion to slaughter cattle and can only hope at best to be able to mate his cow with a sire of the type he wishes to emphasize in the progeny. If he wants more milk, he would like to be able to mate his cow to a milking-type bull. and would have a much better chance of getting a high yielding heifer than if only dual purpose sires were available. If he requires more powerful work cattle, he would naturally prefer a sire of a pure working type. Ordinary commercial stock are commonly bred on these lines even in advanced countries. but it is a truism that to make and maintain progress, the breeder of pedigree stock must specialise all the time on one particular type.

For dairying in particular it is necessary to specialise, since if the milk producer is to have a fair chance of making a financial success of his business, he must have high grade milch cattle, and for that reason, in areas where dairy stock are largely bred, it is essential to develop high milking strains. Where the sale of bullocks is the traditional policy, breeding specially for work is likely still to be carried on by semi-nomadic professional breeders so long as suitable grazing remains available at low cost.

Between these extremes lie the great majority of cultivators who keep one or two cows and produce less specialised "general utility" stock which, though useful for their requirements cannot, in view of their heterogeneous origin, be relied upon to breed true and therefore cannot be described as "dual purpose" stock in its strict sense. To develop and maintain Indian village cattle as true breeding dual purpose stock would moreover be a collossal undertaking.

Furthermore, though much is said of the breeding of dual purpose cattle in this country, the method usually adopted appears to be to pay strict attention to milk recording and to retain the best milking strains until such time as definite signs of unsuitability for draught purposes appear in the progeny. When that time comes the breeder will be faced with a decision whether to retain any high yielding milk strains thus evolved, or to destroy the advance thus achieved by crossing back to a working type bull. What the answer must be in the interest of progress is not difficult to foresee and in the meantime, more milk is being bred into the stock. Along these lines so long as promising dairy strains are not crossed back to a work type bull there need be no objection to so-called dual purpose breeding but high capacity for work and for milk production are physiologically incompatible, and instances are not wanting in India where attempts to retain these factors, in equal degree, in one and the same strain, have led to marked deterioration of previously valuable stock. For beyond a certain point any marked advance in either direction must be cancelled out and the work must to that extent become Sisyphean while any progress towards fixation of a type which should breed true for either factor in high degree, must constantly be vitiated.

Even the combination of milking capacity with meat production, qualities which are not so incompatiable as are capacity for work and milk production, has been given up in other countries, and it seems certain that a similar policy must eventually fail in India since it will not produce that definite segregation of types which has been found essential in every progressive country in the world.

The choice as to which type of bull to use must however largely be influenced by local consideration and the aim of governments should be to provide the type most needed in the locality or, where possible and advisable, to make milking type as well as working type bulls available. Where the supply of liquid milk is a profitable undertaking and where there are good facilities for the production of fodder crops, the choice would obviously fall on the dairy type, but the ordinary cultivator should as far as possible be in a position to choose the type of sire he considers the most suitable for his particular cows and for his requirements.

Cow or She Buffalo.—Similarly, a choice has to be made as to whether cows or she buffaloes are to be maintained. Here again these is some diversity of opinion and the choice is likely ultimately to be governed by financial considerations ; though there is another aspect to be considered. Where abundance of coarse fodder is available, and where the production of ghee is a major consideration, or where liquid milk is produced for sale—usually by unscrupulous and uncontrolled hawkers—the she buffalo is at present commonly preferred. But investigation has shown that pure-bred cows of certain Indian breeds of cattle can, in a comparatively few years, be improved by proper feeding and management to a point where they can compete successfully with the buffalo in economy of milk or butter-fat production. In view therefore of the greater general utility of cows, as compared with buffaloes, in that they produce better working animals as well as milk, and of the important fact that cows' milk is a much better food, particularly for children, than buffaloes' milk watered down to the same level of butter fat, the question whether cows should not be bred and as well fed and maintained as are she-buffaloes is one which merits careful study.

The Breeding of Working-Type Cattle.—In areas where the demand for milk and dairy products is limited and where facilities exist for raising cattle on extensive grazing, the breeding of working-type animals is the traditional policy and seems likely to continue because it is difficult to carry on dairying under the semi-nomadic conditions of life of such breeders. But it is perhaps not sufficiently known that even among breeders of workng bullocks a great deal of their total income is derived from the sale of ghee ; *e.g.*, we have recently been shown, by representatives of large numbers of professional cattle dealers and breeders in Western India, some of whom themselves breed and rear large numbers of working bullocks, that the income derived from their sale is not much more than one-fourth of that derived from the sale of ghee and other dairy products. The position is somewhat similar in other parts of India and owing to the growing realisation of the essential importance of milk in human diet, it seems likely that the market for liquid milk will improve, while already in certain large areas, milk collection for ghee or cream production is being organised on a big scale through the use of small cream separators. Thus, milk seems likely to become more and more an important consideration for the breeder of work cattle.

Capabilities of Indigenous Breeds as milch cattle.—A careful analysis of available records has shown that in different parts of India there are breeds, of pure Indian cattle, which respond readily to proper treatment and which possess considerable potentialities for milk production. But to ensure rapid progress it is obvious that milking strains must systematically be segregated out from the ordinary cattle of the country and mated with bulls, of known pedigree, from cows of high milk yields. In this way, in course of time, definite milking type Indian cattle should become available which could be [illegible]

upon to breed true for milk and in view of the great need for such cattle, the Imperial Council of Agricultural Research is now engaged in instituting official herd books for seven of the best known milch breeds of India.

Cross-bred Indo-European Cattle.—For years past it has been demonstrated by organisations such as the Military Dairy Farms that cross-bred cattle from Indian cows by sires of European blood, in spite of the heavy capital and recurring expenditure involved, are generally under their special conditions of management, more profitable dairy animals than ordinary Indian cows. On the other hand, there is ample evidence to show that where control is inadequate or inexpert, the pursuit of such a policy leads to immediate loss of type, rapid degeneration and high susceptibility to disease.

But a policy of cross-breeding with European cattle is not in any case within the reach of the ordinary Indian milk producer, who is not at liberty to discard freely animals which do not reach the required standard. Moreover, since a long time is required to see the results of a policy and there is a natural tendency of individual breeders to repeat breeding experiments—in spite of previous failures of which they may not be aware—it is necessary to emphasise as strongly as possible that systematic improvement of the best indigenous breeds of Indian cattle is the only practicable policy for the generality of the people.

Breeding under Government control.—It seems generally agreed also that in India it is essential to make provision for organised breeding control in the villages, and that in all breeding under Government control a definite long range policy for improving local breeds should be laid down and suitable provision made to ensure that it shall not be changed, except after full consideration of all the issues involved.

Such a matter, in which irreparable harm may easily be done, should not in short be left to the personal predilection of a director who, in present circumstances, may not be a specialist in any branch of animal husbandry or devoted solely to the interests of livestock. Moreover, seeing that it is an impossibility to produce on Government farms the very large numbers of pedigree bulls which are required for mass improvement of cattle, it seems that the ordinary provincial cattle farm of limited extent should as a rule be utilised primarily for preserving outstanding strains of the best indigenous breeds and for the systematic development and recording of pedigree milch animals rather than in attempting to produce dual purpose stock.

It is agreed that for the improvement of the generality of stock of a province or state reliance must be placed upon systematic breeding control in the villages, at first concentrated in areas where the best cattle exist, and later extended, as circumstances permit, into less forward areas. As time goes on and a type becomes established, good animals from selected stock should be registered as pure-bred, while all inferior males should be castrated and the services of approved bulls recorded. In the case of dairy cattle, strict recording of milk yields is necessary wherever possible in order that, in course of time, breeders wishing to purchase high-grade dairy stock may be able to obtain reasonably accurate data as to the performance of their ancestors. Indeed, the lack of bulls of known pedigree has been one of the greatest difficulties encountered in carrying out the campaign of livestock improvement instituted by the present Viceroy.

Inoculation and Castration.—Simultaneously with and complementary to selected breeding along the above lines it is essential to make arrangements for protective inoculation against contagious disease ; while the systematic castration of inferior males, before they can perpetuate the species, is obviously one of the most potent factors in any programme of livestock improvement. It is in fact now generally recommended that provincial or state legislation should be undertaken for compulsory castration in selected areas.

At the second meeting of the Animal Husbandry Wing of the Board of Agriculture, held in December 1936, this matter was discussed and it was decided to recommend that such legislation should be of a permissive nature and confined at first to small selective areas which could gradually be extended. But it was felt that the greatest tact would in any case be needed in the administration of such an act.

Grazing control and Fodder Production and Conservation.—In present circumstances the main factor in the production of moderate priced work cattle is the availability of suitable grazing, since fodder crops are seldom specially grown for such stock. Experience has, however, shown that to rear and maintain the more valuable grades of stock, whether for work or milk production, it is necessary to make provision for an adequate supply of fodder crops or other highly nutritious cattle food ; depending on whether the young stock are sold at an early age, to be reared by cultivators under semi-stall-fed conditions, or are reared by the dealer with his nomadic herd. In either case it is necessary that some succulent food of suitable composition shall be available throughout the year, particularly for young stock, but also for breeding females.

The best means of providing such a diet is a matter for local study, but when the revenue obtainable from forests is compared with that from high grade stock, reared at least partly on cultivated fodder or semi-fodder crops, specially grown to supplement or replace the available grazing, it seems clear that it will pay provincial and state governments to give every facility for the production of such crops in areas which are at present under forest of low value.

To deal with this question adequately it seems essential that special committees should be formed as soon as possible on the lines which were recommended by the Animal Husbandry Wing of the Board of Agriculture at its second meeting, held in Madras in December 1936, after discussing the Report of the Special Forest Grazing Committee, which met during the previous week.

Such Committee should obviously be thoroughly representative of all livestock interests as well as the interests of forestry and crop production, and if on a permanent basis should be able to develop a co-ordinated long range policy in such matters as the control of forest and other grazing ; the devotion of more land to fodder and semi-crop production ; the conservation of grass and other fodder as hay or silage, and to advise as to possible measures to restrict the numbers of uneconomic cattle which at present overcrowd the available grazing, and are an ever-present source of infection.

Disease Control, Feeding and Management.—It must never be overlooked that correct feeding and proper management are most important in securing lasting improvement of stock. But it is now very clear from the work of veterinary investigation officers that expert investigation will constantly be needed of the myriad problems of disease, ill-health and unsatisfactory development due to faulty nutrition ; the proper study of which entails continual veterinary and animal nutrition investigation and research carried out in collaboration.

At present breeders suffer even more from insidious loss due to parasites or nutritional deficiencies than from outbreaks of the major plagues of stock, for some of the most important of which improved and cheap methods of control have recently become available. It seems clear, therefore, that in a country like India where a stamping out policy is impracticable and there is constant danger of infection, adequate staff should be provided for the continuous field investigation of such problems all over the country, in collaboration with veterinary and animal nutrition research workers. This would be in addition to the ordinary provincial veterinary staff which is required for the prompt control of epizootics and the treatment of sick cattle as well as for routine work such as systematic preventive inoculation and castration and the inspection of markets, fairs, abattoirs and dairies.

Marketing.—Marketing is another general factor which has immense potentialities in the improvement of livestock.

Indeed, it is obvious that unless and until satisfactory markets are provided, for improved livestock and livestock products, few stock-owners can afford to spend money on the improvement of stock. On the other hand, there is ample evidence that the establishment of a satisfactory market, *e.g.*, for milk or eggs, in any locality, immediately gives a great impetus to the better care and development of the class or stock concerned.

More detailed conclusions of certain Livestock Committees which have been formed from time to time to consider measures for the improvement of livestock are given in the Appendix.

General Conclusions.—Thus it seems clear that more adequate provision is necessary, in most provinces and States, for the systematic development of Livestock and Animal Industry.

Moreover, it is generally agreed by all authorities on human diet that a more adequate and better supply of milk is an outstanding need of India today—better not only as regards cleanliness, but also in its content of protein and mineral salts which are now recognised to be of first rate dietetic importance; particularly for growing children and in a diet which is otherwise mainly vegetarian.

It has in fact recently been shown, by practical feeding tests in India and in all progressive countries, that nothing can replace the protein, of high biological value, and the mineral salts which are contained in undiluted milk.

To ensure a better supply of milk it is necessary however (1) to provide for proper control of the marketing of this vital commodity—which at present is usually sold by insanitary, unscrupulous and inadequately controlled hawkers—, (2) to produce better milch animals, (3) to furnish better facilities to enable the milk required for cities to be produced in suitable areas outside city limits, and brought in for sale under satisfactory sanitary conditions, and (4) to make better provision for milk produced in the villages throughout the country, to be collected at suitable centres, and, after suitable processing, to be marketed as such or in the form of Ghee-cream, (5) to make use of skimmed milk to the fullest possible extent, in human diet and particularly in the feeding of growing children, since in it is contained the whole of the most valuable dietetic constituents of milk, *viz.*, the body-building proteins and mineral salts.

At present, in many parts of India, the she-buffalo is for a variety of reasons preferred to the cow as a milch animal, but it would not be practicable in any event to provide from buffaloes alone, the greatly increased supply of milk which is needed. Moreover, there are points of considerable dietetic importance in this connection which should not be overlooked, *viz.*, owing to its very high though variable butter fat content, undiluted buffaloes milk is not usually suitable for human consumption. To make it suitable it needs to have 50 per cent. or more of the cream removed and, since undiluted cows and buffaloes milk have about the same percentage of protein and mineral salts, if both are watered down to a suitable level of butter fat (say 3.5 per cent.), buffaloes milk becomes of much less feeding value, particularly for growing children, because the protein and salts thereby become much more heavily diluted.

Thus, while nothing must be done to interfere with the production of useful work cattle, it appears that the production of more and better milch cattle is a matter of great importance and urgency for the welfare of the people of India.

But to make satisfactory progress and provide really efficient milkers, it will be necessary to concentrate on high milk production in particular strains regardless of what the effect may eventually be on the capacity for work of the bullocks bred from these particular strains.

The existing supply of working type cattle should in fact be more than ample if young stock and breeding females were better fed, but there is a great shortage of efficient milch cows all over India. On the other hand, it is now well known that there are pure Indian breeds of cattle which have good latent capacity for milk production and which respond readily and markedly to better feeding and management—much more so than buffaloes.

It seems clear, therefore, that the systematic development of high yielding milch strains of suitable Indian breeds of cattle, as well as of buffaloes for ghee production, is a matter of great urgency and importance to India.

Owing to the high biological value of eggs in human diet, the development of poultry by systematic encouragement of pedigree breeding of selected European breeds, as another matter of great dietetic and economic importance to which far more attention needs to be given as a cottage industry.

APPENDIX

The question of livestock improvement, with special reference to the pedigree bull scheme initiated by H. E. the Viceroy, was discussed in detail first by the Standing Cattle Breeding Committee of the Advisory Board of the Imperial Council of Agricultural Research held at Simla in July 1936 and then by the Livestock Improvement Committee of the Second Animal Husbandry Wing meeting of the Board of Agriculture and Animal Husbandry, held at Madras in December 1936. The following are the conclusions and recommendations arrived at by these committees :—

1. In order to effect cattle improvement on a broad scale it is necessary primarily to extend controlled breeding in areas where definite types exist and that subsequently as large numbers as possible of selected bulls from these areas should be employed in areas where at present there is no definite type.

2. Where the cattle of an area are sufficiently pure the recording of approved stock in official herd-books should be taken up provincially. Such recording would be quite distinct from the official registration of pedigree stock of dairy breeds of all-India importance which is now being taken up by the Imperial Council of Agricultural Research.

3. In order to ensure a continuous supply of pedigree or approved bulls it is necessary to establish pedigree breeding in selected areas.

4. In order to carry on continuous improvement it is necessary to record accurately the services of all approved bulls and to register their accredited progeny. For this purpose it is necessary to employ extra staff at the rate of one suitably qualified inspector and subordinate staff per 50 bulls.

5. It is not possible at present to carry out strict registration of pedigree stock under village conditions of breeding, nor to undertake milk recording in villages without special staff.

6. It is felt that a great deal of good could be done if the herds maintained in jails, mental hospitals, etc., at Government expense, and at Panjrapoles were more extensively utilised for the breeding of pedigree stock, and at such institutions strict milk recording should be feasible. It was also suggested that improvement might be given to the Military Dairy Farms to rear the best of their young mate stock of indigenous breeds and to suit their breeding policy as far as practicable to the accepted policy of the country, i.e., the improvement of indigenous breeds. It was also suggested that small herds of pure-bred indigenous dairy cattle should be maintained at Government Seed and Demonstration Farms.

7. For the maintenance of bulls it is necessary to establish funds the proceeds of which should be spent partly for the purpose of bulls and partly for their maintenance.

8. Wherever bulls are provided by Provincial or District Cattle Breeding Associations it is essential that provision be made from the same source for their maintenance. Otherwise it may not be possible to accept them.

9. Arrangements should be made for the castration of inferior stock in areas where approved bulls are at work. In regard to compulsory castration it was decided that an enabling Act would be an advantage in most provinces and States, but that it would be very necessary to exercise tact in its application. It could only be applied where the great majority of breeders were agreeable and where arrangements could be made to supply an adequate number of suitable bulls to serve the cows in the area concerned.

10. Interest of the ryot in cattle improvement should be aroused by such measures as periodical cattle shows and the award of prizes and *sanads* to those who had taken special interest in cattle breeding. Provincial or State Cattle Breeding Societies would also help to arouse interest in cattle improvement but it was considered that such societies need be formed only where satisfactory breeding control does not already exist.

11. In order to encourage people to take interest in pedigree stock it is advisable to give permanent protection against Rinderpest to all registered stock free of cost.

12. For the present, services of approved bulls should, as a rule, be given free of cost, but in certain provinces the system of charging fees should be developed.

SUBJECT No. 4.

The possibility of crop planning for increased fodder production with special reference to leguminous fodders.

Note by Imperial Council of Agricultural Research.

It is well known that over the greater part of India cattle are maintained mainly on fodders produced in the villages and not on grass, which under present conditions of management is available for only a short season of the year. Crop residues, mainly the straws of cereal crops, provide the greater part of the bulky fodder consumed by this large cattle population. The direct bearing of this question on crop planning will be obvious from the fact that of the total cropped area of some 260 million acres in British India, 201 million acres are occupied by food grains and pulses—practically all crops the straw of which is used for bulky fodder. On the other hand the total area in India under special fodder crops, so far as the records go, is only about 3 or 4 million acres.

As all those acquainted with the crop production in the villages of India know, the average cultivator is greatly influenced in his cropping schemes by the necessity for providing fodder for his cattle, and it is not the purpose of the present note to suggest any disturbance between the general relationship between straw and other crops. It is, however, desired to suggest for consideration a possible means by which the feeding of Indian cattle could be qualitatively improved.

2. During the last quarter of a century, the Agricultural Department has been systematically producing and bringing into general cultivation heavier-yielding varieties of the main staple crops and the areas under the improved varieties of the principal of these are shown in the following table. Speaking broadly, heavy yielding crops are now produced on not less than 2 million acres and the area is automatically increasing in many tracts. Though the recent rise in world prices has ameliorated the position, it is still broadly correct to say that we do not desire any considerable enhancement in the production of

these staple crops at present—indeed in the case of both jute and sugarcane a reduction is called for. Obviously the bringing into cultivation of high-yielding varieties of crops may either increase the total production on the existing acreage or enable the existing production to be obtained from a smaller area, and it is manifest that the latter process is a source of profit to the grower even in times of depressed prices and limited demand. It is suggested that at this juncture we should pay more attention to crop planning from the point of view of improving the standard of agriculture and particularly to the better feeding of our cattle. Better-fed cattle mean a more prosperous cultivator, a better standard of cultivation and a better fed cultivator so that we are working for an all round increase in efficiency. It is therefore suggested that, in those areas where improved high-yielding varieties of crops, which it must be remembered are on the average giving 15 per cent. more per acre than the varieties which they have replaced, each agricultural department should definitely set itself to secure the division to fodder production of part of the area so released. It is not suggested that each cultivator can automatically devote one-fifteenth of his wheat area or one-fifteenth of his cotton area to fodder production. Due regard must be had to the circumstances of each holding and to each cultivator's requirements. But the principle is commended for consideration and there is little doubt that each agricultural department has at its disposal a substantial amount of information regarding fodder crops which might be encouraged in particular districts.

Our object being to raise the general standard of efficiency of village agriculture, it is obvious that the diversion of small areas from the staple crops to fodders will be most effective if leguminous fodders can be utilised. Fortunately we have a wide range of choice. The cold weather fodder crop—berseem (Egyptian Clover)—has been successfully grown without irrigation over large portions of India, and the same is true of that other important fodder crop—lucerne—whilst locally *Senji* (*Melilotus parviflora*) and Shaftal (Persian Clover) have proved successful. Berseem in particular has proved itself a satisfactory crop for 'Soiling' the animals being tethered on the crop, thus saving the expenditure on harvesting and carting. Apart from these there are many indigenous Indian leguminous fodders, which are also grown as pulse crop during the monsoon, which are valued both in India and in other parts of the world as fodders. It is sufficient to mention as examples of these cowpeas, meth, urid, and soya beans. It is suggested that this matter might be given serious consideration. Apart from pulse crops there are many straw crops, as for example, *juar* and maize, which can be satisfactorily converted into silage even though on a comparatively small scale.

There is also a whole range of perennial grasses (Gumeas Grass, Rhodes Grass, Elephant Grass) which can be grown wherever water is available. They can be planted on the sides of nallas, the places where there is leakage or spilling from canals or wells, and beside irrigation channels. They are a perfect means of utilising the flushings of byres. They are specially valuable for dairy and pregnant animals, and are of great use to all stock.

Another opportunity for crop-planning, with the object of making better provision for fodder crops, occurs when the consolidation of holdings is being effected. This is a subject in which very considerable progress has been made in certain provinces, notably the Punjab where the total area consolidated exceeds 63,000 acres. The nett result of the consolidation of holding is almost invariably to increase the total amount of culturable land available in the village. Even after squaring up there must be some small fields and odd corners and where Land Consolidation or Better Farming Societies are at work there would seem to be an outstanding opportunity for encouraging greater fodder production on the small additional areas made available by these operations.

This note only deals with the possibility of better feeding of village cattle without any general change in the present system of agriculture. In many cases

there are probably greater possibilities of economic development by the substitution for the production of crops for sale off the land of the growing of fodder crops for feeding on the holding for the production of milk (and|or *ghee*) for the market. As in this is involved the whole question of the development of the dairy industry of India, on which a special report by Dr. Wright is expected shortly, the matter is only briefly mentioned here.

Area under improved crops in British India during 1935-36.

Province.	Rice.	Cotton.	Wheat.	Jute.	Sugarcane.	Other crops.
Madras	1,063,299	617,942	..	..	58,049	205,055
Bombay	13,524	692,617	25,871	..	13,960	224,830
Bengal	720,126	..	..	1,103,926	277,322	18,047
United Provinces ..	..	397,000	2,637,000	..	2,167,000	543,700
Punjab	..	2,076,100	3,476,800	..	226,300	..
Burma	1,058,784	5,684	24,290	..	16,197	322,233
Bihar and Orissa ..	52,849	..	64,329	1,203	429,832	17,132
Central Provinces ..	585,688	505,327	590,025	..	..	365,544
Assam	42,609	..	..	15,890	14,498	5,889
North-West Frontier Provinces ..	..	900	15,044	..	148	2,657
Sind	27,787	204,290	105,217	..	..	14,522 (1934-35 figures.)
Baluchistan	(NOT available).					
British India	3,546,666	4,499,860	6,938,576	1,121,019	3,203,306	1,819,619

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GOVERNMENT OF INDIA

Finance Department (Central Revenues)

International Opium

AND OTHER

Dangerous Drugs Conventions

1912—1936

REPRINT OF ENGLISH TEXTS

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INTERNATIONAL OPIUM CONVENTION.

Signed at the Hague, January 23, 1912.

INTERNATIONAL OPIUM CONVENTION.

His Majesty the German Emperor, King of Prussia, in the name of the German Empire; the President of the United States of America; His Majesty the Emperor of China; the President of the French Republic; His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India; His Majesty the King of Italy; His Majesty the Emperor of Japan; Her Majesty the Queen of the Netherlands; His Imperial Majesty the Shah of Persia; the President of the Portuguese Republic; His Majesty the Emperor of all the Russias; His Majesty the King of Siam,

Desirous of advancing a step further on the road opened by the International Commission of Shanghai of 1909;

Determined to bring about the gradual suppression of the abuse of opium, morphine, and cocaine, as also of the drugs prepared or derived from these substances, which give rise or might give rise to similar abuses;

Taking into consideration the necessity and the mutual advantage of an international agreement on this point;

Convinced that in this humanitarian endeavour they will meet with the unanimous adherence of all the States concerned;

Have decided to conclude a convention with this object, and have appointed as their plenipotentiaries:

His Majesty the German Emperor, King of Prussia: His Excellency M. Felix von Müller, Privy Councillor, Envoy Extraordinary and Minister Plenipotentiary at The Hague; M. Delbrück, Privy Councillor; Dr. Grünenwald, Councillor of Legation; Dr. Kerp, Privy Councillor, a director in the German Health Department; Dr. Rössler, German Consul at Canton.

The President of the United States of America: Bishop Charles H. Brent; Mr. Hamilton Wright; Mr. H. J. Finger.

His Majesty the Emperor of China: His Excellency Liang Cheng, Envoy Extraordinary and Minister Plenipotentiary at Berlin.

The President of the French Republic: M. Henri Brenier, Advisory Inspector of the Agricultural and Commercial Service of Indo-China; M. Pierre Guesde, Administrator of the Civil Service of Indo-China.

His Majesty the King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Emperor of India: The Right Honourable Sir Cecil Clementi Smith, G.C.M.G., Member of the Privy Council; Sir William Stevenson Meyer, K.C.I.E., Chief Secretary of the Government of Madras; Mr. William Grenfell Max Müller, C.B., M.V.O., Councillor of Embassy; Sir William Job Collins, M.D., Deputy Lieutenant of the County of London.

His Majesty the King of Italy: His Excellency Count J. Sallier de la Tour Duke of Calvello, Envoy Extraordinary and Minister Plenipotentiary at The Hague.

His Majesty the Emperor of Japan: His Excellency M. Aimaro Sato, Envoy Extraordinary and Minister Plenipotentiary at The Hague; Dr. Tomoe Takagi, Engineer to the Government-General of Formosa; Dr. Kotaro Nishizaki, Technical Expert attached to the Laboratory of the Hygienic Department.

Her Majesty the Queen of the Netherlands: M. J. T. Cremer, formerly Minister for the Colonies, President of the Netherlands Society of Commerce; M. C. Th. van Deventer, Member of the First Chamber of the States-General; M. A. A. de Jongh, formerly Inspector-General, head of the Opium Monopoly in the Dutch Indies; M. J. G. Scheurer, Member of the Second Chamber of the States-General; M. W. G. van Wettum, Inspector of the Opium Monopoly in the Dutch Indies.

His Imperial Majesty the Shah of Persia: Mirza Mahmoud Khan, Secretary of the Persian Legation at The Hague.

The President of the Portuguese Republic: His Excellency M. Antonio Maria Bartholomeu Ferreira, Envoy Extraordinary and Minister Pelenipotentiary at The Hague.

His Majesty the Emperor of all the Russias: His Excellency M. Alexander Savinsky, Master of Ceremonies, Councillor of State, Envoy Extraordinary and Minister Plenipotentiary at Stockholm.

His Majesty the King of Siam: His Excellency Phya Akharaj Varadhara, Envoy Extraordinary and Minister Plenipotentiary in London, The Hague, and Brussels; Mr. William J. Archer, C.M.G., Councillor of Legation;

Who, after having deposited their full powers found in good and due form, have agreed as follows:—

Chapter I.—Raw Opium.

Definition.—By "raw opium" is understood:

The spontaneously coagulated juice obtained from the capsules of the *papaver somniferum*, which has only been submitted to the necessary manipulations for packing and transport.

Article 1.

The contracting Powers shall enact effective laws or regulations for the control of the production and distribution of raw opium, unless laws or regulations on the subject are already in existence.

Article 2

Due regard being had to the differences in their commercial conditions, the contracting Powers shall limit the number of towns, ports, or other localities through which the export or import of raw opium shall be permitted.

Article 3.

The contracting Powers shall take measures—

(*a*) To prevent the export of raw opium to countries which shall have prohibited its entry, and

(*b*) To control the export of raw opium to countries which restrict its import,

unless regulations on the subject are already in existence.

Article 4.

The contracting Powers shall make regulations requiring that every package containing raw opium intended for export shall be marked in such a way as to indicate its contents, provided that the consignment exceeds 5 kilog.

Article 5.

The contracting Powers shall not allow the import and export of raw opium except by duly authorised persons.

CHAPTER II.—PREPARED OPIUM.

Definition.—By "prepared opium" is understood:

The product of raw opium, obtained by a series of special operations, especially by dissolving, boiling, roasting, and fermentation, designed to transform it into an extract suitable for consumption.

Prepared opium includes dross and all other residues remaining when opium has been smoked.

Article 6.

The contracting Powers shall take measures for the gradual and effective suppression of the manufacture of, internal trade in, and use of prepared opium, with due regard to the varying circumstances of each country concerned, unless regulations on the subject are already in existence.

Article 7.

The contracting Powers shall prohibit the import and export of prepared opium; those Powers, however, which are not yet ready to prohibit immediately the export of prepared opium shall prohibit it as soon as possible.

Article 8.

The contracting Powers which are not yet ready to prohibit immediately the export of prepared opium—

(*a*) Shall restrict the number of towns, ports, or other localities through which prepared opium may be exported;

(*b*) Shall prohibit the export of prepared opium to countries which now forbid, or which may hereafter forbid, the import thereof;

(*c*) Shall in the meanwhile, prohibit the consignment of prepared opium to a country which desires to restrict its entry, unless the exporter complies with the regulations of the importing country:

(*d*) Shall take measures to ensure that every package exported, containing prepared opium, bears a special mark indicating the nature of its contents;

(*e*) Shall not permit the export of prepared opium except by specially authorised persons.

CHAPTER III.—MEDICINAL OPIUM, MORPHINE, COCAINE, ETC.

Definitions.—By "medicinal opium" is understood:

Raw opium which has been heated to 60° centigrade and contains not less than 10 per cent. of morphine, whether or not it be powdered or granulated or mixed with indifferent materials.

By "morphine" is understood:

The principal alkaloid of opium, having the chemical formula $C_{17} H_{19} NO_3$.

By "cocaine" is understood:

The principal alkaloid of the leaves of *Erythroxyon Coca*, having the formula $C_{17} H_{21} NO_4$.

By "heroine" is understood:

Diacetyl-morphine, having the formula $C_{21} H_{23} NO_5$.

Article 9.

The contracting Powers shall enact pharmacy laws or regulations to confine to medical and legitimate purposes the manufacture, sale, and use of morphine, cocaine, and their respective salts unless laws or regulations on the subject are already in existence. They shall co-operate with one another to prevent the use of these drugs for any other purpose.

Article 10.

The contracting Powers shall use their best endeavours to control, or to cause to be controlled, all persons manufacturing, importing, selling, distributing, and exporting morphine, cocaine, and their respective salts, as well as the buildings in which these persons carry on such industry or trade.

With this object, the contracting Parties shall use their best endeavours to adopt, or cause to be adopted, the following measures, unless regulations on the subject are already in existence:

(*a*) To confine the manufacture of morphine, cocaine, and their respective salts to those establishments and premises alone which have been licensed for the purpose, or to obtain information respecting the establishments and premises in which these drugs are manufactured and to keep a register of them;

(*b*) To require that all persons engaged in the manufacture, import, sale, distribution, or export of morphine, cocaine, and their respective salts shall be furnished with a licence or permit to engage in these operations, or shall make to the competent authorities an official declaration that they are so engaged;

(*c*) To require that such persons shall enter in their books the quantities manufactured, imports, sales and all other distribution, and exports of morphine, cocaine, and their respective salts. This rule shall not necessarily apply to medical prescriptions and to sales by duly authorised chemists.

Article 11.

The contracting Powers shall take measures to prohibit, as regards their internal trade, the delivery of morphine, cocaine, and their respective salts to any unauthorised persons, unless regulations on the subject are already in existence.

Article 12.

Due regard being had to the differences in their conditions, the contracting Powers shall use their best endeavours to restrict to authorised persons the import of morphine, cocaine, and their respective salts.

Article 13.

The contracting Powers shall use their best endeavours to adopt, or cause to be adopted, measures to ensure that morphine, cocaine, and their respective salts shall not be exported from their countries, possessions, colonies, and leased territories to the countries, possessions, colonies, and leased territories of the other contracting Powers except when consigned to persons furnished with the licenses or permits provided for by the laws or regulations of the importing country.

With this object each Government may communicate from time to time to the Governments of the exporting countries lists of the persons to whom licenses or permits for the import of morphine, cocaine, and their respective salts have been granted.

Article 14.

The contracting Powers shall apply the laws and regulations respecting the manufacture, import, sale, or export of morphine, cocaine, and their respective salts—

(*a*) To medicinal opium;

(*b*) To all preparations (official and non-official, including the so-called anti-opium remedies) containing more than 0·2 per cent. of morphine, or more than 0·1 per cent. of cocaine;

(*c*) To heroine, its salts and preparations containing more than 0·1 per cent of heroine;

(*d*) To all new derivatives of morphine, of cocaine, or of their respective salts, and to every other alkaloid of opium, which may be shown by scientific research, generally recognised, to be liable to similar abuse and productive of like ill-effects.

CHAPTER IV.—CONTROL OF DRUG TRAFFIC IN CHINA.

Article 15.

The contracting Powers having treaties with China (Treaty Powers), shall, in conjunction with the Chinese Government, take the necessary measures to prevent the smuggling into Chinese territory, as well as into their Far-Eastern colonies and into the leased territories which they occupy in China of raw and prepared opium, morphine, cocaine, and their

respective salts, as also of the substances referred to in article 14 of the present convention. The Chinese Government shall, on their part, take similar measures for the suppression of the smuggling of opium and of the other substances above referred to from China to the foreign colonies and leased territories.

Article 16.

The Chinese Government shall promulgate pharmacy laws for their subjects regulating the sale and distribution of morphine, cocaine, and their respective salts, and of the substances referred to in article 14 of the present convention, and shall communicate these laws to the Governments having treaties with China, through their diplomatic representatives at Peking. The contracting Powers having treaties with China shall examine these laws and, if, they find them acceptable, shall take the necessary measures to apply them to their nationals residing in China.

Article 17.

The contracting Powers having treaties with China shall undertake to adopt the necessary measures to restrict and control the habit of smoking opium in their leased territories, settlements, and concessions in China, to suppress, *pari passu* with the Chinese Government, the opium dens or similar establishments which may still exist there, and to prohibit the use of opium in places of entertainment and brothels.

Article 18.

The contracting Powers having treaties with China shall take effective measures for the gradual reduction, *pari passu* with the effective measures which the Chinese Government shall take with the same object, of the number of shops in which raw and prepared opium is sold, which may still exist in their leased territories, settlements, and concessions in China. They shall adopt effective measures for the restriction and control of the retail trade in opium in the least territories settlements, and concessions, unless regulations on the subject are already in existence.

Article 19.

The contracting Powers having post offices in China shall adopt effective measures to prohibit the illegal import into China in the form of postal packages, as well as the illegal transmission through these offices from one place in China to another, of opium (raw or prepared), morphine, cocaine, and their respective salts, and of the other substances referred to in article 14 of the present convention.

CHAPTER V.—LAWS AND REGULATIONS.

Article 20.

The contracting Powers shall examine the possibility of enacting laws or regulations making it a penal offence to be in illegal possession of raw opium, prepared opium, morphine, cocaine, and their respective salts, unless laws or regulations on the subject are already in existence.

Article 21.

The contracting Powers shall communicate to one another, through the Ministry of Foreign Affairs of the Netherlands—

(*a*) The texts of the existing laws and administrative regulations respecting the matters referred to in the present convention, or promulgated in virtue of the clauses thereof;

(*b*) Statistical information as regards the trade in raw opium, prepared opium, morphine, cocaine, and their respective salts, as well as in the other drugs or their salts or preparations referred to in the present convention.

These statistics shall be furnished with as many details and within a period as short as may be considered possible.

CHAPTER VI.—FINAL PROVISIONS

Article 22.

Any Power not represented at the conference shall be allowed to sign the present convention.

With this object the Government of the Netherlands will immediately after the signature of the convention by the Plenipotentiaries of the Powers which have taken part in the conference, invite all the Powers of Europe and America not represented at the conference, that is to say:

The Argentine Republic, Austria-Hungary, Belgium, Bolivia, Brazil, Bulgaria, Chile, Columbia, Costa Rica, Republic of Cuba, Denmark, the Dominican Republic, the Republic of Ecuador, Spain, Greece, Guatemala, the Republic of Haiti, Honduras, Luxemburg, Mexico, Montenegro, Nicaragua, Norway, Panamá, Paraguay, Peru, Roumania, Salvador, Servia, Sweden, Switzerland, Turkey, Uruguay, the United States of Venezuela, to appoint a delegate, furnished with the necessary full powers, to sign the convention at The Hague.

These signatures shall be affixed to the convention by means of a "Protocol of signature by Powers not represented at the conference," to be added after the signatures of the Powers represented, the date of each signature being mentioned.

The Government of the Netherlands will, every month, notify the signatory Powers of each supplementary signature.

Article 23.

After all the Powers, as well on their own behalf as on behalf of their possessions, colonies, protectorates, and leased territories, have signed the convention or the supplementary protocol above referred to, the Government of the Netherlands will invite all the Powers to ratify the convention with this protocol.

In the event of the signature of all the Powers invited not having been obtained on the date of the 31st December, 1912, the Government of the Netherlands will immediately invite the Powers who have signed by that date to appoint delegates to examine at the Hague the possibility of depositing their ratifications notwithstanding.

The ratification shall take place within as short a period as possible and shall be deposited at the Ministry of Foreign Affairs at The Hague.

The Government of the Netherlands will every month notify the signatory Powers of the ratifications which they have received in the interval.

As soon as the ratifications of all the signatory Powers, as well on their own behalf as on behalf of their own colonies, possessions, protectorates, and leased territories, have been received by the Government of the Netherlands, the latter will notify all the Powers who have ratified the convention of the date on which it received the last instrument of ratification.

Article 24.

The present convention shall come into force three months after the date mentioned in the notification by the Government of the Netherlands, referred to in the last paragraph of the preceding article.

With regard to the laws, regulations, or other measures contemplated by the present convention, it is agreed that the Bills or drafts required for this purpose shall be prepared not later than six months after the entry into force of the convention. As regards the laws, they shall also be submitted by their Governments to the Parliaments or legislative bodies within the same period of six months, or in any case at the first session following the expiration of this period.

The date on which these laws, regulations or measures shall come into force shall form the subject of an agreement between the contracting Powers, at the instance of the Government of the Netherlands.

In the event of questions arising relative to the ratification of the present convention, or to the enforcement either of the convention or of the laws, regulations, or measures resulting therefrom, the Government of the Netherlands will, if these questions cannot be settled by other means, invite all the contracting Powers to appoint delegates to meet at The Hague in order to arrive at an immediate agreement on these questions.

Article 25.

If one of the contracting Powers should wish to denounce the present convention, the denunciation shall be notified in writing to the Government of the Netherlands, who will immediately communicate a certified copy of the notification to all the other Powers, informing them of the date on which it was received.

The denunciation shall take effect only as regards the Power which notified it, and one year after the notification thereof has reached the Government of the Netherlands.

In witness whereof the plenipotentiaries have affixed their signatures to the present convention.

Done at The Hague the 23rd January, 1912, in a single copy, which shall be deposited and remain in the archives of the Government of the

Netherlands, and of which certified copies will be transmitted through the diplomatic channel to all the Powers represented at the conference.

For Germany:

F. VON MULLER.

DELBRUCK.

GRUNENWALD.

For the United States of America:

CHARLES H. BRENT.

HAMILTON WRIGHT.

HENRY J. FINGER.

For China:

LIANG CHENG.

For France:

H. BRENIER.

With the reservation that a separate and special ratification or denunciation may subsequently be obtained for the French protectorates.

For Great Britain:

W. S. MEYER.

G. W. MAX MULLER.

WILLIAM JOB COLLINS.

With the reservation of the following declaration:

The articles of the present convention, if ratified by His Britannic Majesty's Government, shall apply to the Government of British India, Ceylon, the Straits Settlements, Hong Kong, and Wei-hai Wei in every respect in the same way as they shall apply to the United Kingdom of Great Britain and Ireland, but His Britannic Majesty's Government reserve the right of signing or denouncing separately the said convention in the name of any dominion, colony, dependency, or protectorate of His Majesty other than those which have been specified.

For Italy:

G. DE LA TOUR CALVELLO.

For Japan:

AIMARO SATO.

TOMOE TAKAGI.

KOTARO NISHIZAKI.

For the Netherlands:

J. T. CREMER.

C. TH. VAN DEVENTER.

A. A. DE JONGH.

J. G. SCHEURER.

For Persia:

MIRZA MAHMOUD KHAN.

With the reservation of articles 15, 16, 17, 18, and 19 (Persia having no treaty, with China), and paragraph (*a*) of article 3.

For Portugal:

ANTONIO MARIA BARTHOLOMEU FERREIRA.

For Russia:

A. SAVINSKY.

For Siam:

AKHARAJ VARADHARA.

WM. J. ARCHER.

With the reservation of articles 15, 16, 17, 18, and 19, Siam having no treaty with China.

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(2)

FINAL PROTOCOL OF THE INTERNATIONAL OPIUM CONFERENCE.

THE International Opium Conference proposed by the Government of the United States of America, and convoked by the Government of the Netherlands, assembled at The Hague, in The Hall of the Knights, on the 1st December, 1911.

The Governments hereinafter enumerated took part in the conference, for which they had appointed the following delegates:—

Germany: His Excellency M. Felix von Müller, Privy Councillor, Envoy Extraordinary and Minister Plenipotentiary at The Hague, First Delegate Plenipotentiary; M. Delbrück, Privy Councillor, Delegate Plenipotentiary; Dr. Grünenwald, Councillor of Legation, Delegate Plenipotentiary; Dr. Kerp, Privy Councillor, Director of the German Health Department, Delegate Plenipotentiary; Dr. Rössler, German Consul at Canton, Delegate Plenipotentiary.

The United States of America: Bishop Charles H. Brent, Delegate Plenipotentiary; Mr. Hamilton Wright, Delegate Plenipotentiary; Mr. H. J. Finger, Delegate Plenipotentiary.

China: His Excellency Liang Ch'eng, Envoy Extraordinary and Minister Plenipotentiary at Berlin, Delegate Plenipotentiary: T'ang Kwo-an, Assistant Secretary at the Wai-wu Pu, Delegate; Tchang Tsu-Sueng, chargé d'affairs *ad interim* at The Hague, Delegate; Dr. Wu

Lin-Teh, M.D. (Cambridge), Surgeon-Major, Director of the School of Medicine, Delegate; M. F. A. Carl, formerly Commissioner of the Imperial Maritime Customs at Newchwang, Delegate; M. A. J. Commijs, Assistant Secretary in the Department of the Inspector-General of Imperial Maritime Customs, Delegate.

France: M. Henri Brenier, Advisory Inspector of the Agricultural and Commercial Service of Indo-China, Delegate Plenipotentiary; M Pierre Guesde, Administrator of the Civil Service of Indo-China, Delegate Plenipotentiary; Dr. Gaide, Surgeon-Major of the Colonial Troops, Technical Adviser.

Great Britain: The Right Honourable Sir Cecil Clementi Smith, G.C.M.G., Member of the Privy Council, Delegate Plenipotentiary; Sir William Stevenson Meyer, K.C.I.E., Chief Secretary to the Government of Madras, Delegate Plenipotentiary; Mr. William Grenfell Max Müller, C.B., M.V.O., Councillor of Embassy, Delegate Plenipotentiary; Sir William Job Collins, M.D., Deputy Lieutenant of the County of London, Delegate Plenipotentiary.

Italy: His Excellency Count J. Sallier de la Tour, Duke of Calvello, Envoy Extraordinary and Minister Plenipotentiary at The Hague, Delegate Plenipotentiary; Professor Rocco Santoliquido, Member of Parliament, Director-General of Public Health, Delegate.

Japan: His Excellency Mr. Aimaro Sato, Envoy Extraordinary and Minister Plenipotentiary at the Hague, Delegate Plenipotentiary; Dr. Tomoe Takagi, Engineer to the Government-General of Formosa, Delegate Plenipotentiary; Dr. Kotaro Nishizaki, Technical Expert, attached to the Laboratory of the Hygienic Department, Delegate Plenipotentiary.

The Netherlands: M. J. T. Cremer, formerly Minister for the Colonies, President of the Dutch Society of Commerce. Delegate Plenipotentiary; M. C. Th. van Deventer, Member of the First Chamber of the States-General, Delegate Plenipotentiary; M. A. A. de Jongh, formerly Inspector-General, Head of the Opium Monopoly in the Dutch Indies, Delegate Plenipotentiary; M. J. G. Scheurer, Member of the Second Chamber of the States-General, Delegate Plenipotentiary; M. W. G. van Wettum, Inspector of the Opium Monopoly in the Dutch Indies Delegate Plenipotentiary.

Persia: Mirza Mahmoud Khan, Secretary of the Persian Legation at The Hague, Delegate Plenipotentiary.

Portugal: His Excellency M. A. M. Bartholomeu Ferreira, Envoy Extraordinary and Minister Plenipotentiary at The Hague, Delegate Plenipotentiary; M. Oscar George Potier, Consul-General of the First Class, Delegate of the Ministry of Foreign Affairs, Delegate; M. A. Sanches de Miranda, Captain of Artillery, formerly Governor of Colonies, Delegate of the Ministry of the Colonies, Delegate.

Russia: His Excellency M. Alexander Savinsky, Master of Ceremonies of His Majesty the Emperor, Councillor of State Envoy Extraordinary and Minister Plenipotentiary at Stockholm, Delegate Plenipotentiary; M. Chapiroff, Honorary Physician at the Court of His Majesty the Emperor, Medical Inspector of the Frontier Guards, Delegate.

Siam: His Excellency Phya Akharaj Varadhara, Envoy Extraordinary and Minister Plenipotentiary in London. The Hague, and Brussels Delegate Plenipotentiary: Mr. William J. Archer, C.M.G., Councillor of Legation, Delegate Plenipotentiary.

At a series of meetings held from the 1st December, 1911, to the 23rd January, 1912, the conference drew up the annexed text of a convention.

The conference further expressed the following *vœux*:—

1. The conference considers it desirable to direct the attention of the Universal Postal Union—

(1) To the urgency of regulating the transmission through the post of raw opium;

(2) To the urgency of regulating as far as possible the transmission through the post of morphine, cocaine, and their respective salts and other substances referred to in article 14 of the convention;

(3) To the necessity of prohibiting the transmission of prepared opium through the post.

2. The conference considers it desirable to study the question of Indian hemp from the statistical and scientific point of view, with the object of regulating its abuses, should the necessity thereof be felt, by internal legislation or by an international agreement.

In witness whereof the plenipotentiaries have affixed their signatures to the present protocol.

Done at The Hague, the 23rd January, 1912, in a single copy, which shall be deposited and remain in the archives of the Netherlands Government, and certified copies of which shall be transmitted through the diplomatic channel to all the Powers represented at the conference.

For Germany:
F. VON MULLER.
DELRRUCK.
GRUNENWALD.

For the United States of America:
CHARLES H. BRENT.
HAMILTON WRIGHT.
HENRY J. FINGER.

For China:
LIANG CHENG.

For France:
H. BRENIER.

For Great Britain:
W. S. MEYER.
W. G. MAX MULLER.
WILLIAM JOB COLLINS.

For Italy:
G. DE LA TOUR CALVELLO.

For Japan:
AIMARO SATO.
TOMOE TAKAGI.
KOTARO NISHIZAKI.

For the Netherlands:

J. T. CREMER.

C. TH. VAN DEVENTER.

A. A. DE JONGH.

J. G. SCHEURER.

For Persia:

MIRZA MAHMOUD KHAN.

For Portugal:

ANTONIO MARIA BARTHOLOMEU FERREIRA.

For Russia:

A. SAVINSKY.

For Siam:

WM. J. ARCHER.

List of the countries that have signed and ratified the International Opium Convention, 1912 (Hague).

1. Africa, South.
2. America, United States of—.
3. Australia.
4. Austria.
5. Belgium.
6. Bolivia.
7. Brazil.
8. Bulgaria.
9. Canada.
10. Chile.
11. China.
12. Columbia.
13. Costa Rica.
14. Cuba.
15. Czecho-Slovakia.
16. Danzing.
17. Denmark.
18. Dominion Republic.
19. Ecuador.
20. Esthonia.
21. Finland.
22. France.
23. Germany.
24. Great Britain.
25. Greece.
26. Guatemala.
27. Haiti.
28. Honduras.
29. Hungary.
30. India.
31. Italy.
32. Japan.
33. Latvia.
34. Liberia.
35. Luxemburg.
36. Netherlands.
37. New Zealand.
38. Nicaragua.
39. Norway.
40. Panama.
41. Peru.
42. Poland.
43. Portugal.
44. Roumania.
45. Salvador.
46. Serbs, Croats and Slovenes, Kingdom of.
47. Siam.
48. Spain.
49. Sweden.
50. Switzerland.
51. Uruguay.
52. Tenezuela.

LEAGUE OF NATIONS.

FIRST OPIUM CONFERENCE.

AGREEMENT: PROTOCOL: FINAL ACT:

Signed at Geneva, February, 11th, 1925.

AGREEMENT.

THE BRITISH EMPIRE (WITH INDIA), CHINA, FRANCE, JAPAN, THE NETHERLANDS, PORTUGAL AND SIAM,

Being fully determined to bring about the gradual and effective suppression of the manufacture of, internal trade in and use of prepared opium, as provided for in Chapter II of the International Opium Convention of January 23rd, 1912, in their Far Eastern Possessions and Territories, including leased or protected territories, in which the use of prepared opium is temporarily authorised; and

Being desirous, on the grounds of humanity and for the purpose of promoting the social and moral welfare of their peoples, of taking all possible steps for achieving the suppression of the use of opium for smoking with the least possible delay;

Having decided to conclude an agreement supplementary to the said International Convention;

Have nominated for this purpose as their plenipotentiaries:

His Majesty the King of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, Emperor of India:

Sir Malcolm Delevingne, K.C.B., Assistant Under-Secretary of State for the Home Department,

And for India:

Mr. Harold Clayton, C.I.E., I.C.S.

The President of the Chinese Republic:

The President of the French Republic:

Mr. Ed. Daladier, Minister for the Colonies,

His Majesty the Emperor of Japan:

Mr. Sagataro Kaku, former Civil Governor of the General Government of Taiwan,

Mr. Yotaro Sugimura, Counsellor of Embassy, Assistant Head of the Imperial Japanese Bureau accredited to the League of Nations,

Her Majesty the Queen of the Netherlands:

Mr. W. G. van Wettum, former Head of the Opium Régie Department in the Netherlands Indies,

Mr. de Kat Angelino, Secretary for Chinese affairs to the Government of the Netherlands Indies,

The President of the Portuguese Republic:

Mr. A. Bartholomeu Ferreira, Envoy Extraordinary and Minister Plenipotentiary of the Portuguese Republic to the Swiss Federal Council,

Mr. Rodrigo-Rodrigues, Governor of the Province of Macao.

His Majesty the King of Siam:

H. S. H. Prince Damras, Siamese Charge d'Affaires at The Hague,

Who, having examined the present situation in regard to the application of Chapter II of the said International Opium Convention in the above-mentioned Far Eastern possessions and territories; and

Taking note of the fact that the increase of the smuggling of opium in the greater part of the territories in the Far East since the ratification of the Convention is hampering greatly the accomplishment of the gradual and effective suppression of the manufacture of, internal trade in, and use of prepared opium, as provided for in the Convention, and is even rendering less effective some of the measures already taken for that end; and

Taking into account the different situations of the several countries,

Having deposited their full powers found in good and due form;

Have agreed as follows:—

Article I.

1. Except as provided in paragraph 3 of this article with regard to retail sale, the importation, sale and distribution of opium shall be a monopoly of the Government and the right to import, sell or distribute opium shall not be leased, accorded or delegated to any persons whatever.

2. The making of prepared opium for sale shall also be made a monopoly of the Government as soon as circumstances permit.

3(*a*). The system of employing persons paid by a fixed salary and not by a commission on sales for the retail sale and distribution of opium shall be applied experimentally in those districts where an effective supervision can be exercised by the administrative authorities.

(*b*). Elsewhere the retail sale and distribution of opium shall be conducted only by persons licensed by the Government.

Paragraph (*a*) need not be applied if a system of licensing and rationing of smokers is in force which affords equivalent or more effective guarantees.

Article II.

The sale of opium to minors shall be prohibited. All possible steps shall be taken by the Contracting Powers to prevent the spread of the habit of opium smoking among minors.

Article III.

No minors shall be permitted to enter any smoking divan.

Article IV.

The Contracting Powers shall limit as much as possible the number of retail shops and, where smoking divans are permitted, the number of divans.

Article V.

The purchase and sale of "dross", except when the "dross" is sold to the monopoly, is prohibited.

Article VI.

(1) The export of opium, whether raw or prepared, from any Possession or Territory into which opium is imported for the purpose of smoking shall be prohibited.

(2) The transit through, or trans-shipment in, any such Possession or Territory of prepared opium shall be prohibited.

(3) The transit through, or trans-shipment in, any such Possession or Territory of raw opium consigned to a destination outside the Possession or Territory shall also be prohibited unless an import certificate, issued by the Government of the importing country, which can be accepted as affording sufficient guarantees against the possibility of illegitimate use, is produced to the Government of the Possession or Territory.

Article VII.

The Contracting Powers shall use utmost efforts by suitable instruction in the schools, dissemination of literature and otherwise, to discourage the use of prepared opium within their respective territories, except where a Government considers such measures to be undesirable under the conditions existing in its territory.

Article VIII.

The Contracting Powers undertake to assist one another in their efforts to suppress the illicit traffic by the direct exchange of information and views between the heads of the services concerned.

Article IX.

The Contracting Powers will examine in the most favourable spirit the possibility of taking legislative measures to render punishable illegitimate transactions which are carried out in another country by a person residing within their territories.

Article X.

The Contracting Powers will furnish all information which they can obtain with regard to the number of opium smokers. This information shall be transmitted to the Secretary-General of the League of Nations for publication.

Article XI.

The provisions of this agreement shall not apply to opium destined solely for medical and scientific purposes.

Article XII.

The Contracting Powers agree that they will jointly review from time to time at such dates as may be mutually agreed, the position in regard to the application of Chapter II of the Hague Convention of January 23rd, 1912, and of the present Agreement. The first meeting shall take place at latest in 1929.

Article XIII.

The present Agreement applies only to the Far Eastern Possessions or territories of the Contracting Powers, including leased or protected territories, in which the use of prepared opium is temporarily authorised.

At the moment of ratification any Contracting Power may declare that its acceptance of the Agreement does not include any territory over which it exercises only a protectorate; and may accede subsequently in respect of any protectorate thus excluded by means of a notification of accession deposited with the Secretary-General of the League of Nations who shall forthwith notify the accession to all the other Contracting Powers.

Article XIV.

The present Agreement, of which the French and English texts are both authentic, shall be subject to ratification.

The deposit of ratification shall be made at the Secretariat of the League of Nations as soon as possible.

The Agreement shall not come into force until it has been ratified by two Powers. The date of its coming into force shall be the 90th day after the receipt by the Secretary-General of the League of Nations of the second ratification. Thereafter the Agreement shall take effect for each Contracting Power 90 days after the receipt of its ratification.

The Agreement shall be registered by the Secretary-General of the League of Nations upon the day of its coming into force.

Article XV.

If one of the Contracting Powers should wish to denounce the present Agreement, the denunciation shall be notified in writing to the Secretary-General of the League of Nations who will immediately communicate a copy of the notification to all the other Powers, informing them of the date on which it was received.

The denunciation shall take effect only as regards the Power which notified it, and one year after the notification thereof has reached the Secretary-General.

In faith whereof the above-named plenipotentiaries have signed the present Agerement.

Done at Geneva, the eleventh day of February of nineteen hundred and twenty-five. in a single copy which shall remain deposited in the

archives of the Secretariat of the League of Nations, and of which authenticated copies shall be transmitted to all the Contracting Powers.

For British Empire:
MALCOLM DELEVINGNE.

For India:
HAROLD CLAYTON.

For China:

For France:
ED. DALADIER.

For Japan:
S. KAKU.
Y. SUGIMURA.

For the Netherlands:
V. WETTUM.
A. D. A. DE KAT ANGELINO.

For Portugal:
A. M. BARTHOLOMEU FERREIRA.
RODRIGO J. RODRIGUES.

For Siam:
DAMRAS.

PROTOCOL.

The undersigned representatives of the States signatory to the Agreement relating to the use of prepared opium signed this day, duly authorised to that effect;

Anxious to ensure the complete and final execution of the obligations, and to strengthen the undertakings assumed by them under Article VI of the Hague Convention of 1912;

Taking note of the fact that the Second Opium Conference has decided to adopt a Protocol by which certain Powers are to establish within five years at latest an effective control over the production, distribution and export of raw opium, so as to prevent illicit traffic.

Hereby agree as follows:

Article I.

The State signatories of the present Protocol recognise that the provisions of the Agreement signed this day are supplementary to, and designed to facilitate the execution of the obligation assumed by the signatory States under Article VI of the Hague Convention of 1912, which obligation remains in full force and effect.

Article II.

As soon as the poppy-growing countries have ensured the effective execution of the necessary measures to prevent the exportation of raw opium from their territories from constituting a serious obstacle to the reduction of consumption in the countries where the use of prepared opium is temporarily authorised, the States signatories of the present Protocol will strengthen the measures already taken in accordance with Article VI of the Hague Convention of 1912, and will take any further measures which may be necessary, in order to reduce consumption of prepared opium in the territories under their authority, so that such use may be completely suppressed within a period of not more than fifteen years from the date of the decision referred to in the following Article.

Article III.

A Commission to be appointed at the proper time by the Council of the League of Nations shall decide when the effective execution of the measures, mentioned in the preceding Article, to be taken by the poppy-growing countries has reached the stage referred to in that Article. The decision of the Commission shall be final.

Article IV.

In the event of any of the State signatories of the present Protocol finding, at any time during the period of fifteen years referred to in Article II, that the measures to be taken by the poppy-growing countries, referred to in the said Article, are no longer being effectively executed, such State shall have the right to bring the matter to the notice of the Council of the League of Nations. If the Council, whether by the report of a Cmomission appointed by it to investigate and report up on the facts, or by any other information at its disposal is satisfied that the facts are as stated, the States concerned will be entitled to denounce the present Protocol. In that case a Conference of the States concerned shall at once be held to consider the action to be taken.

Article V.

During the year preceding the end of the period of fifteen years referred to in Article II, a special Conference of the States signatories of the present Protocol shall be held to consider the measures to be taken in regard to habitual addicts whose pathological condition is certified by the medical authorities of the country concerned.

Article VI.

The States signatories of the present Protocol will co-ordinate their efforts to effect the complete and final suppression of the use of prepared opium. In order to attain this object as soon as possible the said States, recognising the difficulties at present experienced by certain Powers in establishing an effective control over the production, distribution and exportation of raw opium, make a pressing appeal to the poppy-growing countries for the establishment between all the States concerned of a sincere and energetic collaboration which will lead to the termination of the illicit traffic.

Article VII.

The present Protocol shall come into force for each of the signatory States at the same time as the Agreement relating to the use of prepared opium signed this day.

Article VIII.

Any States represented at the Conference at which the present Protocol was drawn up may accede to it any time after its coming into force.

Done at Geneva, the eleventh day of February, one thousand nine hundred and twenty-five.

For British Empire:
MALCOLM DELEVINGNE.

For India:
HAROLD CLAYTON.

For China:

For France:
ED. DALADIER.

For Japan:
S. KAKU.
Y. SUGIMURA.

For the Netherlands:
V. WETTUM.
A. D. A. DE KAT ANGELINO.

For Portugal:
A. M. BARTHOLOMEU FERREIRA.
RODRIGO J. RODRIGUES.

For Siam:
DAMRAS.

FINAL ACT OF THE CONFERENCE ON THE APPLICATION IN THE FAR EAST OF CHAPTER II OF THE INTERNATIONAL OPIUM CONVENTION OF JANUARY 23RD, 1912.

Convened at Geneva on November 3rd, 1924.

The Conference convened by the Council of the League of Nations in accordance with the Resolution adopted by the Assembly of the League on September 27th, 1923, met in the offices of the Secretariat of the League on November 3rd, 1924.

The Governments below enumerated took part in the Conference, for which they had appointed the following plenipotentiaries:

BRITISH EMPIRE WITH INDIA:

Sir Malcolm Delevingne, K.C.B., Assistant Under-Secretary of State for the Home Department,

INDIA:

Mr. John Campbell, C.S.I., O.B.E., I.C.S., (retired),

Mr. Harold Clayton, C.I.E., I.C.S.,

CHINA:

His Excellency Mr. Sao Ke Alfred Sze, Ambassador, Envoy Extraordinary and Minister Plenipotentiary to the United States of America,

His Excellency Mr. Wang Kouang Ky, Envoy Extraordinary and Minister Plenipotentiary to Her Majesty the Queen of the Netherlands,

His Excellency Mr. Chao-Hsin Chu, Minister Plenipotentiary, Chargé d'Affaires in London,

FRANCE:

His Excellency Mr. Ed. Daladier, Minister for the Colonies,

JAPAN:

Mr. Sagataro Kaku, former Civil Governor of the General Government of Taiwan,

Mr. Yotaro Sugimura, Counsellor of Embassy, Assistant Head of the Imperial Japanese Bureau accredited to the League of Nations,

THE NETHERLANDS:

Mr. W. G. van Wettum, former Head of the Opium Régie Department in the Netheralnds Indies,

Mr. de Kat Angelino, Secretary for Chinese Affairs to the Government of the Netherlands Indies,

PORTUGAL:

His Excellency Mr. A. Bartholomeu Fereira, Envoy Extraordinary and Minister Plenipotentiary of the Portuguese Republic to the Swiss Federal Council,

Mr. Rodrigo Rodrigues, Governor of the Province of Macao,

SIAM:

His Serene Highness Prince Damras, Siamese Chargé d'Affaires at The Hague,

At a series of meetings, the Conference drew up the supplementary Agreement and the Protocol which bear this day's date.

The Conference, with the exception of the Chinese Delegation, further adopted the following Resolution:—

"It has been pointed out to the Conference that in some countries the system of licences (or registration) and rationing has been successful in diminishing the number of smokers.

"At the same time, the Conference has found that, in other countries, the contraband trade which equals and even surpasses in extent the legitimate trade, renders the application of this system difficult, and in the opinion of the Governments in question, useless and in some cases dangerous.

"Accordingly, the Conference declares that the possibility of adopting these measures or of maintaining them in those territories where they are now working successfully, depends principally upon the extent of the contraband trade.

"It therefore leaves to the Contracting Powers which have not yet applied this system the duty of selecting the movement when circumstances will allow of its adoption and of taking in the meantime all such preparatory measures as they may deem expedient".

The Representative of the British Empire declared that he signed the Protocol subject to the following declaration:—

"I declare that my signature of this Protocol is subject, in respect of British Protectorates, to the conditions contained in Article XIII of the Agreement signed this day".

The Representative of Portugal, on signing the Agreement, made the following declarations:—

(1) "The Portuguese Government, while accepting the principle of a monopoly as formulated in Article I, does so, as regards the moment at which the measures provided for in the first paragraph thereof shall come into force, subject to the limitation contained in the second paragraph of the article.

(2) "The Portuguese Government being bound by a contract consistent with the provisions of the Hague Convention of 1912, will not be able to put into operation the provisions of paragraph 1 of Article 6 of the present Agreement so long as its obligations under this contract are in force."

The Representative of Siam declared that he signed the Agreement subject to the following declaration:—

"This Siamese Delegation is instructed to sign the Agreement under reservation of Article I, paragraph 3 (*a*) with regard to the time when this provision shall come into force and of Article V. The reason for these reservations has been stated by the First Delegate of Siam on the 14th November, 1924. The Siamese Government is hoping to put into force the system of regsitration and rationing within the period of three years. After that date, the reservation in regard to Article I, paragraph 3 (*a*) will fall to the ground."

In witness whereof, the above-named plenipotentiaries have signed the present Act.

Done at Geneva, the eleventh day of February, nineteen hundred and twenty-five, in a single copy which shall remain deposited in the Secretariat of the League of Nations and of which authenticated copies shall be transmitted to all the Powers represented at the Conference.

For British Empire:
MALCOLM DELEVINGNE.

For India:
HAROLD CLAYTON.

For China:

For France:
ED. DALADIER.

For Japan:
S. KAKU.
Y. SUGIMURA.

For The Netherlands:
V. WETTUM.
A. D. A. de KAT ANGELINO.

For Portugal:
A. M. BARTHOLOMEU FERREIRA.
RODRIGO J. RODRIGUES.

For Siam:
DAMRAS.

LEAGUE OF NATIONS.

SECOND OPIUM CONFERENCE.

CONVENTION: PROTOCOL: FINAL ACT.

Signed at Geneva on February 19th, 1925.

CONVENTION.

Taking note of the fact that the application of the provisions of the Hague Convention of January 23rd, 1912, by the Contracting Parties has produced results of great value, but that the contraband trade in and abuse of the substances to which the Convention applies still continue on a great scale;

Convinced that the contraband trade in and abuse of these substances cannot be effectually suppressed except by bringing about a more effective limitation of the production or manufacture of the substances, and by exercising a closer control and supervision of the international trade, than are provided for in the said Convention;

Desirous therefore of taking further measures to carry out the objects aimed at by the said Convention and to complete and strengthen its provisions;

Realising that such limitation and control require the close co-operation of all the Contracting Parties;

Confident that this humanitarian effort will meet with the unanimous adhesion of the nations concerned:

Have decided to conclude a Convention for this purpose.

The High Contracting Parties have accordingly appointed as their Plenipotentiaries:

[*Here follow the names of heads of States and their Plenipotentiaries.*] who, after communicating their full powers, found in good and due form, have agreed as follows:

CHAPTER I.—DEFINITIONS.

Article 1.

The Contracting Parties agree to adopt the following definitions for the purposes of the present Convention:

Raw Opium.—"Raw opium" means the spontaneously coagulated juice obtained from the capsules of the *Papaver somniferum L.*, which has only been submitted to the necessary manipulations for packing and transport, whatever its content of morphine.

Medicinal Opium.—"Medicinal opium" means raw opium which has undergone the processes necessary to adapt it for medicinal use in accordance with the requirements of the national pharmacopœia, whether in powder form or granulated or otherwise or mixed with neutral materials.

Morphine.—"Morphine" means the principal alkaloid of opium having the chemical formula C_{17} H_{19} NO_3.

Diacetylmorphine.—"Diacetylmorphine" means diacetylmorphine (diamorphine, heroin) having the formula H_{23} NO_5.

Coca Leaf.—"Coca leaf" means the leaf of the *Erythroxylon Coca Lamarck* and the *Erythroxylon novo-granatense* (Morris) Hireonymus and their varieties, belonging to the family of Erythroxylaceæ and the leaf of other species of this genus from which it may be found possible to extract cocaine either directly or by chemical transformation.

Crude Cocaine.—"Crude cocaine" means any extract of the coca leaf which can be used directly or indirectly for the manufacture of cocaine.

Cocaine.—"Cocaine" means methyl-benzoyl lævo-ecgonine ($^{[a]}$ D20°= —16°4 in 20 per cent. solution of chloroform), of which the formula is C_{17} H_{21} NO_4.

Ecgonine.—"Ecgonine" means lævo-ecgonine ($^{[a]}$ D20°= —45°6 in 5 per cent. solution of water), of which the formula C_9 H_{15} NO_3. H_2 O, and all the derivatives of lævo-ecgonine which might serve industrially for its recovery.

Indian Hemp.—"Indian hemp" means the dried flowering or fruiting tops of the pistillate plant *Cannabis sativa L.*, from which the resin has not been extracted, under whatever name they may be designated in commerce.

Chapter II.—Internal Control of Raw Opium and Coca Leaves.

Article 2.

The Contracting Parties undertake to enact laws and regulations to ensure the effective control of the production, distribution and export of raw opium, unless laws and regulations on the subject are already in existence; they also undertake to review periodically, and to strengthen as required, the laws and regulations on the subject which they have enacted in virtue of Article 1 of the Hague Convention of 1912 or of the present Convention.

Article 3.

Due regard being had to the differences in their commercial conditions, the Contracting Parties shall limit the number of towns, ports or other localities through which the export or import of raw opium or coca leaves shall be permitted.

Chapter III.—Internal Control of Manufactured Drugs.

Article 4.

The provisions of the present Chapter apply to the following substance:

(*a*) Medicinal opium;

(*b*) Crude cocaine and ecgonine;

(*c*) Morphine, diacetylmorphine, cocaine and their respective salts;

(*d*) All preparations official and non-official (including the so-called anti-opium remedies) containing more than 0·2 per cent. of morphine or more than 0·1 per cent. of cocaine;

(*e*) All preparations containing diacetylmorphine;

(*f*) Galenical preparations (extract and tincture) of Indian hemp;

(*g*) Any other narcotic drug to which the present Convention may be applied in accordance with Article 10.

Article 5.

The Contracting Parties shall enact effective laws or regulations to limit exclusively to medical and scientific purposes the manufacture, import, sale, distribution, export and use of the substances to which this Chapter applies. They shall co-operate with one another to prevent the use of these substances for any other purposes.

Article 6.

The Contracting Parties shall control all persons manufacturing, importing, selling, distributing or exporting the substances to which this Chapter applies, as well as the buildings in which these persons carry on such industry or trade.

With this object, the Contracting Parties shall:

(*a*) Confine the manufacture of the substances referred to in Article 4 (*b*), (*c*) and (*g*) to those establishments and premises alone which have been licensed for the purpose.

(*b*) Require that all persons engaged in the manufacture, import, sale, distribution, or export of the said substances shall obtain a licence or permit to engage in these operations;

(*c*) Require that such persons shall enter in their books the quantities manufactured, imports, exports, sales and all other distribution of the said substances. This requirement shall not necessarily apply either to supplies dispensed by medical practitioners, or to sales by duly authorised chemists on medical prescriptions, provided in each case the medical prescriptions are filed and preserved by the medical practitioner or chemist.

Article 7.

The Contracting Parties shall take measures to prohibit, as regards their internal trade, the delivery to or possession by any unauthorised persons of the substances to which this Chapter applies.

Article 8.

In the event of the Health Committee of the League of Nations, after having submitted the question for advice and report to the Permanent Committee of the Office international d'Hygiène publique in Paris finding that any preparation containing any of the narcotic drugs referred to in the present Chapter cannot give rise to the drug habit on account of the medicaments with which the said drugs are compounded and which in practice preclude the recovery of the said drugs, the Health Committee shall communicate this finding to the Council of the League of Nations.

The Council will communicate the finding to the Contracting Parties, and thereupon the provisions of the present Convention will not be applicable to the preparation concerned.

Article 9.

Any Contracting Party may authorise the supply to the public by chemists, at their own discretion, as medicines, for immediate use in urgent cases, of the following opiate officinal preparations: tincture of opium, Sydenham laudanum and Dover powder. The maximum dose, however, which may be supplied in such cases must not contain more than 25 centigrammes of officinal opium, and the chemist must enter in his books the quantities supplied, as provided in Article 6 (*c*).

Article 10.

In the event of the Health Committee of the League of Nations, after having submitted the question for advice and report to the Permanent Committee of the Office international d'Hygiène publique in Paris, finding that any narcotic drug to which the present Convention does not apply is liable to similar abuse and productive of similar ill-effects as the substances to which this Chapter of the Convention applies, the Health Committee shall inform the Council of the League accordingly and recommend that the provisions of the present Convention shall be applied to such drug.

The Council of the League shall communicate the said recommendation to the Contracting Parties. Any Contracting Party which is prepared to accept the recommendation shall notify the Secretary-General of the League, who will inform the other Contracting Parties.

The provisions of the present Convention shall thereupon apply to the substance in question as between the Contracting Parties who have accepted the recommendation referred to above.

Chapter IV.—Indian Hemp.

Article 11.

1. In addition to the provisions of Chapter V of the present Convention, which shall apply to Indian hemp and the resin prepared from it, the Contracting Parties undertake:

(*a*) To prohibit the export of the resin obtained from Indian hemp and the ordinary preparations of which the resin forms the base (such as hashish, esrar, chiras, djamba) to countries which have prohibited their use, and, in cases where export is permitted, to require the production of a special import certificate issued by the Government of the importing country stating that the importation is approved for the purposes specified in the certificate and that the resin or preparations will not be re-exported;

(*b*) Before issuing an export authorisation under Article 13 of the present Convention, in respect of Indian hemp, to require the production of a special import certificate issued by the Government of the importing country and stating that the importation is approved and is required exclusively for medical or scientific purposes.

2. The Contracting Parties shall exercise an effective control of such a nature as to prevent the illicit international traffic in Indian hemp and especially in the resin.

CHAPTER V.—CONTROL OF INTERNATIONAL TRADE.

Article 12.

Each Contracting Party shall require a separate import authorisation to be obtained for each importation of any of the substances to which the present Convention applies. Such authorisation shall state the quantity to be imported, the name and address of the importer and the name and address of the exporter.

The import authorisation shall specify the period within which the importation must be effected and may allow the importation in more than one consignment.

Article 13.

1. Each Contracting Party shall require a separate export authorisation to be obtained for each exportation of any of the substances to which the present Convention applies. Such authorisation shall state the quantity to be exported, the name and address of the exporter and the name and address of the importer.

2. The Contracting Party, before issuing such export authorisation, shall require an import certificate, issued by the Government of the importing country and certifying that the importation is approved, to be produced by the person or establishment applying for the export authorisation.

Each Contracting Party agrees to adopt, so far as possible, the form of import certificate annexed to the present Convention.

3. The export authorisation shall specify the period within which the exportation must be effected, and shall state the number and date of the import certificate and the authority by whom it has been issued.

4. A copy of the export authorisation shall accompany the consignment and the Government issuing the export authorisation shall send a copy to the Government of the importing country.

5. The Government of the importing country, when the importation has been effected, or when the period fixed for the importation has expired, shall return the export authorisation, with an endorsement to that effect, to the Government of the exporting country. The endorsement shall specify the amount actually imported.

6. If a less quantity than that specified in the export authorisation is actually exported, the quantity actually exported shall be noted by the competent authorities on the export authorisation and on any official copy thereof.

7. In the case of an application to export a consignment to any country for the purpose of being placed in a bonded warehouse in that country, a special certificate from the Government of that country, certifying that it has approved the introduction of the consignment for the said purpose, may be accepted by the Government of the exporting country in place

of the import certificate provided for above. In such a case, the export authorisation shall specify that the consignment is exported for the purpose of being placed in a bonded warehouse.

Article 14.

For the purpose of ensuring the full application and enforcement of the provisions of the present Convention in free ports and free zones, the Contracting Parties undertake to apply in free ports and free zones situated within their territories the same laws and regulations, and to exercise therein the same supervision and control, in respect of the substances covered by the said Convention, as in other parts of their territories.

This Article does not, however, prevent any Contracting Party from applying, in respect of the said substances, more drastic provisions in its free ports and free zones than in other parts of its territories.

Article 15.

1. No consignment of any of the substances covered by the present Convention which is exported from one country to another country shall be permitted to pass through a third country, whether or not it is removed from the ship or conveyance in which it is being conveyed, unless the copy of the export authorisation (or the diversion certificate, if such a certificate has been issued in pursuance of the following paragraph) which accompanies the consignment is produced to the competent authorities of that country.

2. The competent authorities of any country through which a consignment of any of the substances covered by the present Convention is permitted to pass shall take all due measures to prevent the diversion of the consignment to a destination other than that named in the copy of the export authorisation (or the diversion certificate) which accompanies it, unless the Government of that country has authorised that diversion by means of a special diversion certificate. A diversion certificate shall only be issued after the receipt of an import certificate, in accordance with Article 13, from the Government of the country to which it is proposed to divert the consignment, and shall contain the same particulars as are required by Article 13 to be stated in an export authorisation, together with the name of the country from which the consignment was originally exported. All the provisions of Article 13 which are applicable to an export authorisation shall be applicable equally to the diversion certificate.

Further, the Government of the country authorising the diversion of the consignment shall detain the copy of the original export authorisation (or diversion certificate) which accompanied the consignment on arrival in its territory, and shall return it to the Government which issued it, at the same time notifying the name of the country to which the diversion has been authorised.

3. In cases where the transport is being effected by air, the preceding provisions of this Article shall not be applicable if the aircraft passes over the territory of the third country without landing. If the aircraft lands in the territory of the said country, the said provisions shall be applied so far as the circumstances permit.

4. Paragraphs 1 to 3 of this Article are without prejudice to the provisions of any international agreement which limits the control which may be exercised by any of the Contracting Parties over the substances to which the present Convention applies when in direct transit.

5. The provisions of this Article shall not apply to transport of the substances by post.

Article 16.

A consignment of any of the substances covered by the present Convention which is landed in the territory of any Contracting Party and placed in a bonded warehouse shall not be withdrawn from the bonded warehouse unless an import certificate, issued by the Government of the country of destination and certifying that the importation is approved, is produced to the authorities having jurisdiction over the bonded warehouse. A special authorisation shall be issued by the said authorities in respect of each consignment so withdrawn and shall take the place of the export authorisation for the purpose of Articles 13, 14 and 15 above.

Article 17.

No consignment of the substances covered by the present Convention while passing in transit through the territories of any Contracting Party or whilst being stored there in a bonded warehouse may be subjected to any process which would alter the nature of the substances in question or, without the permission of the competent authorities, the packing.

Article 18.

If any Contracting Party finds it impossible to apply any provision of this Chapter to trade with another country by reason of the fact that such country is not a party to the present Convention, such Contracting Party will only be bound to apply the provisions of this Chapter so far as the circumstances permit.

CHAPTER VI.—PERMANENT CENTRAL BOARD.

Article 19.

A Permanent Central Board shall be appointed, within three months from the coming into force of the present Convention.

The Central Board shall consist of eight persons who by their technical competence, unpartiality and disinterestedness, will command general confidence.

The members of the Central Board shall be appointed by the Council of the League of Nations.

The United States of America and Germany shall be invited each to nominate one person to participate in these appointments.

In making the appointments, consideration shall be given to the importance of including on the Central Board, in equitable proportion, persons possessing a knowledge of the drug situation, both in the producing and manufacturing countries on the one hand and in the consuming countries on the other hand, and connected with such countries.

The members of the Central Board shall not hold any office which puts them in a position of direct dependence on their Governments.

The members shall be appointed for a term of five years, and they will be eligible for re-appointment.

The Central Board shall elect its own President and shall settle its rules of procedure.

At meetings of the Board, four members shall form a quorum.

The decisions of the Board relative to Articles 24 and 26 shall be taken by an absolute majority of the whole number of the Board.

Article 20.

The Council of the League of Nations shall, in consultation with the Board, make the necessary arrangements for the organisation and working of the Board, with the object of assuring the full technical independence of the Board in carrying out its duties under the present Convention, while providing for the control of the staff in administrative matters by the Secretary-General.

The Secretary-General shall appoint the secretary and staff of the Board on the nomination of the Board and subject to the approval of the Council.

Article 21.

The Contracting Parties agree to send in annually before December 31st, to the Permanent Central Board set up under Article 19, estimates of the quantities of each of the substances covered by the Convention to be imported into their territory for internal consumption during the following year for medical, scientific and other purposes.

These estimates are not to be regarded as binding on the Govenrment concerned, but will be for the purpose of serving as a guide to the Central Board in the discharge of its duties.

Should circumstances make it necessary for any country, in the course of the year, to modify its estimates, the country in question shall communicate the revised figures to the Central Board.

Article 22.

1. The Contracting Parties agree to send annually to the Central Board, in a manner to be indicated by the Board, within three (in the case of paragraph (*c*), five) months after the end of the year, as complete and accurate statistics as possible relative to the preceding year, showing:

(*a*) Production of raw opium and coca leaves;

(*b*) Manufacture of the substances covered by Chapter III, Article 4 (*b*), (*c*) and (*g*) of the present Convention and the raw material used for such manufacture. The amount of such substances used for the manufacture of other derivatives not covered by the Convention shall be separately stated;

(*c*) Stocks of the substances covered by Chapters II and III of the present Convention in the hands of wholesalers or held by the Government for consumption in the country for other than Government purposes;

(*d*) Consumption, other than for Government purposes, of the substances covered by Chapters II and III of the present Convention;

(*e*) Amounts of each of the substances covered by the present Convention which have been confiscated on account of illicit import or export; the manner in which the confiscated substances have been disposed of shall be stated, together with such other information as may be useful in regard to such confiscation and disposal.

The statistics referred to in paragraphs (*a*) to (*e*) above shall be communicated by the Central Board to the Contracting Parties.

2. The Contracting Parties agree to forward to the Central Board, in a manner to be prescribed by the Board, within four weeks after the end of each period of three months, the statistics of their imports from and exports to each country of each of the substances covered by the present Convention during the preceding three months. These statistics will, in such cases as may be prescribed by the Board, be sent by telegram, except when the quantities fall below a minimum amount which shall be fixed in the case of each substance by the Board.

3. In furnishing the statistics in pursuance of this Article, the Governments shall state separately the amounts imported or purchased for Government purposes, in order to enable the amounts required in the country for general medical and scientific purposes to be ascertained. It shall not be within the competence of the Central Board to question or to express any opinion on the amounts imported or purchased for Government purposes or the use thereof.

4. For the purposes of this Article, substances which are held, imported, or purchased by the Government for eventual sale are not regarded as held imported or purchased for Government purposes.

Article 23.

In order to complete the information of the Board as to the disposal of the world's supply of raw opium, the Governments of the countries where the use of prepared opium is temporarily authorised shall, in a manner to be prescribed by the Board, in addition to the statistics provided for in Article 22, forward annually to the Board, within three months after the end of the year, as complete and accurate statistics as possible relative to the preceding year showing:

(1) The manufacture of prepared opium, and the raw material used for such manufacture;

(2) The consumption of prepared opium.

It is understood that it shall not be within the competence of the Board to question or to express any opinion upon these statistics, and that the provisions of Article 24 are not applicable to the matters dealt with in this Article, except in cases where the Board may find that illicit international transactions are taking place on an appreciable scale.

Article 24.

1. The Central Board shall continuously watch the course of the international trade. If the information at its disposal leads the Board to conclude that excessive quantities of any substance covered by the

present Convention are accumulating in any country, or that there is a danger of that country becoming a centre of the illicit traffic, the Board shall have the right to ask, through the Secretary-General of the League, for explanations from the country in question.

2. If no explanation is given within a reasonable time or the explanation is unsatisfactory, the Central Board shall have the right to call the attention of the Governments of all the Conracting Parties and of the Council of the League of Nations to the matter, and to recommend that no further exports of the substances covered by the present Convention or any of them shall be made to the country concerned until the Board reports that it is satisfied as to the situation in that country in regard to the said substances. The Board shall at the same time notify the Government of the country concerned of the recommendation made by it.

3. The country concerned shall be entitled to bring the matter before the Council of the League.

4. The Government of any exporting country which is not prepared to act on the recommendation of the Central Board shall also be entitled to bring the matter before the Council of the League.

If it does not do so, it shall immediately inform the Board that it is not prepared to act on the recommendation, explaining, if possible, why it is not prepared to do so.

5. The Central Board shall have the right to publish a report on the matter and communicate it to the Council, which shall thereupon forward it to the Governments of all the Contracting Parties.

6. If in any case the decision of the Central Board is not unanimous, the views of the minority shall also be stated.

7. Any country shall be invited to be represented at a meeting of the Central Board at which a question directly interesting it is considered.

Article 25.

It shall be the friendly right of any of the Contracting Parties to draw the attention of the Board to any matter which appears to it to require investigation, provided that this Article shall not be construed as in any way extending the powers of the Board.

Article 26.

In the case of a country which is not a party to the present Convention, the Central Board may take the same measures as are specified in Article 24, if the information at the disposal of the Board leads it to conclude that there is a danger of the country becoming a centre of the illicit traffic; in that case the Board shall take the action indicated in the said Article as regards notification to the country concerned.

Paragraphs 3, 4 and 7 of Article 24 shall apply in any such case.

Article 27.

The Central Board shall present an annual report on its work to the Council of the League. This report shall be published and communicated to all the Contracting Parties.

The Central Board shall take all necessary measures to ensure that the estimates, statistics, information and explanations which it receives under Articles 21, 22, 23, 24, 25 or 26 of the present Convention shall not be made public in such a manner as to facilitate the operations of speculators or injure the legitimate commerce of any Contracting Party.

Chapter VII.—General Provisions.

Article 28.

Each of the Contracting Parties agrees that breaches of its laws or regulations by which the provisions of the present Convention are enforced shall be punishable by adequate penalties, including in appropriate cases the confiscation of the substances concerned.

Article 29.

The Contracting Parties will examine in the most favourable spirit the possibility of taking legislative measures to render punishable acts committed within their jurisdiction for the purpose of procuring or assisting the commission in any place outside their jurisdiction of any act which constitutes an offence against the laws of that place relating to the matters dealt with in the present Convention.

Article 30.

The Contracting Parties shall communicate to one another, through the Secretary-General of the League of Nations, their existing laws and regulations respecting the matters referred to in the present Convention, so far as this has not already been done, as well as those promulgated in order to give effect to the said Convention.

Article 31.

The present Convention replaces, as between the Contracting Parties, the provisions of Chapters I, III and V of the Convention signed at The Hague on January 23rd, 1912, which provisions remain in force as between the Contracting Parties and any States Parties to the said Convention which are not Parties to the present Convention.

Article 32.

1. In order as far as possible to settle in a friendly manner disputes arising between the Contracting Parties in regard to the interpretation or application of the present Convention which they have not been able to settle through diplomatic channels, the parties to such a dispute may, before resorting to any proceedings for judicial settlement or arbitration, submit the dispute for an advisory opinion to such technical body as the Council of the League of Nations may appoint for this purpose.

2. The Advisory opinion shall be given within six months commencing from the day on which the dispute has been submitted to the technical body, unless this period is prolonged by mutual agreement between the parties to the dispute. The technical body shall fix the period within which the parties are to decide whether they will accept the advisory opinion given by it.

3. The advisory opinion shall not be binding upon the parties to the dispute unless it is accepted by each of them.

4. Disputes which it has not been found possible to settle either directly or on the basis of the advice of the above-mentioned technical body shall, at the request of any one of the parties thereto, be brought before the Permanent Court of International Justice, unless a settlement is attained by way of arbitration or otherwise by application of some existing convention or in virtue of an arrangement specially concluded.

5. Proceedings shall be opened before the Permanent Court of International Justice in the manner laid down in Article 40 of the Statute of the Court.

6. A decision of the parties to a dispute to submit it for an advisory opinion to the technical body appointed by the Council of the League of Nations, or to resort to arbitration, shall be communicated to the Secretary-General of the League of Nations and by him to the other contracting Parties, which shall have the right to intervene in the proceedings.

7. The parties to a dispute shall bring before the Permanent Court of International Justice any question of international law or question as to the interpretation of the present Convention arising during proceedings before the technical body or arbitral tribunal, decision of which by the Court is, on the demand of one of the parties, declared by the technical body or arbitral tribunal to be necessary for the settlement of the dispute.

Article 33.

The present Convention, of which the French and English texts are both authentic, shall bear to-day's date and shall be open for signature until the 30th day of September, 1925, by any State represented at the Conference at which the present Convention was drawn up, by any Member of the League of Nations, and by any State to which the Council of the League of Nations shall have communicated a copy of the Convention for this purpose.

Article 34.

The present Convention is subject to ratification. The instruments of ratification shall be deposited with the Secretary-General of the League of Nations, who shall notify their receipt to the Members of the League which are signatories of the Convention and to the other signatory States.

Article 35.

After the 30th day of September, 1925, the present Convention may be accepted to by any State represented at the Conference at which this Convention was drawn up and which has not signed the Convention, by any Member of the League of Nations, or by any State to which the Council of the League of Nations shall have communicated a copy of the Convention for this purpose.

Accession shall be effected by an instrument communicated to the Secretary-General of the League of Nations to be deposited in the archives of the Secretariat. The Secretary-General shall at once notify such deposit to all the Members of the League of Nations signatories of the Convention and to the other signatory States.

Article 36.

The present Convention shall not come into force until it has been ratified by ten Powers, including seven of the States by which the Central Board is to be appointed in pursuance of Article 19, of which at least two must be permanent Members of the Council of the League. The date of its coming into force shall be the ninetieth day after the receipt by the Secretary-General of the League of Nations of the last of the necessary ratifications. Thereafter, the present Convention will take effect in the case of each Party ninety days after the receipt of its ratification or of the notification of its accession.

In compliance with the provisions of Article 18 of the Covenant of the League of Nations, the Secretary-General will register the present Convention upon the day of its coming into force.

Article 37.

A special record shall be kept by the Secretary-General of the League of Nations showing which of the Parties have signed, ratified, acceded to or denounced the present Convention. This record shall be open to the Contracting Parties and the Members of the League at all times; it shall be published as often as possible, in accordance with the directions of the Council.

Article 38.

The present Convention may be denounced by an instrument in writing addressed to the Secretary-General of the League of Nations. The denunciation shall become effective one year after the date of the receipt of the instrument of denunciation by the Secretary-General, and shall operate only in respect of the Contracting Party which makes it.

The Secretary-General of the League of Nations shall notify the receipt of any such denunciations to all Members of the League of Nations signatories of or adherents to the Convention and to the other signatory or adherent States.

Article 39.

Any State signing or acceding to the present Convention may declare, at the moment either of its signature, ratification or accession, that its acceptance of the present Convention does not include any or all of its colonies, overseas possessions, protectorates, or overseas territories under its sovereignty or authority, or in respect of which it has accepted a mandate on behalf of the League of Nations, and may subsequently

accede, in conformity with the provisions of Article 35, on behalf of any such colony, overseas possession, protectorate or territory excluded by such declaration.

Denunciation may also be made separately in respect of any such colony, overseas possession, protectorate or territory, and the provisions of Article 38 shall apply to any such denunciation.

In faith whereof the above-named Plenipotentiaries have signed the present Convention.

Done at Geneva, the nineteenth day of February, one thousand nine hundred and twenty-five, in a single copy, which will remain deposited in the archives of the Secretariat of the League of Nations; certified copies will be transmitted to all the States represented at the Conference and to all Members of the League of Nations.

For Albania:

B. BLINISHTI.

For Germany:

H. VON ECKARDT.

Subject to the reservation annexed to the Proces-verbal of the plenary, meeting of February 16th, 1925.

For Belgium:

FERNAND PELTZER.

DR. FERD. DE. MYTTENAERE.

For British Empire:

MALCOLM DELEVINGNE.

For Australia:

M. L. SHEPHERD.

For France:

G. BOURGOIS.

A. KIRCHER.

The French Government is compelled to make all reservations, as regards the colonies, protectorates and mandated territories under its authority, as to the possibility of regularly producing, within the strictly prescribed time limit, the quarterly statistics provided for in paragraph 2 of Article 22.

For Greece:

Ad referendum VASSILI DENDRAMIS.

For Japan:

S. KAKU.

Y. SUGIMURA.

For Luxemburg:

Ch. G. VERMAIRE.

For Netherlands:

V. WETTUM.

J. B. M. COEBERGH.

A. D. A. de KAT ANGELINO.

For Persia:

PRINCE ARFA-ED-DOVLEH MIRZA RIZĀ KHAN.

Ad referendum and subject to the League of Nations complying with the request made by Persia in the Memorandum O. D. C. 24.

For Poland:

CHODZKO.

For Portugal:

A. M. BARTHOLOMEU FERREIRA.

R. J. RODRIGUES.

For Siam:

DAMRAS.

Annex.

MODEL FORM OF IMPORT CERTIFICATE.

INTERNATIONAL OPIUM CONVENTION.

Certificate of Official Approval of Import.

No.

I hereby certify that the Ministry of.....being the Ministry charged with the administration of the law relating to the dangerous drugs to which the International Opium Convention of ( ) applies, has approved the importation by

(*a*) Name, address and business of importer.

(*a*) .....

(*b*) Exact description and amount of drug to be imported.

of (*b*) .....

(*c*) Name and address of firm in exporting country from which the drug is to be obtained.

from (*c*) .....

subject to the following conditions

(*d*) State any special conditions to be observed, *e.g.*, not to be imported through the post.

(*d*) .....

and is satisfied that the consignment proposed to be imported is required:

(1) For legitimate purposes (in the case of raw opium and the coca leaf)*;

(2) Solely for medicinal or scientific purposes (in the case of drugs to which Chapter III of the Convention applies and Indian hemp).

Signed on behalf of the Ministry of.....

(Signature).....

(Official Rank).....

(Date).....

* Where the use of prepared opium has not yet been suppressed and it is desired to import raw opium for the manufacture of prepared opium, the certificate should be to the effect that the raw opium to be imported is required for the purpose of manufacturing prepared opium for use under Government restrictions pending complete suppression and that it will not be re-exported

PROTOCOL.

The undersigned, representatives of certain States signatory to the Convention relating to Dangerous Drugs signed this day, duly authorised to that effect;

Taking note of the Protocol signed the eleventh day of February one thousand nine hundred and twenty-five by the representatives of the States signatory to the Agreement signed on the same day relating to the Use of Prepared Opium:

Hereby agree as follows:

I.

The States signatory to the present Protocol, recognising that under Chapter I of the Hague Convention the duty rests upon them of establishing such a control over the production, distribution and exportation of raw opium as would prevent the illicit traffic, agree to take such measures as may be required to prevent completely, within five years from the present date, the smuggling of opium from constituting a serious obstacle to the effective suppression of the use of prepared opium in those territories where such use is temporarily authorised.

II.

The question whether the undertaking referred to in Article I has been completely executed shall be decided, at the end of the said period of five years, by a Commission to be appointed by the Council of the League of Nations.

III.

The present Protocol shall come into force for each of the signatory States at the same time as the Convention relating to Dangerous Drugs signed this day. Articles 33 and 35 of the Convention are applicable to the present Protocol.

In faith whereof the present Protocol was drawn up at Geneva the nineteenth day of February 1925, in a single copy, which will remain deposited in the archives of the Secretariat of the League of Nations; certified copies will be transmitted to all States represented at the Conference and to all Members of the League of Nations.

For Albania:

B. BLINISHTI.

For Germany:

H. VON ECKARDT.

For British Empire:

MALCOLM DELEVINGNE.

For Australia:

M. L. SHEPHERD.

For Greece:

Ad referendum.

VASSILI DENDRAMIS.

For Japan:

S. KAKU.

Y. SUGIMURA.

For Luxemburg:

CH. G. VERMAIRE.

For Netherlands:

v. WETTUM.

J. B. M. COEBERGH.

A. D. A. DE KAT ANGELINO.

For Persia:

PRINCE ARFA-ED-DOVLEH MIRZA RIZA KHAN.

For Portugal:

A. M. BARTHOLOMEU FERREIRA.

R. J. RODRIGUES.

For Siam:

DAMRAS.

FINAL ACT.

The Second International Opium Conference, convoked in accordance with the resolution of the Assembly of the League of Nations dated September 27th, 1923, met on November 17th, 1924, at the Palais des Nations, Geneva.

The resolution of the Assembly was in the following terms:

"The Assembly, having noted with satisfaction that, in accordance with the hope expressed in the fourth resolution adopted by the Assembly in 1922, the Advisory Committee has reported that the information now available makes it possible for the Governments concerned to examine, with a view to the conclusion of an agreement, the question of the limitation of the amounts of morphine, heroin or cocaine and their respective salts to be manufactured; of the limitation of the amounts of raw opium and the coca leaf to be imported for that purpose and for other medicinal and scientific purposes; and of the limitation of the production of raw opium and the coca leaf for export to the amount required for such medicinal and scientific purposes, requests the Council—as a means of giving effect to the principles submitted by the representatives of the United States of America, and to the policy which the League, on the recommendation of the Advisory Committee, has adopted—to invite the Governments concerned to send representatives with plenipotentiary powers to a conference for this purpose, to be held, if possible, immediately after the conference mentioned in Resolution V.

"The Assembly also suggests, for the consideration of the Council, the advisability of enlarging this conference so as to include all countries which are Members of the League or Parties to the Convention of 1912, with a view to securing their adhesion to the principles that may be embodied in any agreement reached."

The Council of the League nominated as President of the Conference:

His Excellency M. Herluf Zahle, Envoy Extraordinary and Minister Plenipotentiary of Denmark to Berlin.

The Secretary-General of the League of Nations nominated as Secretary-General of the Conference:

Dame Rachel Crowdy.

The following States participated in the Conference, and for this purpose appointed the delegations, whose members are set out below:

ALBANIA.

Delegate:

M. Benoit Blinishti, Consul General in Switzerland; Director of the Permanent Secretariat accredited to the League of Nations.

GERMANY.

Delegates:

His Excellency M. H. von Eckardt, Envoy Extraordinary and Minister Plenipotentiary.

M. G. Aschmann, Consul-General at Geneva.

Doctor Anselmino, Senior Government Counsellor at the Health Department of the Reich.

UNITED STATES OF AMERICA.

Delegates:

The Honourable Stephen G. Porter, Chairman of the Committee on Foreign Affairs, House of Representatives.

The Right Reverend Charles H. Brent, Bishop.

Substitute Delegates:

Mr. Rupert Blue, Assistant Surgeon-General.

Mrs. Hamilton Wright.

Mr. Edwin L. Neville.

AUSTRALIA

Delegate:

Mr. M. L. Shepherd, I.S.O., Official Secretary for the Commonwealth of Australia in Great Britain.

BELGIUM.

Delegates:

His Excellency M. Fernand Peltzer, Envoy Extraordinary and Minister Plenipotentiary in Switzerland.

Doctor F. De Myttenaere, Chief Inspector of Pharmacies.

BOLIVIA.

Delegate:

Doctor Arturo Pinto-Escalier, First Secretary of the Bolivian Legation in France.

BRAZIL.

Delegates:

Doctor Humberto Gottuzo, Medical Director of the Rio de Janeiro Mental Hospital.

Doctor Pedro Pernambuco, Professor in the Faculty of Medicine at the University of Rio de Janeiro.

BRITISH EMPIRE.

Delegates:

The Rt. Hon. Viscount Cecil of Chelwood, K.C.

Sir Malcolm Delevingne, K.C.B., Assistant Under-Secretary of State.

Experts:

Mr. G. D. Kirwan, Home Office.

Mr. M. D. Perrins, Home Office.

Mr. H. W. Malkin, C.B., Assistant Legal Adviser to the Foreign Office.

BULGARIA.

Delegate:

M. Dimitri Mikoff, Chargé d'Affaires in Switzerland.

CANADA.

Delegates:

The Honourable Henri S. Beland, B.A., M.D., Member of the King's Privy Council, Minister of Health, Minister of Soldier Civil Re-establishment.

Doctor J. A. Amyot, Deputy Minister of Health.

Doctor W. A. Riddell, Ph. D., Advisory Officer of the Dominion of Canada for the League of Nations.

CHILE.

Delegate:

Doctor Eugène Suarez-Herreros.

CHINA.

Delegates:

His Excellency M. Sao-Ke Alfred Sze, Ambassador Extraordinary and Minister Plenipotentiary at Washington.

His Excellency M. Wang Kouang Ky, Envoy Extraordinary and Minister Plenipotentiary at The Hague.

His Excellency M. Chao-Hsin Chu, Minister Plenipotentiary; Chargé d'Affaires in London.

Counsellor and Expert:

Professor Dr. W. W. Willoughby, Professor Political Science at the Johns Hopkins University.

Experts:

Doctor Venfour Tchou, Secretary of the Chinese Legation at Washington.

M. Tchou Che-Tsien, Secretary of the Chinese Legation in Paris.

M. William Hsieh, Secretary of the Chinese Legation at The Hague.

Doctor Telly Koo, Secretary at the Ministry for Foreign Affairs.

CUBA.

Delegate:

His Excellency Doctor Aristides de Aguero y Bethancourt, Envoy Extraordinary and Minister Plenipotentiary at Berlin and Vienna.

DENMARK.

Delegate:

His Excellency M. Andreas Oldenburg, Envoy Extraordinary and Minister Plenipotentiary in Switzerland; Representative of the Royal Government accredited to the League of Nations.

FREE CITY OF DANZIG.*

Delegate:

Doctor W. Chodzko, Former Minister of Health: Delegate of the Polish Government to the Office international d'Hygiène.

Expert:

Doctor Karl Stade, Councillor of State; Head of the Health Administration at Danzig.

DOMINICAN REPUBLIC.

Delegate:

Doctor L. M. Betances, Doctor of Medicine and Science; Biologist at the Embryology Laboratory of the Collège de France.

EGYPT

Delegate:

Doctor Mohamed Abdel Salam El Guindy, Secretary of the Royal Egyptian Legation at Paris and Brussels; Delegate of the Egyptian Government at the "Office international d'Hygiène."

Substitute Delegates:

Doctor A. H. Mahfouz Bey, Assistant Director of the Government General Hospitals, Public Health Department, Cairo.

Mohamed Kamel Bey, Assistant Director of the Ministry of Agriculture.

SPAIN.

Delegates:

His Excellency M. Emilio de Palacios, Envoy Extraordinary and Minister Plenipotentiary in Switzerland.

Doctor Francisco Bustamante Romero, Head of the Pharmaceutical Service of the Ministry for the Interior.

Doctor Antonio Pagador y Gomez de León, Doctor of Medicine at Barcelona.

Substitute Delegate:

M. Juan de Arenzana, Consul at Geneva.

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* The Delegation of the Free City withdrew before the end of the Conference.

FINLAND.

Delegate:

M. Urho Toivola, Secretary of Legation; Director of the Finnish Secretariat accredited to the League of Nations.

FRANCE.

Delegates:

His Excellency M. Daladier, Minister of the Colonies.

His Excellency M. Clinchant, Minister Plenipotentiary; Assistant Director for Asia at the Ministry for Foreign Affairs.

Assistant Delegates:

M. Douchêne, Director of Political Affairs at the Ministry for the Colonies.

M. Kircher, Director of Customs and Excise in Indo-China.

M. Perrot, Inspector of Pharmacies; Professor and Vice-Doyen of the Pharmacy Faculty of Paris.

M. Bourgois, Consul.

Expert:

M. Chéron, Colonial Administrator.

GREECE.

Delegate:

M. Vassili Dendramis Chargé d'Affaires at Berne.

Expert:

Professor Em. J. Emmanuel, Professor of Pharmaceutical Chemistry at the University of Athens; Member of the Supreme Council of Public Health, Greece.

HUNGARY.

Delegate:

M. Zoltán Baranyai, Director of the Royal Hungarian Secretariat accredited to the League of Nations.

INDIA.

Delegates:

Mr. J. Campbell, C.S.I., O.B.E., I.C.S. (retired).

Mr. H. Clayton, C.I.E., I.C.S.

Mr. J. C. Walton.

Expert:

Mr. G. A. Levett Yeats, C.I.E., I.S.O., V.D.

IRISH FREE STATE.

Delegate:

Mr. Michael MacWhite, Representative of the Irish Free State accredited to the League of Nations.

ITALY.

Delegates:

His Excellency M. Alfredo Falcioni, Former Minister for Justice.

Professor Comm. Pietro Spica, Director of the Institute of Pharmaceutical Chemistry at the University of Padua.

JAPAN.

Delegates:

Mr. Sagataro Kaku, Former Civil Governor of the Government General of Taiwan.

M. Yotaro Sugimura, Counsellor of Embassy; Assistant Head of the Imperial Japanese Bureau to the League of Nations.

Experts:

Doctor Mikinosuke Miyajima.

Doctor Mitsuzo Tsurumi.

LUXEMBURG,

Delegate:

M. Charles Vermaire, Consul at Geneva.

NICARAGUA.

Delegate:

Doctor Sottile, Consul at Geneva.

NETHERLANDS.

Delegates:

His Excellency le Jonkheer J Loudon, Doctor of Political Science; Envoy Extraordinary and Minister Plenipotentiary in France.

M. W. G. van Wettum, Chairman of the Advisory Committee of the League of Nations on the Traffic in Opium and Other Dangerous Drugs.

Dr. J. B. M. Coebergh, Chief Inspector, Public Health Service.

M. A. D. A. de Kat Angelino, Secretary for Chinese Affairs to the Government of the Dutch Indies.

Expert:

M. H. van Ebbenhorst Tengbergen.

PERSIA.

Delegate:

His Highness Prince Mirza Riza Khan Arfa-ed-Dowleh, Ambassador; Former Minister for Justice.

POLAND.

Delegate:

Doctor W. Chodzko, Former Minister of Health; Delegate of the Polish Government to the Office international d'Hygiène.

PORTUGAL.

Delegates:

His Excellency M. Bartholomeu Ferreira, Envoy Extraordinary and Minister Plenipotentiary in Switzerland.

His Excellency Doctor Rodrigo Rodrigues, Governor of Macao.

ROUMANIA.

Delegate:

His Excellency M. N. P. Comnene, Envoy Extraordinary and Minister Plenipotentiary in Switzerland.

Substitute Delegates:

M. E. Timciuc, Consul-General.

M. D. Moriaud, Vice-Consul at Geneva.

KINGDOM OF THE SERBS, CROATS AND SLOVENES.

Delegates:

His Excellency M. M. Jovonivitch, Envoy Extraordinary and Minister Plenipotentiary in Switzerland.

M. Milivoyo Pilya, Inspector at the Board of Trade.

Expert:

M. Dragan Militchevitch, Secretary to the Confederation of Industrial Corporations of the Kingdom of the Serbs, Croats and Slovenes.

SIAM.

Delegates:

His Highness Prince Charoon, Envoy Extraordinary and Minister Plenipotentiary in France.

His Serene Highness Prince Damras, Chargé d'Affaires at The Hague.

SWEDEN.

Delegate:

Doctor Erik Rudolf Sjöstrand, Adviser for Social Questions, in residence at Geneva.

SWITZERLAND.

Delegates:

M. Dinichert, Minister Plenipotentiary; Head of the Foreign Affairs Division of the Federal Political Department.

Doctor Carrière, Head of the Federal Public Health Service.

M. Péquignot, Assistant Head to the Commercial Division of the Department for Public Economy.

M. Hulftegger, First Secretary at the Directorate of the Swiss Union of Commerce and Industry.

Expert:

M. Secretan, Secretary at the Foreign Affairs Department of the Federal Political Department.

CZECHOSLOVAKIA.

Delegate:

His Excellency M. F. Veverka, Envoy Extraordinary and Minister Plenipotentiary in Switzerland; Permanent Delegate accredited to the League of Nations

Substitute Delegate:

M. Jean Reisser, First Secretary of Legation.

TURKEY.

Delegates:

Mehmed Sureya Bey, Under-Secretary of State at the Ministry of Agriculture.

Professor Nouriddin Bey, Professor of Agricultural Chemistry at the School of Agriculture of Constantinople.

URUGUAY.

Delegate:

His Excellency M. Enrique Buero, Envoy Extraordinary and Minister Plenipotentiary in Switzerland.

VENEZUELA.

Delegate:

Doctor Francisco J. Duarte, Consul at Geneva.

The Conference held meetings between November 17th, 1924, and February 19th, 1925.

The Conference adopted the Convention relating to Dangerous Drugs which bears to-day's date.

The Conference also adopted the Protocol bearing to-day's date.

The Conference also adopted the following resolutions:

1.

The Conference recognises that, to enable the Convention relating to Dangerous Drugs, signed this day to produce its full effect, it is essential that it should be applied as widely as possible in the colonies, possessions, protectorates and territories mentioned in Article 39 of the Convention. The Conference accordingly expresses the earnest hope that the Governments concerned will take the necessary steps to that end with as little delay as possible, and that the number of such colonies, possessions, protectorates or territories excluded from the operation of the Convention may be reduced to a minimum.

II.

The Conference recommends that each Government should consider the possibility of forbidding the conveyance in any ship sailing under its flag of any consignment of the substances covered by the Convention:

(1) Unless an export authorisation has been issued in respect of such consignment in accordance with the provisions of the Convention, and the consignment is accompanied by an official copy of such authorisation, or of any diversion certificate which may be issued;

(2) To any destination other than the destination mentioned in the export authorisation or diversion certificate.

III.

The Conference recommends that all States should co-operate as closely as possible with one another in the suppression of the illicit traffic, and that they should authorise the competent authorities charged with the administration of the law on the subject to communicate directly with the corresponding authorities in other countries.

IV.

The Conference draws attention to the advisability in certain cases of requiring dealers who are licensed by the Government to trade in the substances covered by the Convention to deposit or give sureties for a sum of money sufficient to serve as an effective guarantee against their engaging in the illicit traffic.

V.

The Conference asks the Council of the League of Nations to examine the suggestion which has been made in the course of its proceedings, in particular by the Persian delegation, that a commission should be appointed to visit certain opium-producing countries, should those countries so desire, for the purpose of making a careful study (in collaboration with the Governments of those countries) of the difficulties connected with the limitation of the production of opium in those countries and advising as to the measures which could be taken to make it possible to limit the production of opium in those countries to the quantities required for medical and scientific purposes.

VI.

The Conference asks the Council of the League of Nations to invite the Health Committee to consider immediately whether it would be expedient to consult the International Health Office regarding the products mentioned in Articles 8 and 10, in order that, if so, a decision concerning preparations which cannot give rise to the drug habit and recommendation concerning all other drugs which might come under the provisions of the Convention may be notified immediately upon the entry into force of the said Convention.

VII.

The Conference requests the Council of the League of Nations to decide to include in the expenses of the Secretariat the expenses of the Central Board and its administrative services.

It is understood that those Contracting Parties which are not Members of the League will bear their share of the expenses in accordance with a scale to be drawn up by agreement with the Council.

At the moment of signing the present Act, the delegate of Persia made the following declaration:

> "The Persian Delegate, acting on instructions from his Government, declares that he signs the Convention *ad referendum* and subject to the League of Nations acceding to Persia's request as set forth in its memorandum."

At the moment of signing the present Act, the delegate of Siam made the following declaration:

> "In signing the Convention and the present Final Act, the Siamese delegation wishes to declare that, having no instructions on the subject of Indian hemp, which was not originally on the agenda of the Conference, the Siamese delegation is obliged to make reservation of Chapter III in regard to galenical preparations of Indian hemp and of Chapters IV and V solely in regard to Indian hemp."

In faith whereof the delegates have signed the present Act.

Done at Geneva, the nineteenth day of February one thousand nine hundred and twenty-five, in a single copy, which shall be deposited in the archives of the Secretariat of the League of Nations and of which authenticated copies shall be delivered to all States represented at the Conference.

Delegates:

The President:
HERLUF ZAHLE.

The Secretary-General:
RACHEL E. CROWDY.

For Albania:
B. BLINISHTI.

For Germany:
H. von ECKARDT.
GOTTFRIED ASCHMANN.

For Australia:
M. L. SHEPHERD.

For Belgium:
FERNAND PELTZER.
Dr. FERD De MYTTENAERE.

For Bolivia:
ARTURO PINTO-ESCALIER.

For British Empire:
MALCOLM DELEVINGNE.

For Spain:
EMILIO DE PALACIOS.

For France:
G. BOURGOIS.
A. KIRCHER.

For Greece:
VASSILI DENDRAMIS.

For Hungary:
DE BARANYAI SOLTAN.

For Japan:
S. KAKU.
Y. SUGIMURA.

For Luxemburg:
CH. G. VERMAIRE.

For Netherlands:
V. WETTUM.
J. B. M. COEBERGH.
A. D. A. DE KAT ANGELINO.

For Persia:
PRINCE ARFA-ED-DOVLEH MIRZA RIZA KHAN.

For Poland:
CHODZKO.

For Portugal:
A. M. BARTHOLOMEU FERREIRA.
R. J. RODRIGUES.

For Siam:
DAMRAS.

International Convention for Limiting the Mnaufacture and Regulating the Distribution of Narcotic Drugs.

Geneva, July 13, 1931.

[*The Signatories.*]

DESIRING to supplement the provisions of the International Opium Conventions, signed at The Hague on the 23rd January, 1912, and at Geneva on the 19th February, 1925, by rendering effective by international agreement the limitation of the manufacture of narcotic drugs to the world's legitimate requirements for medical and scientific purposes and by regulating their distribution,

Have resolved to conclude a Convention for that purpose and have appointed as their Plenipotentiaries:

[*Here follow the names.*]

Who, having communicated to one another their full powers, found in good and due form, have agreed as follows:

Chapter I.—*Definitions.*

Article 1.

Except where otherwise expressly indicated, the following definitions shall apply throughout this Convention:

1. The term "Geneva Convention" shall denote the International Opium Convention signed at Geneva on the 19th February, 1925.*

2. The term "the drugs" shall denote the following drugs whether partly manufactured or completely refined:

Group I.

Sub-group (a):

(i) Morphine and its salts, including preparations made directly from raw or medicinal opium and containing more than 20 per cent. of morphine;

(ii) Diacetylmorphine and the other esters of morphine and their salts;

(iii) Cocaine and its salts, including preparations made direct from the coca leaf and containing more than 0·1 per cent. of cocaine, all the esters of ecgonine and their salts;

* See "Treaty Series No. 27 (1928)", Cmd. 3244.

(iv) Dihydrohydrooxycodeinone (of which the substance registered under the name of eucodal is a salt); dihydrocodeinone (of which the substance registered under the name of dicodide is a salt), dihydromorphinone (of which the substance registered under the name of dilaudide is a salt), acetyldihydrocodeinone or acetyldemethylodihydrothebaine (of which the substance registered under the name of acedicone is a salt); dihydromorphine (of which the substance registered under the name of paramorfan is a salt), their esters and the salts of any of these substances and of their esters, morphine-N-oxide (registered trade name genomorphine), also the morphine-N-oxide derivatives, and the other pentavalent nitrogen morphine derivatives.

Sub-group (b):

Ecgonine, thebaine and their salts, benzylmorphine and the other ethers of morphine, and their salts, except methylmorphine (codeine), ethylmorphine and their salts.

Group II.

Methylmorphine (codeine), ethylmorphine and their salts.

The substances mentioned in this paragraph shall be considered as drugs even if produced by a synthetic process.

The terms "Group I" and "Group II" shall respectively denote Groups I and II of this paragraph.

3. "Raw opium" means the spontaneously coagulated juice obtained from the capsules of the *Papaver somniferum L.*, which has only been submited to the necessary manipulations for packing and transport, whatever its content of morphine.

"Medicinal opium" means raw opium which has undergone the processes necessary to adapt it for medicinal use in accordance with the requirements of the national pharmacopœia, whether in powder form or granulated or otherwise or mixed with neutral materials.

"Morphine" means the principal alkaloid of opium having the chemical formula $C_{17}\ H_{19}\ O_3\ N$.

"Diacetylmorphine" means diacetylmorphine (diamorphine, heroin) having the formula $C_{21}\ H_{23}\ O_5\ N\ (C_{17}\ H_{17}\ (C_2\ H_3\ O)_2\ O_3\ N)$.

"Coca leaf" means the leaf of the *Erythroxylon Coca* Lamarck and the *Erythroxylon novogranatense* (Morris) *Hieronymus* and their varieties, belonging to the family of Erythroxylaceæ and the leaf of other species of this genus from which it may be found possible to extract cocaine, either directly or by chemical transformation.

"Cocaine" means methyl-benzoyl laevo-ecgonine ($[\alpha]$ D 20° = —16°4) in 20 per cent. solution of chloroform of which the formula is $C_{17}\ H_{21}\ O_4\ N$.

"Ecgonine" means laevo-ecgonine ($[\alpha]$ D20° = — 45°6 in 5 per cent. solution of water), of which the formula is $C_9\ H_{15}\ O_3\ N.\ H_2\ O$ and all the derivatives of laevo-ecgonine which might serve industrially for its recovery.

The following drugs are defined by their chemical formulæ as set out below:—

Dihydrohydrooxycodeinone	$C_{18}H_{21}O_4N$	
Dihydrocodeinone	$C_{18}H_{21}O_3N$	
Dihydromorphinone	$C_{17}H_{19}O_3N$	
Acetyldihydrocodeinone or Acetyldemethylodihydrothebaine	$C_{20}H_{23}O_4N$	$(C_{18}H_{20}(C_2H_3O)O_3N)$
Dihydromorphine	$C_{17}H_{21}O_3N$	
Morphine-N-Oxide	$C_{17}H_{19}O_4N$	
Thebaine	$C_{19}H_{21}O_3N$	
Methylmorphine (codeine)	$C_{18}H_{21}O_3N$	$(C_{17}H_{18}(CH_3O)O_2N)$
Ethylmorphine	$C_{19}H_{23}O_3N$	$(C_{17}H_{18}(C_2H_5O)O_2N)$
Benzylmorphine	$C_{24}H_{25}O_3N$	$(C_{17}H_{18}(C_7H_7O)O_2N)$

4. The term "manufacture" shall include any process of refining.

The term "conversion" shall denote the transformation of a drug by a chemical process, with the exception of the transformation of alkaloids into their salts.

When one of the drugs is converted into another of the drugs this operation shall be considered as conversion in relation to the first-mentioned drug and as manufacture in relation to the other.

The term "estimates" shall denote estimates furnished in accordance with Articles 2 to 5 of this Convention and, unless the context otherwise requires, shall include supplementary estimates.

The term "reserve stocks" in relation to any of the drugs shall denote the stocks required—

(i) For the normal domestic consumption of the country or territory in which they are maintained,

(ii) For conversion in that country or territory, and

(iii) For export.

The term "Government stocks" in relation to any of the drugs shall denote stocks kept under Government control for the use of the Government and to meet exceptional circumstances.

Except where the context otherwise requires, the term "export" shall be deemed to include re-export.

Chapter II.—*Estimates.*

Article 2.

1. Each High Contracting Party shall furnish annually, for each of the drugs in respect of each of his territories to which this Convention applies, to the Permanent Central Board, constituted under Chapter VI of the Geneva Convention, estimates in accordance with the provisions of Article 5 of this Convention.

2. In the event of any High Contracting Party failing to furnish, by the date specified in paragraph 4 of Article 5, an estimate in respect of any of his territories to which this Convention applies, an estimate will, so far as possible, be furnished by the Supervisory Body specified in paragraph 6 of Article 5.

3. The Permanent Central Board shall request estimates for countries or territories to which this Convention does not apply to be made in accordance with the provisions of this Convention. If for any such country estimates are not furnished, the Supervisory Body shall itself, as far as possible, make the estimate.

Article 3.

Any High Contracting Party may, if necessary, in any year furnish in respect of any of his territories supplementary estimates for that territory for that year with an explanation of the circumstances which necessitate such supplementary estimates.

Article 4.

1. Every estimate furnished in accordance with the preceding Articles, so far as it relates to any of the drugs required for domestic consumption in the country or territory in respect of which it is made, shall be based solely on the medical and scientific requirements of that country or territory.

2. The High Contracting Parties may, in addition to reserve stocks, create and maintain Government stocks.

Article 5.

1. Each estimate provided for in Articles 2 to 4 of this Convention shall be in the form from time to time prescribed by the Permanent Central Board and communicated by the Board to all the Members of the League of Nations and to the non-member States mentioned in Article 27.

2. Every estimate shall show for each country or territory for each year in respect of each of the drugs whether in the form of the alkaloid or salts or of preparations of the alkaloids or salts:

(*a*) The quantity necessary for use as such for medical and scientific needs, including the quantity required for the manufacture of preparations for the export of which export authorisations are not required, whether such preparations are intended for domestic consumption or for export;

(*b*) The quantity necessary for the purpose of conversion, whether for domestic consumption or for export;

(*c*) The amount of the reserve stocks which it is desired to maintain;

(*d*) The quantity required for the establishment and maintenance of any Government stocks as provided for in Article 4.

The total of the estimates for each country or territory shall consist of the sum of the amounts specified under (*a*) and (*b*) of this paragraph with the addition of any amounts which may be necessary to bring the reserve stocks and the Government stocks up to the desired level, or after deduction of any amounts by which those stocks may exceed that level. These additions or deductions shall, however, not be taken into account

except in so far as the High Contracting Parties concerned shall have forwarded in due course the necessary estimates to the Permanent Central Board.

3. Every estimate shall be accompanied by a statement explaining the method by which the several amounts shown in it have been calculated. If these amounts are calculated so as to include a margin allowing for possible fluctuations in demand, the estimates must indicate the extent of the margin so included. It is understood that in the case of any of the drugs which are or may be included in Group II, a wider margin may be necessary than in the case of the other drugs.

4. Every estimate shall reach the Permanent Central Board not later than the 1st August in the year preceding that in respect of which the estimate is made.

5. Supplementary estimates shall be sent to the Permanent Central Board immediately on their completion.

6. The estimates will be examined by a Supervisory Body. The Advisory Committee on the Traffic in Opium and other Dangerous Drugs of the League of Nations, the Permanent Central Board, the Health Committee of the League of Nations and the Office international d'Hygiène publique shall each have the right to appoint one member of this Body. The Secretariat of the Supervisory Body shall be provided by the Secretary-General of the League of Nations, who will ensure close collaboration with the Permanent Central Board.

The Supervisory Body may require any further information or details, except as regards requirements for Government purposes, which it may consider necessary, in respect of any country or territory on behalf of which an estimate has been furnished in order to make the estimate complete or to explain any statement made therein, and may, with the consent of the Government concerned, amend any estimate in accordance with any information or details so obtained. It is understood that in the case of any of the drugs which are or may be included in Group II, a summary statement shall be sufficient.

7. After examination by the Supervisory Body as provided in paragraph 6 above of the estimates furnished, and after the determination by that Body as provided in Article 2 of the estimates for each country or territory on behalf of which no estimates have been furnished, the Supervisory Body shall forward, not later than the 1st November in each year, through the intermediary of the Secretary-General, to all the Members of the League of Nations and non-member States referred to in Article 27, a statement containing the estimates for each country or territory, and, so far as the Supervisory Body may consider necessary, an account of any explanations given or required in accordance with paragraph 6 above, and any observations which the Supervisory Body may desire to make in respect of any such estimate or explanation, or request for an explanation.

8. Every supplementary estimate sent to the Permanent Central Board in the course of the year shall be dealt with without delay by the Supervisory Body in accordance with the procedure specified in paragraphs 6 and 7 above.

Chapter III.—*Limitation of Manufacture.*

Article 6.

1. There shall not be manufactured in any country or territory in any one year a quantity of any of the drugs greater than the total of the following quantities:—

(*a*) The quantity required within the limits of the estimates for that country or territory for that year for use as such for its medical and scientific needs, including the quantity required for the manufacture of preparations for the export of which export authorisations are not required, whether such preparations are intended for domestic consumption or for export;

(*b*) The quantity required within the limits of the estimates for that country or territory for that year for conversion, whether for domestic consumption or for export;

(*c*) Such quantity as may be required by that country or territory for the execution during the year of orders for export in accordance with the provisions of this Convention;

(*d*) The quantity, if any, required by that country or territory for the purpose of maintaining the reserve stocks at the level specified in the estimates for that year;

(*e*) The quantity, if any, required for the purpose of maintaining the Government stocks at the level specified in the estimates for that year.

2. It is understood that, if at the end of any year, any High Contracting Party finds that the amount manufactured exceeds the total of the amounts specified above, less any deductions made under Article 7, paragraph 1, such excess shall be deducted from the amount to be manufactured during the following year. In forwarding their annual statistics to the Permanent Central Board, the High Contracting Parties shall give the reasons for any such excess.

Article 7.

There shall be deducted from the total quantity of each drug permitted under Article 6 to be manufactured in any country or territory during any one year—

(i) Any amounts of that drug imported, including any returned deliveries of the drug, less quantities re-exported.

(ii) Any amounts of the drug seized and utilized as such for domestic consumption or for conversion.

If it should be impossible to make any of the above deductions during the course of the current year, any amounts remaining in excess at the end of the year shall be deducted from the estimates for the following year.

Article 8.

The full amount of any of the drugs imported into or manufactured in any country or territory for the purpose of conversion in accordance with the estimates for that country or territory shall, if possible, be utilised for that purpose within the period for which the estimate applies.

In the event, however, of it being impossible to utilise the full amount for that purpose within the period in question, the portion remaining unused at the end of the year shall be deducted from the estimates for that country or territory for the following year.

Article 9.

If at the moment when all the provisions of the Convention shall have come into force, the then existing stocks of any of the drugs in any country or territory exceeds the amount of the reserve stocks of that drug, which, according to the estimates for that country or territory, it is desired to maintain, such excess shall be deducted from the quantity which, during the year, could ordinarily be imported or manufactured as the case may be under the provisions of this Convention.

Alternatively, the excess stocks existing at the moment when all the provisions of the Convention shall have come into force shall be taken possession of by the Government and released from time to time in such quantities only as may be in conformity with the present convention. Any quantities so released during any year shall be deducted from the total amount to be manufactured or imported as the case may be during that year.

Chapter IV.—*Prohibitions and Restrictions.*

Article 10.

1. The High Contracting Parties shall prohibit the export from their territories of diacetylmorphine, its salts, and preparations containing diacetylmorphine, or its salts.

2. Nevertheless, on the receipt of a request from the Government of any country in which diacetylmorphine is not manufactured, any High Contracting Party may authorise the export to that country of such quantities of diacetylmorphine, its salts, and preparations containing diacetylmorphine, or its salts, as are necessary for the medical and scientific needs of that country, provided that the request is accompanied by an import certificate and is consigned to the Government Department indicated in the certificate.

3. Any quantities so imported shall be distributed by and on the responsibility of the Government of the importing country.

Article 11.

1. No trade in or manufacture for trade of any product obtained from any of the phenanthrene alkaloids of opium or from the ecgonine alkaloids of the coca leaf, not in use on this day's date for medical or scientific purposes shall take place in any country or territory unless and until it has been ascertained to the satisfaction of the Government concerned that the product in question is of medical or scientific value.

In this case (unless the Government determines that such product is not capable of producing addiction or of conversion into a product capable of producing addiction) the quantities permitted to be manufactured, pending the decision hereinafter referred to, shall not exceed,

the total of the domestic requirements of the country or territory for medical and scientific needs, and the quantity required for export orders and the provisions of this Convention shall apply.

2. Any High Contracting Party permitting trade in or manufacture for trade of any such product to be commenced, shall immediately send a notification to that effect to the Secretary-General of the League of Nations, who shall advise the other High Contracting Parties and the Health Committee of the League.

3. The Health Committee will thereupon, after consulting the Permanent Committee of the Office international d'Hygiéne publique, decide whether the product in question is capable of producing addiction [and is in consequence assimilable to the drugs mentioned in Sub-group (*a*) of Group I], or whether it is convertible into such a drug [and is in consequence assimilable to the drugs mentioned in Sub-group (*b*) of Group I or in Group II.].

4. In the event of the Health Committee deciding that the product is not itself a drug capable of producing addiction, but is convertible into such a drug, the question whether the drug in question shall fall under Sub-group (*b*) of Group I or under Group II shall be referred for decision to a body of three experts competent to deal with the scientific and technical aspects of the matter, of whom one member shall be selected by the Government concerned, one by the Opium Advisory Committee of the League, and the third by the two members so selected.

5. Any decisions arrived at in accordance with the two preceding paragraphs shall be notified to the Secretary-General of the League of Nations, who will communicate it to all the Members of the League and to the non-member States mentioned in Article 27.

6. If the decisions are to the effect that the product in question is capable of producing addiction or is convertible into a drug capable of producing addiction, the High Contracting Parties will, upon receipt of the communication from the Secretary-General, apply to the drug the appropriate régime laid down in the present Convention according as to whether it falls under Group I or under Group II.

7. Any such decisions may be revised, in accordance with the foregoing procedure, in the light of further experience, on an application addressed by any High Contracting Party to the Secretary-General.

Article 12.

1. No import of any of the drugs into the territories of any High Contracting Party or export from those territories shall take place except in accordance with the provisions of this Convention.

2. The imports in any one year into any country or territory of any of the drugs shall not exceed the total of the estimates as defined in Article 5, and of the amount exported from that country or territory during the year, less the amount manufactured in that country or territory in that year.

Chapter V.—*Control.*

Article 13.

1.—(*a*) The High Contracting Parties shall apply to all the drugs in Group I the provisions of the Geneva Convention which are thereby applied to substances specified in its fourth Article (or provisions in conformity therewith). The High Contracting Parties shall also apply these provisions to preparations made from morphine and cocaine and covered by Article 4 of the Geneva Convention and to all other preparations made from the other drugs in Group I except such preparations as may be exempted from the provisions of the Geneva Convention under its eighth Article.

(*b*) The High Contracting Parties shall treat solutions or dilutions of morphine or cocaine or their salts in an inert substance, liquid or solid, which contain 0·2 per cent. or less of morphine or 0·1 per cent. or less of cocaine in the same way as preparations containing more than these percentages.

2. The High Contracting Parties shall apply to the drugs which are or may be included in Group II the following provisions of the Geneva Convention (or provisions in conformity therewith):

(*a*) The provisions of Article 6 and 7 in so far as they relate to the manufacture, import, export and wholesale trade in those drugs;

(*b*) The provisions of Chapter V, except as regards compounds containing any of these drugs which are adapted to a normal therapeutic use;

(*c*) The provisions of paragraphs 1 (*b*), (*c*) and (*e*) and paragraph 2 of Article 22, provided:

(i) That the statistics of import and export may be sent annually instead of quarterly, and

(ii) That paragraph 1 (*b*) and paragraph 2 of Article 22 shall not apply to preparations containing any of these drugs.

Article 14.

1. Any Government which has issued an authorisation for the export of any of the drugs which are or may be included in Group I to any country or territory to which neither this Convention nor the Geneva Convention applies, shall immediately notify the Permanent Central Board of the issue of the authorisation; provided that, if the request for export amounts to 5 kilogrammes or more, the authorisation shall not be issued until the Government has ascertained from the Permanent Central Board that the export will not cause the estimates for the importing country or territory to be exceeded. If the Permanent Central Board sends a notification that such an excess would be caused, the Government will not authorise the export of any amount which would have that effect.

2. If it appears from the import and export returns made to the Permanent Central Board or from the notifications made to the Board in pursuance of the preceding paragraph that the quantity exported or authorised to be exported to any country or territory exceeds the total of the estimates for that country or territory as defined in Article 5, with

the addition of the amounts shown to have been exported, the Board shall immediately notify the fact to all the High Contracting Parties, who will not, during the currency of the year in question, authorise any new exports to that country except:

(i) In the event of a supplementary estimate being furnished for that country in respect both of any quantity over-imported and of the additional quantity required; or

(ii) In exceptional cases where the export in the opinion of the Government of the exporting country is essential in the interests of humanity or for the treatment of the sick,

3. The Permanent Central Board shall each year prepare a statement showing, in respect of each country or territory for the preceding year:

(*a*) The estimates in respect of each drugs;

(*b*) The amount of each drug consumed;

(*c*) The amount of each drug manufactured;

(*d*) The amount of each drug converted;

(*e*) The amount of each drug imported;

(*f*) The amount of each drug exported;

(*g*) The amount of each drug used for the compounding of preparations, exports of which do not require export authorisations.

If such statement indicates that any High Contracting Party has or may have failed to carry out his obligations under this Convention, the Board shall have the right to ask for explanations, through the Secretary-General of the League of Nations, from that High Contracting Party, and the procedure specified in paragraphs 2 to 7 of Article 24 of the Geneva Convention shall apply in any such case.

The Board shall, as soon as possible thereafter, publish the statement above mentioned together with an account, unless it thinks it unnecessary, of any explanations given or required in accordance with the preceding paragraph, and any observations which the Board may desire to make in respect of any such explanation or request for an explanation.

The Permanent Central Board shall take all necessary measures to ensure that the statistics and other information which it receives under this Convention shall not be made public in such a manner as to facilitate the operations of speculators or to injure the legitimate commerce of any High Contracting Party.

Chapter VI.—*Administrative Provisions.*

Article 15.

The High Contracting Parties shall take all necessary legislative or other measures in order to give effect within their territories to the provisions of this Convention.

The High Contracting Parties shall, if they have not already done so, create a special administration for the purpose of:

(*a*) Applying the provisions of the prsent Convention;

(*b*) Regulating, supervising and controlling the trade in the drugs;

(*c*) Organising the campaign against drug addiction, by taking all useful steps to prevent its development and to suppress the illicit traffic.

Article 16.

1. Each High Contracting Party shall exercise a strict supervision over:

(*a*) The amounts of raw material and manufactured drugs in the possession of each manufacturer for the purpose of the manufacture or conversion of any of the drugs or otherwise;

(*b*) The quantities of drugs or preparations containing the drugs produced;

(*c*) The disposal of the drugs and preparations so produced with especial reference to deliveries from the factories.

2. No High Contracting Party shall allow the accumulation in the possession of any manufacturer of quantities or raw materials in excess of those required for the economic conduct of business, having regard to the prevailing market conditions. The amounts of raw material in the possession of any manufacturer at any one time shall not exceed the amounts required by that manufacturer for manufacture during the ensuing six months, unless the Government, after due investigation, considers that exceptional conditions warrant the accumulation of additional amounts, but in no case shall the total quantities which may be accumulated exceed one year's supply.

Article 17.

Each High Contracting Party shall require each manufacturer within his territories to submit quarterly reports stating:

(*a*) The amount of raw materials and of each of the drugs received into the factory by such manufacturer and the quantities of the drugs, or any other products whatever, produced from each of these substances. In reporting the amounts of raw materials so received, the manufacturer shall state the proportion of morphine, cocaine or ecgonine contained in or producible therefrom as determined by a method prescribed by the Government and under conditions considered satisfactory by the Government;

(*b*) The quantities of either the raw material or the products manufactured therefrom which were disposed of during the quarter;

(*c*) The quantities remaining in stock at the end of the quarter.

Each High Contracting Party shall require each wholesaler within his territories to make at the close of each year a report stating, in respect of each of the drugs, the amount of that drug contained in preparations, exported or imported during the year, for the export or import of which authorisations are not required.

Article 18.

Each High Contracting Party undertakes that any of the drugs in Group I which are seized by him in the illicit traffic shall be destroyed or converted into non-narcotic substances or appropriated for medical or scientific use, either by the Government or under its control, when these are no longer required for judicial proceedings or other action on the part of the authorities of the State. In all cases diacetylmorphine shall either be destroyed or converted.

Article 19.

The High Contracting Parties will require that the labels under which any of the drugs, or preparations containing those drugs, are offered for sale, shall show the percentage of the drugs. These labels shall also, indicate the name of the drugs as provided for in the national legislation.

Chapter VII.—*General Provisions.*

Article 20.

1. Every High Contracting Party in any of whose territories any of the drugs is being manufacutred or converted, at the time when this Convention comes into force, or in which he proposes either at that time or subsequently to authorise such manufacture or conversion, shall notify the Secretary-General of the League of Nations indicating whether the manufacture or conversion is for domestic needs only or also for export the date on which such manufacture or conversion will begin, and the drugs to be manufactured or converted, as well as the names and addresses of persons or firms authorised.

2. In the event of the manufacture or conversion of any of the drugs ceasing in the territory of any High Contracting Party, he shall notify the Secretary-General to that effect, indicating the place and date at which such manufacture or conversion has ceased or will cease and specifying the drugs affected, as well as the names and addresses of persons or firms concerned.

3. The information furnished under this Article shall be communicated by the Secretary-General to the High Contracting Parties.

Article 21.

The High Contracting Parties shall communicate to one another through the Secretary-General of the League of Nations the laws and regulations promulgated in order to give effect to the present Convention, and shall forward to the Secretary-General an annual report on the working of the Convention in their territories, in accordance with a form drawn up by the Advisory Committee on Traffic in Opium and other Dangerous Drugs.

Article 22.

The High Contracting Parties shall include in the annual statistics furnished by them to the Permanent Central Board the amounts of any of the drugs used by manufacturers and wholesalers for the compounding of preparations whether for domestic consumption or for export for the export of which export authorisations are not required.

The High Contracting Parties shall also include a summary of the returns made by the manufacturers in pursuance of Article 17.

Article 23.

The High Contracting Parties will communicate to each other through the Secretary-General of the League of Nations, as soon as possible, particulars of each case of illicit traffic discovered by them which may be of importance either because of the quantities involved or because of the light thrown on the sources from which drugs are obtained for the illicit traffic or the methods employed by illicit traffickers.

The particulars given shall indicate as far as possible:

(*a*) The kind and quantity of drugs involved;

(*b*) The origin of the drugs, their marks and lables;

(*c*) The points at which the drugs were diverted into the illicit traffic;

(*d*) The place from which the drugs were despatched, and the names of shipping or forwarding agents or consignors; the methods of consignment and the name and address of consignees, if known;

(*e*) The methods and routes used by smugglers and names of ships, if any, in which the drugs have been shipped;

(*f*) The action taken by the Government in regard to the persons involved, particularly those possessing authorisations or licences and the penalties imposed;

(*g*) Any other information which would assist in the suppression of illicit traffic.

Article 24.

The present Convention shall supplement The Hague Convention of 1912* and the Geneva Convention of 1925 in the relations between the High Contracting Parties bound by at least one of these latter Conventions.

Article 25.

If there should arise between the High Contracting Parties a dispute of any kind relating to the interpretation or application of the present Convention, and if such dispute cannot be satisfactorily settled by diplomacy, it shall be settled in accordance with any applicable agreements in force between the Parties providing for the settlement of international disputes.

In case there is no such agreement in force between the Parties, the dispute shall be referred to arbitration or judicial settlement. In the absence of agreement on the choice of another tribunal, the dispute shall, at the request of any one of the Parties, be referred to the Permanent Court of International Justice, if all the Parties to the dispute are Parties

* See "Treaty Series No. 17 (1921)", Cmd. 1520.

to the Protocol of the 16th December, 1920,* relating to the Statute of that Court, and, if any of the parties to the dispute is not a party to the Protocol of the 16th December, 1920, to an arbitral tribunal constituted in accordance with The Hague Convention of the 18th October, 1907,† for the Pacific Settlement of International Disputes.

Article 26.

Any High Contracting Party may, at the time of signature, ratification, or accession, declare that, in accepting the present Convention, he does not assume any obligation in respect of all or any of his colonies, protectorates and overseas territories or territories under suzerainty or mandate, and the present Convention shall not apply to any territories named in such declaration.

Any High Contracting Party may give notice to the Secretary-General of the League of Nations at any time subsequently that he desires that the Convention shall apply to all or any of his territories which have been made the subject of a declaration under the preceding paragraph, and the Convention shall apply to all the territories named in such notice in the same manner as in the case of a country ratifying or acceding to the Convention.

Any High Contracting Party may, at any time after the expiration of the five years' period mentioned in Article 32, declare that he desires that the present Convention shall cease to apply to all or any of his colonies, protectorates and overseas territories or territories under suzerainty or mandate, and the Convention shall cease to apply to the territories named in such declaration as if it were a denunciation under the provisions of Article 32.

The Secretary-General shall communicate to all the Members of the League and to the non-member States mentioned in Article 27, all declarations and notices received in virtue of this Article.

Article 27.

The present Convention, of which the French and English texts shall both be authoritative, shall bear this day's date and shall, until the 31st December, 1931, be open for signature on behalf of any Member of the League of Nations, or of any non-member State which was represented at the Conference which drew up this Convention, or to which the Council of the League of Nations shall have communicated a copy of the Convention for this purpose.

Article 28.

The present Convention shall be ratified. The instruments of ratification shall be transmitted to the Secretary-General of the League of Nations, who shall notify their receipt to all Members of the League and to the non-member States referred to in the preceding Article.

Article 29.

As from the 1st January, 1932, the present Convention may be acceded to on behalf of any Member of the League of Nations or any non-member State mentioned in Article 27.

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* See " Treaty Series No. 23 (1923) ", Cmd. 1981.

See Parliamentary Paper " Miscellaneous No. 6 (1908) ", Cd. 4175.

The instruments of accession shall be transmitted to the Secretary-General of the League of Nations, who shall notify their receipt to all the Members of the League and to the non-member States mentioned in that Article.

Article 30.

The present Convention shall come into force ninety days after the Secretary-General of the League of Nations has received the ratifications or accessions of twenty-five Members of the League of Nations or non-member States, including any four of the following:

France, Germany, United Kingdom of Great Britain and Northern Ireland, Japan, Netherlands, Switzerland, Turkey, and the United States of America.

Provided always that the provisions of the Convention other than Articles 2 to 5 shall only be applicable from the first of January in the first year in respect of which estimates are furnished in conformity with Articles 2 to 5.

Article 31.

Ratifications or accessions received after the date of the coming into force of this Convention, the Convention may be denounced by an period of ninety days from the date of their receipt by the Secretary-General of the League of Nations.

Article 32.

After the expiration of five years from the date of the coming into force of this Convention, the Convention may be denounced by an instrument in writing, deposited with the Secretary-General of the League of Nations. The denunciation, if received by the Secretary-General on or before the first day of July in any year, shall take effect on the first day of January in the succeeding year, and, if received after the first day of July, shall take effect as if it had been received on or before the first day of July in the succeeding year. Each denunciation shall operate only as regards the Member of the League or non-member State on whose behalf it has been deposited.

The Secretary-General shall notify all the Members of the League and the non-member States mentioned in Article 27 of any denunciations received.

If, as a result of simultaneous or successive denunciations, the number of Members of the League and non-member States bound by the present Convention is reduced to less than twenty-five, the Convention shall cease to be in force as from the date on which the last of such denunciations shall take effect in accordance with the provisions of this Article.

Article 33.

A request for the revision of the present Convention may at any time be made by any Member of the League of Nations or non-member

State bound by this Convention by means of a notice addressed to the Secretary-General of the League of Nations. Such notice shall be communicated by the Secretary-General to the other Members of the League of Nations or non-member States bound by this Convention, and, if endorsed by not less than one-third of them, the High Contracting Parties agree to meet for the purpose of revising the Convention.

Article 34.

The present Convention shall be registered by the Secretary-General of the League of Nations on the day of its entry into force.

In faith whereof the above-mentioned Plenipotentiaries have signed the present Convention.

Done at Geneva the thirteenth day of July, one thousand nine hundred and thirty-one, in a single copy, which shall remain deposited in the archives of the Secretariat of the League of Nations, and certified true copies of which shall be delivered to all the Members of the League and to the non-member States referred to in Article 27.

[*Here follow signatures on behalf of the United Kingdom and all parts of the British Empire not separate members of the League of Nations, Canada, India, Argentine Republic, Austria, Belgium, Bolivia, Chile, Costa Rica, Cuba, Czechoslovakia, Denmark, Domonican Republic, Egypt, Ethiopia, France,* Germany, Guatemala, Hejaz and Nejd, Italy, Japan, Liberia, Luxemburg, Mexico, Monaco, Netherlands, Panama, Paraguay, Portugal, San Marino, Siam,* Spain, Switzerland, United States,* Uruguay and Venezuela.*

The Convention is open to signature until the 31st December, 1931.]

Protocol of Signature.

I. When signing the Convention for limiting the manufacture and regulating the distribution of narcotic drugs dated this day, the undersigned Plenipotentiaries, duly authorised to that effect and in the name of their respective Governments, declare to have agreed as follows:—

If, on the 13th July, 1933, the said Convention is not in force in accordance with the provisions of Article 30, the Secretary-General of the League of Nations shall bring the situation to the attention of the Council of the League of Nations, which may either convene a new Conference of all the Members of the League, and non-member States on whose behalf the Convention has been signed or ratifications or accessions deposited, to consider the situation, or take such measures as it considers necessary. The Government of every signatory or acceding Member of the League of Nations or non-member State undertakes to be present at any Conference so convened.

II. The Japanese Government made the following reservation, which is accepted by the other High Contracting Parties:—

> Crude morphine resulting from the manufacture of prepared opium in the factory of the Government-General of Formosa and held in stock by that Government shall not be subjected to the limitation measures provided for in this Convention.

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* With reservations.

Such stocks of crude morphine will only be released from time to time in such quantities as may be required for the manufacture of refined morphine in factories licensed by the Japanese Government in accordance with the provisions of the present Convention.

In faith whereof the undersigned have affixed their signatures to this Protocol.

Done at Geneva, the thirteenth day of July, one thousand nine hundred and thirty-one, in a single copy, which will remain deposited in the archives of the Secretariat of the League of Nations; certified true copies will be transmitted to all Members of the League of Nations and to all non-member States represented at the Conference.

[*Here follow the signatures.*]

Convention of 1936, for the Suppression of the Illicit Traffic in Dangerous Drugs.

(List of High Contracting Parties.)

Having resolved, on the one hand, to strengthen the measures intended to penalise offences contrary to the provisions of the International Opium Convention signed at The Hague on 23rd January 1912, the Geneva Convention of 19th February 1925, and the convention for limiting the Manufacture and regulating the Distribution of Narcotic Drugs signed at Geneva on 13th July 1931, and, on the other hand, to combat by the methods most effective in the present circumstances the illicit traffic in the drugs and substances covered by the above Conventions,

Have appointed as their Plenipotentiaries:

(List of Plenipotentiaries.)

who, having produced their full powers, found in good and due form, have agreed on the following provisions:

Article 1.

1. In the present Convention, "narcotic drugs" shall be deemed to mean the drugs and substances to which the provisions of the Hague Convention of 23rd January 1912, and the Geneva Conventions of 19th February, 1925, and 13th July 1931, are now or hereafter may be applicable.

2. For the purposes of the present Convention, the word "extraction" connotes an operation whereby a narcotic drug is separated from the substance or compound of which it forms part, without involving any actual manufacture or conversion properly so called. This definition of the word "extraction" is not intended to include the processes whereby raw opium is obtained from the opium poppy these being covered by the term "production."

Article 2.

Each of the High Contracting Parties agrees to make the necessary legislative provisions for severely punishing, particularly by imprisonment or other penalties of deprivation of liberty, the following acts, namely:—

(*a*) The manufacture, conversion, extraction, preparation, possession, offering, offering for sale, distribution, purchase, sale, delivery on any terms whatsoever, brokage, despatch, despatch in transit, transport, importation and exportation of narcotic drugs, contrary to the provisions of the said Conventions.

(*b*) International participation in the offences specified in this Article.

(*c*) Conspiracy to commit any of the above-mentioned offences.

(*d*) Attempts and, subject to the conditions prescribed by national law, preparatory acts.

Article 3.

The High Contracting Parties who possess extra-territorial jurisdiction in the territory of another High Contracting Party undertake to enact the necessary legislative provisions for punishing such of their nationals as are guilty within that territory of any offence specified in Article 2 at least as severely as if the offence had been committed in their own territory.

Article 4.

Each of the Acts specified in Article 2 shall, if committed in different countries, be considered as a distinct offence.

Article 5.

The High Contracting Parties, whose national law regulates cultivation, gathering and production with a view to obtaining narcotic drugs, shall likewise make severely punishable contraventions thereof.

Article 6.

In countries where the principle of the international recognition of previous convictions is recognised, foreign convictions for the offences referred to in Article 2 shall, subject to the conditions prescribed by the domestic law, be recognised for the purpose of establishing habitual criminality.

Article 7.

1. In countries where the principle of the extradition of nationals is not recognised, nationals who have returned to the territory of their own country, after the commission abroad of any of the offences referred to in Article 2, shall be prosecuted and punished in the same manner as if the offence had been committed in the said territory, even in a case where the offender has acquired his nationality after the commission of the offence.

2. This provision does not apply, if, in a similar case, the extradition of a foreigner cannot be granted.

Article 8.

Foreigners who are in the territory of a High Contracting Party and who have committed abroad any of the offences set out in Article 2 shall be prosecuted and punished as though the offence had been committed in that territory if the following conditions are realised, namely, that—

(*a*) extradition has been requested and could not be granted for a reason independent of the offence itself;

(*b*) the law of the country of refuge considers prosecution for offences committed abroad by foreigners admissible as a general rule.

Article 9.

1. The offences set out in Article 2 shall be deemed to be included as extradition crimes in any extradition treaty which has been or may hereafter be concluded between any of the High Contracting Parties.

2. The High Contracting Parties who do not make extradition conditional on the existence of a treaty or on reciprocity shall as between themselves recognise the offences referred to above as extradition crimes.

3. Extradition shall be granted in conformity with the law of the country to which application is made.

4. The High Contracting Party to whom application for extradition is made, shall, in all cases, have the right to refuse to effect the arrest or to grant the extradition of a fugitive offender if his competent authorities consider that the offence of which the fugitive offender is accused or convicted is not sufficiently serious.

Article 10.

Any narcotic drugs as well as any substances and instruments intended for the commission of any of the offences referred to in Article 2 shall be liable to seizure and confiscation.

Article 11.

1. Each of the High Contracting Parties shall set up, within the framework of its domestic law, a central office for the supervision and co-ordination of all operations necessary to prevent the offences specified in Article 2, and for ensuring that steps are taken to prosecute persons guilty of such offences.

2. This central office—

(*a*) shall be in close contact with other official institutions or bodies dealing with narcotic drugs;

(*b*) shall centralise all information of a nature to facilitate the investigation and prevention of the offences specified in Article 2;

(*c*) shall be in close contact with and may correspond direct with the central offices of other countries.

3. Where the Government of a High Contracting Party is federal in character, or where the executive authority of its Government is distributed between central and local Governments, the supervision and co-ordination specified in paragraph 1 and the execution of the functions specified in (*a*) and (*b*) of paragraph 2 shall be carried out in conformity with the constitutional or administrative system thereof.

4. Where the present convention has been applied to any territory by virtue of Article 18, the requirements of the present Article may be carried out by means of a central office set up in or for that territory acting in conjunction, if necessary, with the central office in the metropolitan territory concerned.

5. The powers and the functions of the central office may be delegated to the special administration referred to in Article 15 of the Convention for limiting the Manufacture and regulating the Distribution of Narcotic Drugs of 1931.

Article 12.

1. The central office shall co-operate with the central offices of foreign countries to the greatest extent possible, in order to facilitate the prevention and punishment of the offences specified in Article 2.

2. The office shall, so far as it thinks expedient, communicate to the central office of any country which may be concerned—

(*a*) particulars which would make it possible to carry out any investigations or operations relating to any transactions in progress or proposed;

(*b*) any particulars which it has been able to secure regarding the identity and the description of traffickers with a view to supervising their movements;

(*c*) discoveries of secret factories of narcotic drugs.

Article 13.

1. The transmission of letters of request relating to the offences referred to in Article 2 shall be effected—

(*a*) preferably by direct communication between the competent authorities of each country or through the central offices, or

(*b*) by direct correspondence between the Ministers of Justice of the two countries or by direct communication from another competent authority of the country making the request to the Minister of Justice of the country to which the request is made, or

(*c*) through the diplomatic or consular representative of the country making the request in the country to which the request is made. For this purpose, the letters of request shall be sent by such representative to the authority designated by the country to which the request is made.

2. Each High Contracting Party may, by communication to the other High Contracting Parties, express its desire that letters of request to be executed within its territory should be sent to it through the diplomatic channel.

3. In case (*c*) of paragraph 1, a copy of the letter of request shall at the same time be sent by the diplomatic or consular representative of the country making the request to the Minister for Foreign Affairs of the country to which application is made.

4. Unless otherwise agreed, the letter of request shall be drawn up in the language of the authority to which request is made or in a language agreed upon by the two countries concerned.

5. Each High Contracting Party shall notify to each of the other High Contracting Parties the method, or methods, of transmission mentioned above which it will recognise for the letters of request of the latter High Contracting Party.

6. Until such notification is made by a High Contracting Party, its existing procedure in regard to letters of request shall remain in force.

7. The execution of letters of request shall not be subject to payment of taxes or expenses other than the expenses of experts.

8. Nothing in the present Article shall be construed as an undertaking on the part of the High Contracting Parties to adopt in criminal matters any form or methods of proof contrary to their laws or to execute letters of request otherwise than within the limits of their laws.

Article 14.

The participation of a High Contracting Party in the present Convention shall not be interpreted as affecting that Party's attitude on the general question of criminal jurisdiction as a question of international law.

Article 15.

The present Convention does not affect the principle that the offences referred to in Articles 2 and 5 shall in each country be defined prosecuted and punished in conformity with the general rules of its domestic law.

Article 16.

The High Contracting Parties shall communicate to one another through the Secretary-General of the League of Nations the laws and regulations promulgated in order to give effect to the present Convention, and also an annual report on the working of the Convention in their territories.

Article 17.

If there should arise between the High Contracting Parties a dispute of any kind relating to the interpretation or application of the present Convention, and if such dispute cannot be satisfactorily settled by diplomacy, it shall be settled in accordance with any applicable agreements in force between the Parties providing for the settlement of international disputes.

In case there is no such agreement in force between the Parties, the dispute shall be referred to arbitration or judicial settlement. In the absence of agreement on the choice of another tribunal, the dispute shall, at the request of any one of the Parties, be referred to the Permanent Court of International Justice, if all the Parties to the dispute are Parties to the Protocol of 16th December 1920, relating to the Statute of that Court, and, if any of the Parties to the dispute is not a Party to the Protocol of 16th December 1920, to an arbitral tribunal constituted in accordance with the Hague Convention of 18th October 1907, for the Pacific Settlement of International Disputes.

Article 18.

1. Any High Contracting Party may, at the time of signature, ratification or accession, declare that, in accepting the present Convention, he does not assume any obligation in respect of all or any of his colonies, protectorates and overseas territories under suzerainty or mandate, and the present Convention shall not apply to any territories named in such declaration.

2. Any High Contracting Party may give notice to the Secretary-General of the League of Nations at any time subsequently that he declares that the Convention shall apply to all or any of his territories which

have been made the subject of a declaration under the preceding paragraph, and the Convention shall apply to all the territories named in such notice ninety days after its receipt by the Secretary-General of the League of Nations.

3. Any High Contracting Party may, at any time after the expiration of the period of five years mentioned in Article 21, declare that he desires that the present Convention shall cease to apply to all or any of his colonies, protectorates and overseas territories or territories under suzerainty or mandate, and the Convention shall cease to apply to the territories named in such declaration one year after its receipt by the Secretary-General of the League of Nations.

4. The Secretary-General shall communicate to all the Members of the League and to the non-member States mentioned in Article 19 all declarations and notices received in virtue of this Article.

Article 19.

The present Convention, of which the French and English texts shall both be equally authoritative, shall bear this day's date, and shall, until 31st December 1936, be open for signature on behalf of any Member of the League of Nations, or of any non-member State which received an invitation to the Conference which drew up the present Convention, or to which the Council of the League of Nations shall have communicated a copy of the Convention for this purpose.

Article 20.

The present Convention shall be ratified. The instruments of ratification shall be transmitted to the Secretary-General of the League of Nations, who shall notify their receipt to all Members of the League and to the non-member States referred to in the preceding Article.

Article 21.

1. As from 1st January 1937, the present Convention shall be open to accession on behalf of any Member of the League of Nations or any non-member State mentioned in Article 19.

2. The instruments of accession shall be transmitted to the Secretary-General of the League of Nations, who shall notify their receipt to all Members of the League and to the non-member States mentioned in that Article.

Article 22.

The present Convention shall come into force ninety days after the Secretary-General of the League of Nations has received the ratifications or accessions of ten Members of the League of Nations or non-member States. It shall be registered on that date by the Secretary-General of the League of Nations.

Article 23.

Ratifications or accessions received after the deposit of the tenth ratification or accession shall take effect as from the expiration of a period of ninety days from the date of their receipt by the Secretary-General of the League of Nations.

Article 24.

1. After the expiration of five years from the date of the coming into force of the present Convention, it may be denounced by an instrument in writing, deposited with the Secretary-General of the League of Nations. The denunciation shall take effect one year after the date of its receipt by the Secretary-General of the League of Nations and shall operate only as regards the Member of the League or non-member State on whose behalf it has been deposited.

2. The Secretary-General shall notify all the Members of the League and the non-member States mentioned in Article 19 of any denunciations received.

3. If, as a result of simultaneous or successive denunciations, the number of Members of the League and non-member States bound by the present Convention is reduced to less than ten, the Convention shall cease to be in force as from the date on which the last of such denunciations shall take effect in accordance with the provisions of this Article.

Article 25.

A request for the revision of the present Convention may at any time be made by any Member of the League of Nations or non-member State bound by this Convention by means of a notice addressed to the Secretary-General of the League of Nations. Such notice shall be communicated by the Secretary-General to the other Members of the League of Nations or non-member States bound by this Convention, and, if endorsed by not less than one-third of them, the High Contracting Parties agree to meet for the purpose of revising the Convention.

Protocol of Signature.

When signing the Convention of 1936, for the Suppression of the Illicit Traffic in Dangerous Drugs dated this day, the undersigned Plenipotentiaries, in the name of their Governments, declare to have agreed—

(1) to China making acceptance of the Convention subject to the following reservation as to Article 9:—

"So long as the consular jurisdiction still enjoyed by the nationals of certain Powers in China is not abolished, the Chinese Government is unable to assume the obligations resulting from Article 9, involving a general undertaking by the Contracting Parties to grant the extradition of foreigners guilty of the offences referred to in that Article;"

(2) that the Netherlands make their acceptance of the Convention subject to the reservation that, according to the basic principles of penal law in the Netherlands, they are able to comply with sub-paragraph (*c*) of Article 2, only in circumstances where there is a commencement of execution;

(3) that India makes its acceptance of the Convention subject to the reservation that the said Convention does not apply to the Indian States, or to the Shan States (which are part of British India).

IN FAITH WHEREOF the undersigned have affixed their signatures to the present Protocol.

DONE at Geneva, the twenty-sixth day of June, one thousand nine hundred and thirty-six, in a single copy, which shall remain deposited in the archives of the Secretariat of the League of Nations, and certified true copies of which shall be delivered to all the Members of the League of Nations, and to the non-member States referred to in Article 19.

Final Act.

The Governments of Afghanistan, the United States of America, Austria, the United States of Brazil, the United Kingdom of Great Britain and Northern Ireland, Bulgaria, Canada, Chile, China, Cuba, Denmark, Egypt, Ecuador, Spain, France, Greece, Honduras, Hungary, India, Iraq, the Irish Free State, Japan, Liechtenstein, the United States of Mexico, Nicaragua, Norway, Panama, the Netherlands, Peru, Poland, Portugal, Roumania, Siam, Switzerland, Czechoslovakia, Turkey, the Union of Soviet Socialist Republics, Uruguay, the United States of Venezuela and Yugoslavia,

Having accepted the invitation extended to them in execution of a resolution adopted by the Council of the League of Nations on 20th January 1936, for the purpose of concluding a Convention for the Suppression of the Illicit Traffic in Dangerous Drugs,

Have appointed the following delegates:

(List of Delegates.)

who accordingly assembled at Geneva.

The Council of the League of Nations appointed as President of the Conference: M. Joseph Limburg, Member of the Council of States of the Netherlands.

The Conference has appointed as Vice-President: M. de Reffye, Minister Plenipotentiary, "Sous-Directeur du contentieux et des chancelleries" at the Ministry of Foreign Affairs of the French Republic.

The functions of Secretary-General to the Conference were assumed by: M. Eric Einar Ekstrand, Director of the Opium Traffic and Social Questions Sections, representing the Secretary-General of the League of Nations.

In the course of a series of meetings between 8th June and 26th June 1936, the instruments hereinafter enumerated were drawn up:—

I.—CONVENTION OF 1936, FOR THE SUPPRESSION OF THE ILLICIT TRAFFIC IN DANGEROUS DRUGS.

II.—PROTOCOL OF SIGNATURE OF THE CONVENTION.

The Conference also adopted the following:—

I.—*Interpretations.*

1. It is understood that the provisions of the Convention, and, in particular, the provisions of Articles 2 and 5, do not apply to offences committed unintentionally.

2. Article 15 is to be interpreted in the sense that the Convention does not in particular affect the liberty of the High Contracting Parties to

regulate the principles under which mitigating circumstances may be taken into account.

II.—*Recommendations.*

1. The Conference,

Recalling that the International Opium Conference of 1912, determined to bring about the gradual suppression of the abuse of opium, inserted in the International Opium Convention of 1912, the following Article 6: "The contracting Powers shall take measures for the gradual and effective suppression of the manufacture of, internal trade, in and use of prepared opium, with due regard to the varying circumstances of each country concerned, unless regulations on the subject are already in existence";

Recalling that the Parties to the Geneva Opium Agreement of 1925, in the Preamble, declared that they were fully determined to bring about the gradual and effective suppression of the manufacture of, internal trade in and use of prepared opium, as provided for in Chapter II of the International Opium Convention of 1912, in their Far Eastern possessions and territories, including leased or protected territories, in which the use of prepared opium is temporarily authorised; and that they were desirous, on the grounds of humanity and for the purpose of promoting the social and moral welfare of their peoples, of taking all possible steps for achieving the suppression of the use of opium for smoking with the least possible delay;

Desiring to take the opportunity afforded by the present Conference of urging the countries concerned to continue their efforts in this matter;

Recommends that Governments which still permit use of opium for other than medical or scientific purposes should without undue delay take effective action with a view to the abolition of such use of opium.

2. The Conference recommends that countries which recognise the principle of extradition of their nationals should grant the extradition of such of their nationals, as, being in their territory, are guilty of the commission abroad of the offences dealt with in Article 2, even if the extradition treaty applicable contains a reservation on the subject of the extradition of nationals.

3. The Conference recommends the High Contracting Parties to create, where necessary, a specialised police service for the purposes of the present Convention.

4. The Conference recommends that the Advisory Committee on Traffic in Opium and Other Dangerous should consider the question whether it is desirable that meetings of the representatives of the central offices of the High Contracting Parties should take place in order to ensure, improve and develop international co-operation as provided for in the present Convention, and, should occasion arise, to give an opinion to the Council of the League of Nations on the subject.

IN FAITH WHEREOF the Delegates have signed the present Act.

DONE at Geneva, the twenty-sixth day of June, one thousand nine hundred and thirty-six, in a single copy, which shall be deposited in the archives of the Secretariat of the League of Nations, and of which authenticated copies shall be delivered to all States represented at the Conference.

GIPD—L1121 CBR—30-9-38—350.

DELHI

Electric Supply Enquiry Committee

1936

REPORT

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NOTE.

The discussions and proposals in our report are of considerable interest for the ordinary citizen of Delhi and it has been our object to make the report immediately intelligible to the non-technical reader. For this purpose we have kept our use of technical terms to the minimum, and in furtherance of this aim give below a brief glossary of terms whose use has been inevitable:—

Term.	*Definition.*
Alternating Current (*Symbol* A. C.)	An electric current which alternately reverses its direction in a circuit in a periodic manner.
Continuous or Direct Current. (*Symbol* C. C. or D. C.).	An electric current flowing in one direction only and sensibly free from pulsation.
Maximum Demand (*Symbol* M. D.)	The maximum current, power or volt-amperes supplied to a consumer during a prescribed period.
Maximum Demand Tariff.	A two-part tariff in which the fixed charge is based on the assertained or calculated maximum demand of the consumer.
Load factor . .	The ratio of the average load to the maximum load during a prescribed period of time. The ratio is usually expressed as a percentage and the period of time is usually one year, one week or one day.
Watt (*Symbol* W) .	A practical unit of power and is the energy expended per second by an unvarying electric current of one ampere under an electric pressure of one volt.
Kilowatt (*Symbol* KW)	A unit of power equal to one thousand watts.
Kilowatt Hour (*Symbol* KWH).	A unit of energy and is the energy expended in one hour at a rate of one thousand watts.
Unit of Electricity (*Symbol* Unit).	A unit of electrical energy and is equal to one Kilowatt Hour or 3415 British Thermal Units.
Two-part Tariff .	A method of charging for electrical energy in which a fixed charge is made based on a characteristic of the service (*e.g.*, the maximum demand, rateable value or floor space on the consumer's premises), with an additional charge for each unit consumed.
Voltage . . .	Electromotive force or potential difference expressed in volts.
H. T. and E. H. T. .	The symbols H. T. and E. H. T. mean "high tension" and "extra high tension" respectively, and are used to denote voltage or pressure when the difference of potential under ordinary working conditions exceeds 650 volts.
Power factor of alternating current system.	*In a single phase system.* The ratio of the watts to the volt-amperes.
	In a three-phase balanced system.—The ratio of the total watts to the total volt-amperes.

INTRODUCTORY.

New Delhi, the 9th March 1937.

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
DEPARTMENT OF EDUCATION, HEALTH AND LANDS.

Delhi Electric Supply Enquiry Committee Report.

SIR,

WE have the honour to present the report of the Delhi Electric Supply Enquiry Committee.

2. The formation of our Committee was intimated in the Government of India Press Communiqué, dated the 17th June 1936 to the following effect:—

It has been represented to the Government of India that the present arrangements for the supply of electricity in Delhi are proving inadequate to satisfy the growing demand. The Government of India have, therefore, decided to appoint a Committee with the following terms of reference:—

To examine the present position of Delhi Province in respect of the supply of electricity and, with due regard to the probable future demand for official, municipal and private use (including demand for industrial purposes), to make recommendations as to the organisation and control of supply and the part of Government therein. The Committee will consist of—

1. Sir James Pitkeathly, Kt., C.M.G., C.I.E., C.V.O., C.B.E., D.S.O., A.M.I.E.E., M.I.Mech.E., M.I.E. (India), Chief Controller of Stores,—Chairman.
2. Lala Shri Ram, Secretary, Delhi Cloth Mills, and
3. Mr. W. M. Vacy-Ash, O.B.E., A.M.I.E., A.M.I.Mech.E., Electrical Inspector, Delhi.

It is expected that the Committee will shortly meet in Simla to discuss preliminary questions such as procedure and the information required by it. When the data needed by it have been collected the Committee will take up the main part of its work in Delhi.

Mr. M. W. Yeatts, I.C.S., Deputy Secretary to the Government of India, Department of Education, Health and Lands, was later appointed Secretary to the Committee.

3. During the summer our Chairman was in the United Kingdom and took advantage of his presence there to get into touch with the Directors of the Delhi Electric Supply & Traction Company, Limited (which hereafter, for convenience and euphony we shall refer to as the Company) to whom he had communicated the terms of reference, and had certain informal exploratory discussions. He reached Simla on the 10th

September 1936, and a further Press Notice was issued on the 18th September, 1936, to the following effect:—

> The Government of India have appointed a Committee to examine the present position of Delhi Province in respect of the supply of electricity and, with due regard to the probable future demand for official, municipal and private use (including demand for industrial purposes), to make recommendations as to the organisation and control of supply and the part of Government therein.
>
> Persons interested in the matter who desire that their views should be considered by the Committee are requested to send their representations to—
>
> The Secretary,
>
> Delhi Electric Supply Enquiry Committee,
>
> c/o. Department of Education, Health and Lands,
>
> Simla/New Delhi.
>
> All representations, which should be accompanied by three spare copies, must reach the Secretary not later than the 31st October, 1936.
>
> The Committee will assemble in Delhi on the 2nd November, 1936, and may, at their discretion, request those persons who submit representations, to appear before them during their sittings to give oral evidence in support of their written representations. The names of the witnesses who will be prepared to attend for this purpose, should be stated in representations.

4. There was a satisfactory response to the invitation conveyed in this notice. A list of those who furnished representations is given for convenience as Appendix II to this volume of the report while the actual representations themselves have been gathered together in a separate volume. The two main licensees supplying electrical energy in the province submitted very full memoranda which were amplified on various points of details in separate correspondence. The consumers' point of view was adequately represented by the Delhi Municipal Committee and various minor users. The New Delhi Committee occupies a peculiar position inasmuch as it is one of the two chief producers and also a principal municipal authority, *i.e.*, it speaks, as it were, with two voices, one of the producers and one of the consumers, each, as the poet said, a mighty voice. From the nature of the conditions obtaining in the Delhi Province and the comparatively limited degree of industrial development, a great deal was not to be expected in the way of industrial representation but the Committee are satisfied that the industrial position, from the point of view of the possibilities of extending the use of electricity, found adequate expression.

5. It was considered desirable to hold the Committee's actual enquiry in Delhi itself, and also that its enquiry should coincide with the time when the General Manager of the Company was expected back from the United Kingdom, *i.e.*, mid-November. The Committee assembled there for the first time on the morning of the 2nd November 1936 and after preparatory discussions and arrangement of programme that day visited the power stations in Delhi including the site acquired by the

Company for their new station. On the 4th November 1936 the Committee went over the sewage disposal system, including its projected developments, with the Superintending Engineer, Health Services, and also the pumping plant and equipment at the waterworks and thereafter visited a selection of large power users in the Delhi mill area.

6. Oral evidence was taken from the bodies and individuals set out in Appendix III who, it will be observed, represent the chief interests affected by electrical development, rates, or possibilities. The only notable absentees either from the list of those submitting representations or offering evidence are the New Delhi Cantonment and the Shahdara Notified Area authorities.

7. It became evident after the arrival from England of the General Manager of the Company that he would not be in a position to commit his Company to certain proposals which had by then taken shape in the Committee's mind and the Company after consideration expressed a desire to send out two of its directors to appear before us. Owing to the extreme difficulty of obtaining passages it was not possible for these directors to reach Delhi before the 17th December 1936; hence a certain prolongation of our enquiry. It would, however, in our opinion have been quite impossible to present an adequate or satisfactory report without giving the Company a full opportunity for leading authoritative evidence. Nor would such a procedure have gained anything in time. On the contrary, and whatever the point of view, the Company's position is an outstanding element in the electricity supply situation of Delhi and one to which due weight and importance must be given. Our object has been to invite the fullest discussion by all concerned in order to present a report which should be based as far as possible on general agreement.

8. Our terms of reference instruct us to examine the present position of Delhi "with due regard to the probable future demand . . . . and to make recommendations". These terms make no specific reference to the charges levied in connection with the supply of energy but one of our first conclusions was that our enquiry would be quite ineffective for the purposes Government had in view unless we examined fully this matter of charges. For example any estimate of "probable future demand" is inseparable from the charges at which that demand might be met. Indeed we were informed categorically by one of our earliest witnesses that unless the scale of charges at present levied for energy for power purposes in Delhi Province were drastically reduced, there could be no question of substantial industrial consumption, whereas the degree to which industrial demand can be brought into the general scheme has a vital bearing on the future supply system possible for the province. Thus from the very outset we were brought up against the matter of charges and faced with the position that unless this were dealt with, any reasonable discussion of the possibilities of the extension of the use of electrical energy in Delhi was inhibited.

9. Delhi is a small province and its electricity supply problem similarly relatively small. On the other hand, it presents every form of complication that may appear in enquiries of larger scale. Work in miniature is not less difficult than work in mass, and in some ways more so. Our Delhi enquiry, therefore, has presented almost every facet that an enquiry into electricity supply could offer.

We desire here to express our obligations to those who by their representations or evidence or by providing facilities for inspection have enabled

us to investigate fully the electricity position in Delhi and to reach the considered proposals set out in the succeeding part of this report. Both local bodies took a deep interest in our enquiry and sent strong delegations to lead evidence before us. The Delhi Municipal Committee were good enough to appear twice. We should like to mention also Messrs. Lovering and Taylor, two directors of the Company, who undertook at short notice the long journey from England to this country and who, throughout their stay, were at pains to be of assistance to the Committee. The local representatives of the licensees responded readily and fully to frequent requests for information on matters of detail and we should like to express our gratitude to Messrs. Dean, Donkin and Soi, for the assistance thus freely given. The Superintendent of Industries, Delhi Province, most willingly undertook the task of preparing statistics relating to power users in the province and the information furnished by him was of great value in framing our estimates of probable demand. We are also indebted to Mr. H. P. Thomas, C.I.E., Chief Engineer, Punjab, Public Works Department, Electricity Branch, for putting his experience at our disposal when we were considering the possibility of securing hydro-electric power for Delhi. We have to express a similar indebtedness to Sir William Stampe in relation to possibilities of a United Provinces link. The Cawnpore and Lahore Electric Supply Corporations and Tata Hydro-Electric Agencies, Ltd., of Bombay furnished us promptly and willingly with full information regarding costs, rates, licences and other matters, and to them also our thanks are due. We have also to thank the Governments of Madras and the United Provinces for sending on request copies of licences obtaining in their areas. In general we have been struck by the degree of interest, not confined to Delhi province, taken in our enquiry and the desire and readiness to assist us.

We desire to acknowledge the ability and efficiency of our Secretary, Mr. M. W. Yeatts, has displayed in the performance of his duties. At every stage of our enquiry we have received from him full and ready co-operation. His wide knowledge of administrative and commercial matters on which we have freely drawn has been of the utmost value to us.

Our thanks are also due to the reporting and clerical staff of the Education, Health and Lands Department for their consistent good work throughout the enquiry.

The acknowledgments specified above cover those to whom our thanks are chiefly due but we should like here to extend this acknowledgment to all who, by their interest or assistance, have aided our enquiry.

History, development and present position of electricity supply in Delhi Province.

10. The map at the end has been designed to give an immediate view of the general position regarding electricity supply in the Delhi province. The various local bodies are shown, the electricity supply areas with indication of systems of supply (Continuous or Alternating Current), the power stations and sub-stations, and the large users, actual or potential.

11. The history of electricity supply in Delhi so far as the Committee is concerned may be said to begin with the issue by the Government of the Punjab of a licence under the Indian Electricity Act (III of 1903) entitled

the Delhi Municipality Electric Licence of 1905. The licence was amended in March 1925 and April 1932 and is still the authority under which the Company operates.

In 1911 the Coronation Durbar of the late King Emperor George V created a quite exceptional demand for energy for lighting and other purposes. The Company, at that time, were unable to meet more than a very small part of the demand and Government were obliged to construct a power station of their own at a site in the Durbar area to the north of the old city and within the present Notified Area, Civil Lines.

12. When as a result of the formation of New Delhi in its present location south of the old city it was decided to build a new power house and give up that in the Civil Lines, the Company took over the obligation to supply the Civil Lines and the Government quarters there at certain rates which figure in the bulk supply agreement entered into with it. These rates have been the subject of frequent protests in the legislature and elsewhere and formed the subject of adverse representations made to us by residents in that area.

13. In 1925 the Government of India built and equipped the present New Delhi power station on the right bank of the Jumna near the Delhi Gate. In 1932 the New Delhi electrical undertaking was transferred to the New Delhi Municipal Committee, to whom a licence for the supply of electric energy in the area known as the New Delhi Municipal Area, including any future extensions up to the southern boundary of the province, was granted by the Chief Commissioner.

14. The map shows a third licensee's supply area on the east bank of the river. This covers the small detached notified area of Shahdara and is at once distinguishable from the two larger areas by the fact that it takes its supply from another province and, in fact, illustrates the inevitable close connection that exists between a small unit such as Delhi and the larger units on either side, a relationship particularly obvious in connection with a commodity in which distance matters so little as electricity and in which administrative boundaries are more likely to be an obstacle than anything else. The supply to Shahdara is under a licence granted to Messrs. Martin & Co. of Calcutta and lays down that the supply shall, in the first instance, be obtained in bulk from the Public Works Department, Irrigation Branch, United Provinces, with the further interesting condition that this supply is "in the first instance for a period of 5 years". After the expiry of this 5 years therefore in December 1937 there is no obstacle to the licensees of Shahdara taking their supply from any other source, *e.g.*, from a source located in Delhi itself. The bearing of this on the Committee's proposals will be examined later. But we wish here to support the recommendation of the Punjab Chamber of Commerce that the area supplied from the United Provinces Hydro-Electric Project should not be extended.

The New Cantonment area, it will be observed, is uncoloured in the map, that is, it does not come within any of the licensees' regions of supply and no licence has been issued in its regard. Nevertheless it takes its power from the New Delhi Municipal Committee; this is under an agreement, dated the 1st June 1934 whereby energy is supplied in bulk at 6,000 volts at a point on the Lower Ridge road, the military authorities thereafter being responsible for the conversion and distribution of the supply to the consumers.

Energy is similarly supplied for the military pumping station and the Delhi Fort.

15. The energy produced in the Company's Power Station is generated by oil engines and the plant comprises units of a total capacity of 3,937 KW. In all 10 generating units (some of obsolete type) of outputs varying from 150 to 1,030 KW are in use. Three of these generate 3-phase alternating current at 6,600 volts 50 cycles; the remaining units are used for producing continuous current at 500/550 volts.

16. In the New Delhi Municipal Power Station the energy is generated by steam. The plant at present installed has a total output of 6,100 KW and consists of three water tube boilers the total normal steaming capacity of which is 56,000 lbs. per hour at a pressure of 200 lbs. per sq. inch, and

One	3000 KW	Turbo alternator set.
One	1500 KW	Turbo alternate set.
Two	600 KW	Reciprocating Engine alternator sets.
One	400 KW	Do. do.

The reciprocating engine sets are not normally used but are retained as standby plant. The New Delhi Municipal Committee recently decided to increase the capacity of the generating station and contracts have been placed for a boiler and turbo alternator which, when brought into service towards the end of 1937, will increase the total output to 10,200 KW. We have been given full details of this additional plant and are satisfied that it will fit in with our proposals for future development.

In addition to generating energy in their own power station, the Company purchases part of its requirements in bulk from the New Delhi Municipal Committee, and during the year ending December 1935, 1,231,094 units were obtained from this source.

17. In the area covered by the Company's licence, the supply is partly on the 3-wire continuous current system at 500/250 volts and partly by 3-phase alternating current at 400/230 volts. The original supply was entirely on the continuous current system but when the supply to certain parts of the Notified Area Civil Lines was taken over by the Company, the alternating current system was adopted for these areas.

18. In the undertaking of the New Delhi Municipal Committee the energy is generated at 6,600 volts 3-phase alternating current at 50 cycles and is distributed at this pressure to various points in the area of supply where it is converted or transformed to pressures suitable for the consumers' requirements. Both alternating and continuous current systems of supply are used. The reason for this, we have been informed, was that when the electricity distribution system for the new capital was designed no entirely satisfactory alternating current fan had been placed on the market. It was also considered essential to make provision for the use of large storage batteries to ensure continuity of supply in the event of failure of the generating plant. These conditions necessitated the use of the continuous current system. The contemplated use of storage batteries, however, did not materialise, and meanwhile great improvements had taken place in the design and efficiency of alternating current fans and other consumers' apparatus. These changes have been reflected in the fact that most of the recent extensions of distribution in the New Delhi supply area have been on the alternating system.

19. The Company, which is a sterling company incorporated in England, was registered in May 1906 as the Delhi Electric Tramways and Lighting Company Limited and the present name was adopted on the 4th April 1928. The first issue of capital consisted of:—

6 per cent. Preferred and Participating Shares of £1 each	£100,000
and	
Ordinary shares of	£30,000

In 1928 further preferred share were issued at pay to the preferred shareholders to the amount of £20,000. The total capital of the Company at this period amounting to £150,000 was converted into ordinary shares of one class, and in 1929 there was an issue of bonus shares to the shareholders amounting to £50,000, making a total issued capital of £200,000.

20. The Company explained that the issue of the bonus shares amounting to £50,000 was a measure of compensation to those shareholders who had to sacrifice dividends in order to provide the share capital of the Company.

The Company have paid dividends on the share capital, ordinary and preferred, since 1919, and the dividends during recent years have been at the rate of 12 per cent. tax-free on the total share capital in the concern.

21. A statement showing the dividends paid by the Company since 1908 is given in Appendix IV. Further information in regard to the financial position of the Company will be found in the accounts maintained by the Company under the provisions of the Indian Electricity Act, 1910, of which a copy relating to the year 1935 is furnished as Appendix V.

22. The administrative control of the complete electrical undertaking in New Delhi was transferred to the New Delhi Municipal Committee in 1932 at a substantially written down value. The capital in the assets of the undertaking at the end of 1932 exclusive of the road lighting was valued at Rs. 48,88,600, and the Municipal Committee have built up additional assets since the time of the transfer. The total value of the undertaking at the end of 1935-36 has been given at Rs. 50,91,194. The electrical undertaking formed only part of the assets transferred by the Government, the total value of which was estimated at Rs. 60 lakhs.

This sum has been treated as a loan and is repayable in thirty half-yearly equated instalments of Rs. 1,72,608 inclusive of interest.

23. From the *pro forma* accounts given in the Annual Administration Reports of the Municipal Committee the following figures relating to the working of the electrical undertaking during the past three years have been obtained:

	1933-34.	1934-35.	1935-36.
	Rs.	Rs.	Rs.
Expenditure on Capital Account	49,47,829	49,95,619	50,91,194
Total Revenue	9,21,595	10,41,395	10,99,573
Direct Expenditure	3,18,417	3,22,581	3,73,707
Interest provision at 5 per cent.	2,47,391	2,49,781	2,54,561
Depreciation provision	1,06,965	1,07,070	1,82,067
Profit available after providing for all charges.	2,48,822	3,61,963	2,89,238

It will be observed from these figures that the New Delhi Municipal Committee have during the three years ending 1935-36 obtained from

the electrical undertaking an average of Rs. 3,00,000 per annum after meeting all charges including charges for the service of capital. This sum has been treated as part of the revenue of the committee and utilised for general municipal purposes.

24. In the following table figures are given to illustrate the development of the undertakings during the past ten years and the growth of demand for electrical energy in the areas of supply of the respective licensees.

Delhi Electric Supply and Traction Co.

Year.	Units generated and purchased.	Total units sold.	Load connected. in KW.	Total No. of consumers.	Plant installed in KW.	Maximum supply demanded in KW.
1926 . .	4,914,074	4,130,188	8,194	6,754	2,127	1,932
1927 . .	5,470,980	4,482,313	9,320	7,649	2,127	2,077
1928 . .	6,686,724	5,595,142	11,662	8,964	2,127	2,543
1929 . .	7,741,896	6,453,911	12,868	10,067	2,127	2,647
1930 . .	7,948,501	6,556,547	13,903	10,996	2,127	2,852
1931 . .	8,192,452	6,875,678	14,886	11,928	2,907	2,790
1932 . .	8,352,016	7,065,726	16,160	13,144	2,907	3,040
1933 . .	9,005,157	7,618,386	17,140	14,012	2,907	3,048
1934 . .	10,004,608	8,472,677	18,278	14,825	3,937	3,382
1935 . .	11,062,819	9,367,261	19,566	15,475	3,937	3,837

New Delhi Municipal Committee.

1926-27 . .	5,947,560	4,399,814	6,317	3,004	3,100	..
1927-28 . .	6,166,990	4,660,067	6,513	3,077	3,100	..
1928-29 . .	8,125,190	7,002,673	6,704	3,168	3,100	1,750
1929-30 . .	9,935,220	8,545,310	6,954	3,271	3,100	2,390
1930-31 . .	10,206,730	8,490,326	8,176	3,416	6,100	2,750
1931-32 . .	9,632,900	8,115,666	8,457	3,627	6,100	2,500
1932-33 . .	9,806,030	7,785,567	8,776	3,748	6,100	2,280
1933-34 . .	8,582,670	6,601,923	9,092	3,859	6,100	2,350
1934-35 . .	9,945,010	8,090,487	9,803	4,771	6,100	2,850
1935-36 . .	10,970,820	8,593,977	10,232	5,032	6,100	2,900

25. The present charges for energy levied by the licensees in their respective areas of supply are:—

New Delhi Municipal Committee.

Domestic supply for lights and fans .	4 as. per unit less 10 per cent. discount.
Special contracts	2 as. per unit.
	1·4 as. per unit less 10 per cent. discount.
	·8 anna per unit for first 2 million units and ·4 anna for additional units *plus* charge per KW maximum demand.
Power other than supplied under special contracts.	2 as. per unit.
Public lamps	2 as. per unit.

The Company.

Domestic supply for lights and fans . .	3·5 annas* per unit less 10 per cent. discount.
Domestic power including cooking, water-heating, radiators and refrigerators.	1·75 as.* per unit less 10 per cent. discount

*These rates came into force as from January 1937.

POWER PURPOSES.	*Installations up to 20 KW*
For restricted hour supply only excluding hours between sunset and 11 P.M.	1·5 as. per unit less 10 per cent. discount.
Unrestricted supply	1·5 as. per unit *plus* Rs. 5 per h. p. per month less 10 per cent. discount.

Special rates are given to consumers of over 20 KW maximum demand.

Shahdara (Messrs. Martin and Company).

Lights and fans	6 as. per unit less 6 pies per unit discount.
Domestic cooking and heating, etc. .	3·5 as. per unit less 6 pies per unit discount.
Power	1·5 as. per unit.

26. The Committee's inspection of the present power producing units in Delhi has led it to the conclusion that these are even now inadequate to the needs of the urban area, quite apart from any questions of extensions that are likely or which should be encouraged. The Lahori Gate power house of the Company is full to the limit and has no possibilities of extension. The New Delhi power house has ample space for extension, but is even now reaching at certain times of the year its maximum KW load and additional plant and equipment have been arranged for and will it is expected be brought into service towards the end of 1937. The Company have bought a site in Subzimandi on which, we were informed, they contemplated building an additional power house. Railway facilities could probably be provided fairly easily at this site, but the Committee have considerable doubts as to its suitability from the point of view of water supply and other circumstances.

27. A signal illustration of the unsatisfactory position in Delhi in regard to electric supply was reported to us by the Joint Water Board Engineer. The waterworks are located in the area supplied by the Company. In August, 1936, the New Delhi Municipal Committee notified the Company that they proposed to shut down their large generating set for repairs and as this involved an extra strain on the Company's plant, an arrangement was reached whereby during the temporary stoppage one high and one low lift pump only would be run. A subsequent breakdown in the New Delhi generating station rendered this arrangement more or less continuous for a number of months. Fortunately it was the monsoon season and the water demand of Delhi had dropped but if this situation had occurred in May or June, the Water Board would have had to insist on its rights under its contract, and it is doubtful if the Company could have met its obligations. Because of the Board's uncertainty regarding the assurance of adequate electric power its old steam pumping plant has been retained, and

since August last has been kept in readiness to be brought into service. Such a position negatives one of the greatest advantages accruing from the use of electric power and arises because the Company, in effect, has not been able to guarantee full supply to its consumers because of its dependence for a substantial amount of power on a producing body which itself lacks an adequate margin for its own needs.

28. The electricity supply position in Delhi in brief is that supply is at present confined to the urban area and regions adjoining. The old city with the Notified Area Civil Lines and a certain adjoining tract is fed by the Company from its Power Station at Lahori Gate, the new city and Cantonment by the New Delhi Municipal Committee from its riverside power station near the Delhi Gate of the City. Across the river the United Provinces grid system has been brought to Shahdara. The Company's power station has long since ceased to be able to meet the demand for energy arising from the Company's area of supply and for some years past the Company has been indebted to the New Delhi Municipal Committee for a bulk supply of energy which is limited only by the latter's volition to 600 KW maximum demand as a contractual undertaking. The Company would willingly take more and the object of recent prolonged but infructuous negotiations was to extract a guarantee from the New Delhi Municipal Committee of an increased supply. That guarantee the New Delhi Municipal Committee were unable to give and that inability really precipitated the question of a general survey and investigation such as that we have carried out and whose results we now submit. We discovered during our enquiries that the New Delhi Municipal Committee is actually meeting demands up to 1,000 KW at times when spare generating capacity is available and this is being readily taken; the contract maximum demand, however, is 600 KW. Not being able to bind the New Delhi Municipal Committee to meet a greater maximum demand, the Company was in turn unable to meet the demands for power made on it by various industries and would be power consumers. Under Clause VI of the Schedule to the Electricity Act 1910 a licensee is required to meet demands made subject to reasonable notice and the Company's position in the light of this provision becomes doubtful. By depending on an outside source for so substantial an amount of power they might reasonably be held to have already infringed the principle of this part of the Act. In anticipation of having to extend their own generating system, the Company had previously bought the site in Subzimandi on which another power house might be erected, but had deferred any positive steps towards its construction while the hope of a further supply from the New Delhi Municipal Committe subsisted. It was only when it became evident that those hopes were unlikely to be realised that the Company began seriously to consider the possibility of actually constructing a new generating station.

The latest stage of these discussions which has been brought to our notice was the decision of the New Delhi Municipal Committee to give notice to the Company of the termination of its agreement and that it would be prepared to supply energy to Delhi Municipal Committee at rates to be settled in due course. There seem to be conflicting views whether two years' notice is required in the case of termination of the original agreement but the essential point remains that the system on which alone the Company has been able to function in recent years is within sight of a

definite termination, and therefore the position so far as the Company is concerned, is both serious and urgent.

Special features of New Delhi Area.

29. Ordinarily one would expect to approach two electric supply undertaking working in adjoining areas from exactly the same standpoint; the assumption would be that their problems and methods followed a more or less common course and that economy combined with efficiency ruled both. This theory cannot be applied in the circumstances of Delhi. The Company is a business organisation and has been able to pursue business principles throughout. For example its transmission is overhead wherever possible. On the other hand a feature which strikes even the most casual observer is that the electric system of New Delhi was not designed solely with regard to business principles. A glance at the roadside lamps alone would indicate this. From aesthetic reasons they are of a type in which a considerable part of the illumination is absorbed by the glass of the lanterns. Similar reasons have compelled the adoption throughout New Delhi of the underground system of distribution mains. The ratio of expense, other things being equal, of underground to overhead distribution is approximately 8:5. In other words the New Delhi electric supply undertaking has been saddled with commitments imposed for no reasons originating in the needs of electric supply. It is desirable that there should be common rates throughout the urban area but common rates presuppose common original circumstances and until the anomaly created by the aesthetic considerations which have ruled in New Delhi is removed, it cannot be said that conditions are equivalent. New Delhi, therefore, is entitled to charge and would, in the circumstances, be justified in charging a higher rate than the Company. We suggest for the consideration of Government that so much of the capital of the New Delhi electric distribution system as can be attributed to aesthetic considerations should be removed from the accounts of its electric undertaking and treated as a subsidy by Government. This procedure, is, we think, at once logical and fair and would incidently conduce towards the much desired equation of rates in the two urban areas.

30. Further circumstances illustrating how widely distribution conditions differ in the two main Delhi areas are the much less density in New Delhi and the presence of such peculiar factors as the Princes Area. The import of the first factor will present itself immediately to anyone who has traversed New and Old Delhi and a glance at a map will suffice to bring it home even to persons unacquainted physically with the areas. The bulk of the Company's demand arises from an urban area which is one of the most congested in northern India; in other words the number of connections served by say half a mile of distributing main is very high, a circumstance obviously leading to saving of costs in distribution. In New Delhi, on the other hand, the circumstances are precisely the reverse; the number of individual connections served for half a mile of distributing main is probably the lowest in India and the adverse influence on overhead costs is immediately apparent.

31. It may not be so immediately clear why the Princes Area should affect seriously the costs of electricity distribution, but the small table below deserves careful consideration.

Connected load and consumption of energy in some residences in Princes Area in New Delhi during 1932-33-34-35-36.

Premises.	Recorded connected load in KW	Units consumed.			
		1932-33.	1933-34.	1934-35.	1935-36.
Bikaner House . . .	109·00	18,437	10,702	13,741	12,578
Hyderabad House . . .	72·00	414	98	5,035	9,809
Baroda House . . .	67·5	120	4,353	15,797	4,431
Kashmir House . . .	49·26	24,540	42,540	30,759	1,684
Darbhanga House . . .	22·124	6,206	3,557	8,251	6,323
Travancore House . . .	20·72	1,611	1,745	5,471	1,090
Patiala House . . .	14·16	..	3,385	3,278	2,673
Jind House	11·46·	286	595	784	555

32. The capacity of some of these installations is very extensive. An ordinary consumer with an installation of 100 KW capacity on a load factor of 20 per cent, which is the lowest that could seriously be taken, would consume 175,200 units, while even at a load factor of 5 per cent. he would consume 43,800. Actually Bikaner House with a recorded load of 109 KW has never so far consumed more than 18,500 units. It should be added that column 1 gives only the recorded connected loads and that we believe that the load actually taken in practice is considerably higher, which goes to emphasise the wide disparity between the circumstances of these Princes' palaces and the ordinary features of a consumer's demand. We have dwelt at some length elsewhere on the importance of spreading the load if economy is to be secured and it will be realised how the circumstances of the Princes Area must contend against the realisation of that desiderated condition.

Concentration of generation and direct supply to distributing licensees and large consumers.

33. Delhi is a small area. One fundamental principle of electricity supply is that if rates are to be brought down, generation should be concentrated and on a larger scale. From this point of view Delhi's present position with two power producing units is already uneconomical and unsound, while the possibility of yet a third power-producing unit being installed is, in the circumstances of Delhi, a contingency which should be avoided at all costs. On this, the testimony offered before us was unanimous.

34. Broadly speaking the object of an electrical supply undertaking should be to distribute its load in kind and in time over the 24 hours. To the degree to which it succeeds in equalling out the demand on its power, it will succeed in reducing its cost per unit. Theoretically, therefore, a desirable system would be one organisation responsible for the whole field. The problem, however, is not quite so simple and a distinction enters, firstly between generation and distribution, and secondly between the large industrial power loads and the smaller and more varied domestic loads.

35. The first distinction is fundamental to any appreciation of the problems of electricity supply. Generation can be concentrated, distribution by its nature cannot. A consumer on the outskirts of the supply area is as much entitled to supply as one next door to the centre of distribution, and at the same rates, but he is in fact considerably more expensive because of the lines that have to be run out to supply, say, his eight light points and one fan. Thus it is at the generation end that the real possibilities of economy through concentration and limiting of overheads enter. The generating concerns produce a commodity which is transmissible in bulk to a few consumers. The distributing authorities have to distribute in retail at low pressure to a multitude. The problems of generation and distribution are, therefore, widely different and the experience and skill required in the two are by no means identical. The one in fact is a purely industrial proposition in which the economies, etc., of large scale industry enter; the other is essentially a problem in which the wide variety of reasonable—or unreasonable—needs, desires and prejudices of the various classes in the community have to be borne in mind and catered for.

36. The distinction between the large industrial demand and that of the ordinary individual consumer lies in the fact that an efficient industrial undertaking of sufficient size might be able to produce its own electric power at as cheap a figure as that at which any central body could supply, with the further guarantee that its source of power was thereby completely under its own control. The taking of power from an outside source would lead to certain conveniences, but the question which an industrialist puts to himself is whether these conveniences are not offset by certain added liabilities and dangers, *e.g.*, that he has to put himself in outside hands. Thus the question is, whose these hands are? and this issue came markedly before us in the shape of the reluctance of representatives of industrialists to contemplate taking their power requirements from a body on which their interests were not assured of adequate representation and expression.

37. From the above considerations follows the first of our main conclusions, *viz.*, that if there is to be any possibility of Delhi securing a really cheap and abundant supply of electricity, generation must be concentrated at a single source. This in our opinion is fundamental and everything stands or falls by it.

38. Admitting such concentration, the simplest and most obvious scheme of distribution would be for the central generating authority to supply in bulk to distributing licensees from whom consumers would draw. Here, however, we come up against the consideration dealt with in paragraph 36. If rural economy is to be secured all generation must be concentrated at one source. On the other hand this means that a substantial part at least of the industrial load must also be brought in if overhead costs, etc., are to be spread sufficiently to make real economies possible. The industrialists' reluctance, amounting to refusal, to put themselves for power requirements in the hands of outside licensees means that under the simplest system the full load would not accrue to the central generating authority and the maximum of economy and development would be missed. We have gone long and anxiously into this problem in an endeavour to discover a solution, but the only feasible one that presents itself to us is that the central generating authority should be empowered to supply energy direct in bulk to large consumers. These consumers could be represented

on the managing body of this central generating system, and with direct supply and representation on these lines thus ensured we think that there would be a reasonable prospect of securing at least a substantial part of the industrial load.

It will, we anticipate, be one of the main objectives of the new authority to secure for the central station the whole industrial demand.

39. Representatives of the Delhi Municipal Committee who appeared before us opposed strongly any scheme of direct supply to industrialists or even to the Company, their objections being based partly on considerations of prestige and partly on a desire to secure to the municipal bodies as distributors all profits that may accrue from distribution. We appreciate the origin of such views and the logic behind them. On the other hand considerations of prestige and strict logic must give way to the actual interests of the ordinary consumers; for it is they who would benefit by the accession of the industrial load to the central generating authority; unless that load was secured, it would not be possible to achieve the maximum lowering of rates which it is the desire of everyone to bring about.

40. Nor is it as if there were anything novel or undesirable in this principle of direct supply to large consumers. Precedents exist in many places, not least India itself; the North Western Railway, Lahore, is supplied direct in bulk by the Punjab hydro-electric authorities without having to take through the distributing licensee, and the Tata hydro-electric licence specifically permits direct supply to consumers of not less than 500,000 units per annum.

41. We have obtained from the Tata Hydro Electric Agencies, Ltd., a copy of the bulk licence under which their hydro-electric undertaking operates, and suggest this as a model which the licence to be issued to the Delhi Central Authority might follow. In order to protect the distributing licensees in the area of supply, the licence provides that energy shall be supplied only to other licensees for their own purposes and in bulk and to factories within the meaning of the Indian Factories Act, and to any railways previously approved by Government, whose average computed annual consumption is not less than 500,000 units.

We have obtained also from the Government of Madras specimens of the licences issued by them to various distributing licensees obtaining energy in bulk from the Government's undertaking. These prescribe specifically that any prospective consumer within the licensed area having a connected load of 150 H.P. or more may, if in the opinion of the Government it is deemed necessary, be supplied with electrical energy in bulk at high tension by Government direct. The Madras licences also in prescribing tariffs contain a provision that the maximum demand charge for large textile mills and factories guaranteeing an annual consumption not less than 240,000 units should be at a figure lower than that of the specified standard tariff.

42. We have adopted the limit of 500,000 units taken in the Tata model, for we think that expression by units is preferable and the figure of 500,000 reasonable. The Company's representatives opposed the whole principle of direct supply from the central authority to large consumers for reasons indicated already and also suggested a KW basis instead of a figure in

units. They were prepared reluctantly to go down to 500 KW as a limit above which direct supply might be permitted. They urged that quotation in units might mean that a consumer with a small installation might run it on a long hour basis and so achieve the limiting figure in units and thereby become entitled to direct connection. Moreover quotation in units might mean frequent changes in eligibility and therefore complications in relation to mains. The KW basis, on the other hand, would be free from such fluctuations since a change in the actual capacity of an installation would be of comparatively rare and always amply foreseen occurrence. We admit a certain validity to these arguments but think them outweighed by the practical consideration that concession should go by consumption, for which we have the actually operating Tata licence as an example. Moreover we do not anticipate that the concession would be extended on a single achievement of 500,000 units. The phrase used is "average computed annual consumption" and we would see no objection to specifying that this average should be on the results say of three successive years. This would give ample forewarning to those concerned of a possible change in the list of those entitled to direct supply. On the actual dimensions of the limit we have only to say that this imposition would not mean any deprivation to the Company since at present they have only one consumer of such dimensions, the Joint Water Board, whom in any case they could not expect to keep under the new arrangement, and even this and the next largest consumer, the Broadcasting Studio, they could not carry at all had they not hitherto received the substantial extra power from the riverside station.

Principles governing the formation of a Central Generating Body.

43. The object we have set before ourselves is to work out a scheme which would enable an abundant supply of electrical energy to be put at the disposal of all classes of consumers in Delhi province at the lowest possible rates. The first step to this end is, as we have indicated, to concentrate generation, and we repeat, such concentration is an absolutely vital element in any rational scheme. Thereafter, however, keeping in view the main purpose above mentioned, it is essential to ensure that no dissipation of profits or economies takes place in the interval between generation and distribution. Hence our proposal that generation be in the hands of a body formed for that purpose on a strictly no-profit basis. It would be necessary to give such body a legal existence and personality so that it could deal direct with licensees or its large consumers and in general exercise the functions we contemplate for it.

44. Legislation to set up a body such as that we recommend would be undoubtedly a lengthy process; the legislature's sessions are regularly congested and it might well be difficult if not impossible, to find time for a measure of purely local concern though, we suggest, of considerably more than local interest. It is because of this extra-provincial interest that procedure by legislation might be even more protracted than ordinary considerations would indicate. Delay is a serious objection from our point of view for if the scheme we have set forth is to take proper shape, it ought to be initiated almost immediately whereas if the legislature were invoked there seems little likelihood of a central generating authority being constituted or able to function before the spring of 1938.

45. The Punjab Chamber of Commerce and the Company recommended that the new authority should take the form of a shareholders' company with rupee capital. The former body declared that while they had no objection in principle to the setting up of a statutory authority on the lines of the Electricity Board in Great Britain, they had rejected this solution because of the difficulty of finding men with the qualifications necessary for directors. We have avoided the solution of a rupee company, as we feel that the proper course is to divorce electrical generation from the profit aspect and no shareholders' company can ever be proof against the pressure to pitch its rates so as to maintain a certain level of profit. We cannot repeat too often that generation of electrical energy is a public utility in the fullest sense, but one requiring expert and concentrated management. Hence its governance by such a body as that we recommend seems the more satisfactory expression of the two principles which should be represented, firstly actual efficiency of operation, secondly the securing of the lowest level of rates.

46. Suggestions have been made that the management of Delhi electricity supply might be entrusted to a joint board which would control water and sewage administration also. We do not favour any such composite control. An association of this sort is justifiable only where there is substantial connection or similarity between the subjects of administration thus brought together. The connection between water and sewage is obvious but the problems of electricity administration on the technical side are totally different and the relation between electric supply and its two proposed associates is really only that of buyer and seller. We can understand how a recommendation of this sort arose. Delhi is a small area and the ratepayers are concerned with the supply of amenities under all three heads. But something more than this is required before a common management should be imposed.

47. We have investigated other methods of bringing a central body into being and recommend the formation of a company limited by guarantee and without share capital and we attach as appendices VIA and VIB to our report a draft memorandum and articles of association for a company of this kind. These will presumably be scrutinised by the legal advisers of Government in the event of our suggestion being adopted but we have embodied these in our report in order to provide the utmost assistance and the saving of time. We invite particular attention to the provision for representation of industrial consumers on the Central Generating Authority; we consider it essential that such consumers should have an effective voice in the direction of its affairs.

48. Any company formed would have to obtain a licence under the Electricity Act, (Act IX of 1910) before it could supply energy and section 3 of the Act provides for the attachment to the licence issued, of conditions which the Company must satisfy. Among these conditions could be and should be the prescription of maximum rates which the generating body may charge.

Probable future demand by stages.

49. Our estimate of the probable demand for electrical energy in the two areas of supply in 1940 and 1945 will be found as Appendix VII. We have also shown, for the purpose of comparison, the actual demand

in 1935. In preparing the estimate we had the assistance of the technical officers of the licensees and obtained details of the probable sewage and water pumping loads from the Superintending Engineer, Health Services, With regard to the estimated demand for large industrial power purposes, we were fortunate in having as one of our members one of the leading industrialists in the province and have drawn freely on his knowledge and experience of industrial requirements.

50. In the Company's area of supply the consumption of energy for domestic purposes was 4,089,043 units in 1935. 1936 showed an increase of 15 per cent. and there is still a large field for further development of the domestic supply in the old city. Elsewhere we are recommending substantial reduction in the charge for energy for domestic purposes and this we feel will give the necessary incentive to householders to make greater use of electricity. Our estimates of consumption for domestic purposes in Old Delhi for 1940 and 1945, namely 6,000,000 and 7,500,000, are in our view in no way over-optimistic.

51. We have felt it necessary to be rather cautious with regard to the consumption for domestic purposes in New Delhi as the circumstances in the new city are probably unique. A large part of the city is occupied for a part of the year only and practically all premises (except those occupied by the poorest classes) are already connected to the electricity supply system. At the same time we feel there is some scope for development of domestic supply, particularly in the direction of the use of domestic heating and cooling appliances. The city continues to expand and there will undoubtedly be increased demands for electricity for domestic purposes. We have taken the consumption in 1940 and 1945 at 2·2 and 2·5 million units respectively against 1·82 million in 1935.

52. We estimate that the probable demand for energy for power purposes in Old Delhi for general users other than large industrialists will increase in 1940 and 1945 to six and eight million units respectively against a consumption of approximately 3·75 million units in 1936. The Company's representatives have informed us that owing to the uncertainty prevailing with regard to additional power supply for the reasons indicated in para. 28 they have, for some time past, had to refuse numerous applications for supply of energy for power purposes. They assure us that as soon as energy can be obtained at cheap rates, considerable additions to the power load can be confidently anticipated.

53. We are unable to foresee any great industrial development in the New Delhi area, and for that reason have felt it necessary to take a conservative view of the demand for general power in that region. The present demand for power purposes is approximately 1·2 million units per annum and we consider that demand in 1940 and 1945 may be estimated at 1·5 and 1·8 million units respectively.

54. As discussions elsewhere in this report will have indicated, the advent of a large industrial load to the central generating authority is attended by a variety of considerations which make a positive expression of opinion difficult. On the general aspect of readiness to use electric power, we are confident that given a cheap supply, many factory-owners would, without hesitation, readily turn to electrification. One large industrialist at present driving his factory electrically has informed us that he would be prepared to consider shutting down his own generating plant and taking power from a central source if favourable rates were

given. It is on this point of favourable rates that difficulties arise, for the industrial user is apt to consider, as the standard of a favourable rate, one which a producing authority would look upon with some hesitation as concessional. We have discussed elsewhere the possible attractiveness to industrial users of the rates we have evolved, and the position must inevitably remain to some extent conjectural. For this reason while we have shown large industrial consumers in our 1945 estimates, and we consider that some and possibly most of the 1945 industrial demand will in any case accrue, we do not offer our figure of 25 million units as a prophecy but as an indication of what may possibly eventuate. Our estimate of consumption for 1940 is, however, on a more positive basis and we think it could be said that by that year there would exist a demand from factory-owners amounting to 6 million units per annum (equivalent to a connected load of 1200 KW with about 57 per cent. load factor).

55. The Delhi Factory Owners' Federation in their statement submitted to us declared that factories now using oil and steam engines for generating power on grounds of high cost of energy in the company's area would willingly take their requirements from a central generating body if it could supply power "at an economical rate—say not more than 6 pies per unit in any case". The maximum rate we propose for supply to factories and other power users whose average annual consumption exceeds 500,000 units is 0·5 anna per unit. And we anticipate that where special circumstances warrant a supply may be given at a substantially lower figure. We ascertained from an individual prominent industrialist that in one of his concerns it would pay him to take power at 6 pies in view of the savings which the use of electric power would make possible, *e.g.*, in water. We think, therefore, there is some justification for the belief that an appreciable number of industrialists would in fact in time—and perhaps soon—take their current from the central generating authority we propose.

56. For the reasons given in paragraph 53 we have not allowed for any demand from large factories in the New Delhi area.

57. Electrical energy is used for pumping unfiltered water for irrigation purposes; involving a present consumption of energy of 2·9 million units per annum. We were informed that installation of additional pumping plant is under consideration. The additional consumption of energy will in 1940 amount to 900,000 units per annum and we anticipate by 1945 a further increase in yearly consumption of approximately 300,000 units bringing the total up to 4,100,000 units per annum.

58. The pumping plant of the Joint Water Board is at present partly driven by electric power and we were informed that as soon as an ample and assured supply of energy is available, all pumping will be done electrically. From the information furnished in regard to the plant installed and the periods of use we estimate the consumption of the pumping plant at 3·92 million units in 1940 and 5·4 million in 1945. The new pumping and disposal installations under construction for dealing with Delhi sewage will be operated electrically and we estimate a consumption of 5·34 million units by 1940 and 6·24 million in 1945.

59. The consumption of energy for public lighting in 1935 was 1·6 million units. We are of the opinion that considerable extension of road lighting will be undertaken to meet modern conditions and to keep pace

with the development and improvements contemplated in Old and New Delhi. We estimate that consumption of energy for public lighting will increase to 2·1 and 2·35 million units in 1940 and 1945 respectively.

60. A small increase in consumption of energy for traction purposes is anticipated. The Company have informed us that it is the intention to extend the use of trolly buses which consume more energy than the trams at present in use.

61. In our estimate of consumption we have not included any demand for pumping water from wells or other rural purposes. There are in all 4,850 wells in the province and it is probable that in some areas electrical energy can be utilised for well pumping but as we have no certain information, we have considered it advisable to make no allowance for energy used for this purpose. We have no doubt however that the possibility of developing load from this source will not be overlooked by the distributing licensees and that the local authorities will do all that is in their power to facilitate and encourage the use of electrical energy in the rural areas of the province. The accession of a rural load would undoubtedly contribute to the improvement of the load factor of the system.

62. The graph opposite has been prepared to show pictorially the anticipated load on the generating station throughout the 24 hours of a day at each stage of development. The first and second stage curves are roughly similar in shape, but the third stage curve is widely different. This difference is due to the introduction of the industrial load which has the effect not only of substantially raising the peak demand but of considerably spreading the general demand. Thus while the two lower curves have only one marked peak and one subsidiary peak, the third curve has one peak with three broad blocks of substantial demand. An interesting detail is the recession of the main peak from 7 P.M. in the first curve to 6·30 in the second and 6 in the third. This again is the reflection of the presence of the large industrial load, while the much deeper intervals between the blocks in the top curve indicate the same feature in another way; *i.e.*, when the industrial demand is diminished the total load on the station drops substantially and at once.

Estimate of Capital Expenditure by stages.

63. In Appendix VIII will be found set out in detail an estimate of the capital expenditure involved by our proposals. This might be summed up as follows:—

	Rs.
Present assets to be taken over from the N. D. M. C. (including extensions under order)	17,88,487
Present assets to be taken over from Company	68,115
Extensions first stage to be begun not later than 1938—	
H. T. distribution	4,85,000
Extensions second stage to be begun not later than 1939—	
H. T. distribution	2,25,000
Plant, etc.	8,10,000
Rail Siding	2,10,000
River Training	1,50,000
Extensions third stage (1941-2)—	
Plant, etc.	7,60,000
Working capital	1,00,000
Total	45,99,602

In other words for the whole scheme of development we contemplate a capital provision of Rs. 46 lakhs. In the appendix we have shown in some detail how those various provisions were reached and in general we have tried to lay down a scheme of development which while including everything that is essential, would at the same time be both logical and economical. We start from the conclusion reached very early in our enquiry that the present riverside power station represents the only really suitable site for a generating station in Delhi and that therefore the generation of electricity should be concentrated there. A second and very early conclusion was that the present plant of the Company should not be considered as a possible element in the future generation system on account of its inadequacy and the expensiveness of oil-engine operation under present conditions. The Company's largest generating unit is of 1030-KW only, a size which removes it from any usefulness to the new central generating station even for standby purposes. Oil fuel in Delhi at the time of writing is Rs. 94 per ton at the Company's station and the use of such generating units would entail very great sacrifice of economy. We have been informed, however, that in the event of the Company deciding to take its supply from the Central generating station, it will probably wish to retain its own plant for some time as a safeguard and standby.

64. An essential preliminary to any proposals for expenditure on development is an investigation and presentation of the estimated demand, and this we have done in appendix VII. We have indicated there the contingent aspect of the industrial demand, and for this reason we have set out our development proposals in stages so that an interval will be afforded for the investigation of an assured demand before each subsequent stage is undertaken.

65. A further point is the actual accommodation available in the riverside power house and interests of economy and efficiency alike demand that changes and developments be made with the least possible disturbance or recourse to fresh construction. Clearly if the riverside power house is to be taken as the generating centre, the efficient power units now installed there should form our plant nucleus and we propose that the additional plant under order (whose exact dimensions have been to some extent determined in consultation with us) should be taken over also. Starting therefore from these conclusions, our first step has been to value the plant now or about to be installed in the riverside power station, estimate with reference to our view of possible consumption development, for how long this plant would suffice, and make proposals for extensions which would fit in with the growth of demand and with the passage from effective usefulness of some of the older elements. Thus we should secure economy of space in the power station as well as of operation. We saw no reason to recommend the installation from the outset of all the stages we have suggested. This would have meant a capital expenditure and consequent interest liabilities which would at the outset not have been covered by adequate returns from consumers. It will be observed that our third stage should be taken in hand in 1941-42, and broadly our proposals may be said to cover the next decade. We have not chosen to look farther ahead than this, nor would any such endeavours at prophecy have been fruitful or justifiable. The production of electrical power is an industry in which developments of technique are of regular occurrence and it is not safe to look too far ahead in a world that is rapidly

and constantly changing. To do so would be to run the risk of tying Delhi overlong to a particular system or methods.

66. We do not propose to discuss here the individual details exposed so fully in the appendix and we trust that the explanatory notes there will give complete information on the methods of valuation we have adopted. These methods, we think, have produced a just statement of the present position. Since our proposal is that the new generation station should conduct H. T. distribution, it follows that the H. T. main laid by the Company between its station and the riverside station should be taken over by the new authority, and we have provided for this. Similarly the rationale of the distribution element in the extension proposals follows also.

67. We would add a word of comment on the provision of 1½ lakhs for river training works. The presence nearby of abundant water is an essential prerequisite to the satisfactory running of this river bank power house. The vagaries of the Jumna have, in the past, given cause for anxiety and have necessitated training works, and with the much greater demand we anticipate, it is all the more important that the river should be, as it were, always at our call. We have been informed that the Public Works Department themselves contemplate further training works amounting to Rs. 3 lakhs and since the generating station would benefit considerably from these training works, a debit to it of part of the cost is reasonable. Indeed some such works could be called an essential feature of the scheme. Although we think a contribution by the generating station justified, we do not put forward Rs. 1½ lakhs as to be a positive estimate of the amount or the quota which the station should furnish. On the amount we have no positive estimate before us but merely a round figure of Rs. 3 lakhs, while on the quota question, though we have for simplicity of calculation and in order to avoid anything of the nature of overoptimism, taken it as 50:50, we think that the actual fraction justly debitable ought, in fact, to be lower.

68. The Rs. 2·1 lakhs set against 1939 for a railway siding and the connected provision of Rs. 75,000 for coal handling and transport plant represent a conclusion that the cartage costs prevailing in New Delhi are at a level which would justify the construction of a special siding even for a distance of 3¾ miles, on grounds of expense apart from convenience. We understand that the New Delhi Municipal Committee had already in contemplation the provision of siding facilities and we certainly think that unless hydro-electric power is obtained such facilities will be necessary when demand on the power station reaches the figure we have estimated in the second stage of development. We have estimated the capital cost of the siding on rates adopted by the railway authorities for assisted sidings, laid with 90 lb. rails, and have made provision in our estimates accordingly. We think, however, it will be possible to make some saving on this item if lighter or second-hand rails are used. We also consider that if arrangements are made to haul the coal wagons from the broad gauge main line to the power station by means of an electric locomotive or tractor which could be used at times of light load, economy in cost of handling the coal will be secured. The provision we have made for transport facilities will, we feel sure, be adequate, indeed some saving may be possible, but the matter will no doubt, be critically examined before the work of constructing the siding is taken in hand.

69. The H. T. extensions indicated for 1939 in item VI of the Appendix are to some extent contingent since, as the notes show, they have in view distributing mains to the new industrial area which we have shown on the map. We do not know whether any decision on the development of this area has yet been taken but presumably the Improvement Trust will consider this point among its other schemes. It seems to us clear however that if any serious industrial development does take place in Delhi the various units will tend to concentrate in suitable neighbourhoods and if they are to have the fullest and most economical provision of electrical energy possible, direct H. T. mains will have to be led to such neighbourhood and to the large power users there. The provision of such facilities would on the other hand act as an inducement to concentration.

70. When the extra plant proposed for the second extension (whose effective output, we think, should not be less than 6000-KW) is installed one of the existing 600-KW units should be removed and disposed of to the best advantage. The total capacity of the generating station after completion of this extension will be 15600-KW and the plant will be capable of meeting demand up to 10000-K.W.

71. When the plant contemplated by the third stage is installed, some minor extension of the power house building will be necessary but accommodation for the proposed additional boiler can be secured by the removal and disposal of the two existing boilers, each of 18,000 lbs. evaporation; for by that time these will have ceased to have useful assets. The second 600-KW reciprocating set can also be removed and set free for the 6000-KW turbo-alternator proposed. If still further additions to the generating station are later found necessary accommodation can be set free in the existing building for additional steam-raising and generating plant of 6000-KW output by the removal of the boiler of 20,000 lbs. evaporation which was installed in 1929 and also of the 1500-KW turbo-alternator; both these units will by then be obsolete.

72. When the third stage development has been completed, the plant in the generating station will comprise:—

Boiler Room—

4 Boilers of total normal steaming capacity of 202,000 lbs. of steam per hour with overload capacity up to 250,000 lbs. of steam per hour.

Turbine Room—

	KW capacity.
2 Turbo-Alternators each	6,000
1 Turbo-Alternator	4500/6000
1 Turbo-Alernator	3000
Total Capacity	21,000

The 1500-KW Turbo-Alternator set will not be an effective unit and can be removed to make way for a larger unit if required for further extensions. Its output has not been included in the figure of total generating capacity.

73. We consider that a generating station of this capacity will suffice to meet all demands for energy which are likely to arise in the province between now and 1950.

74. The Punjab Chamber of Commerce, while cordially supporting the idea of a single central generating authority, suggested that the generating plant belonging to both the present licensees should be acquired and

in addition all plant units producing a minimum of 250-KW in possession of private owners, such plant to be acquired on a valuation of which the criterion would be not only KW output but also capacity "for generating energy at an optimum cost". We have already dealt with and dismissed the possibility of taking over any of the plant now in possession of the Company and we can see no justification for saddling the new authority with the cost of a variety of plant units none of which could be fitted into its scheme of operation. It might be, and indeed was argued before us that the taking over of the plant would act as an inducement to private producers to add their load to the central station. In our view this is to approach the problem from the wrong end. It is undoubtedly desirable to bring in as much load as possible but the proper approach in our view is first to seek concentration not only in plant but in capital expenditure and aim at through that concentration producing such conditions of efficiency and cheapness as will attract users of energy in the province. Not all the inducements are on one side; for if a cheap and reliable supply of energy from a central source is available, an industrialist who takes it and gives up his own plant is saved anxiety regarding varying fuel costs, supervision, ill-distributed load, etc. We are confident that logic, simplicity and efficiency alike are in favour of the attitude we have indicated above. It is not possible to contemplate an efficiently concentrated unit being burdened with a collection of plants of varying age, size, type and usefulness.

Estimate of average cost per unit for various stages.

75. We have discussed in Appendix VII our estimate of the consumption that may be anticipated for Delhi. We have considered in Appendix VIII the capital expenditure necessary for plant and equipment, distribution, etc., to cope with that demand. These two preliminary investigations enable us to approach the third and most important element, namely, the estimate of the annual expenditure and average cost at which energy can be supplied. This has been set out in considerable detail in Appendix IX.

76. Of the three stages set out in that estimate the first deals with the present position and is more or less merely a starting point. For the reasons indicated in our discussion of the consumption estimate the third stage to some extent is conjectural, since the figures arrived at there depend on the accession of the full industrial load. We would invite, therefore, main attention to the estimates for the second stage and the cost figure of ·4018 anna per unit which emerges. In both the second and third stages it will be observed that the cost of coal accounts for over 50 per cent. of the total annual expenditure, in the third stage substantially so, and in the Appendix a note is given on the coal question. It will be observed that we have allowed for an increase in the price of coal and on indications at the time of writing our precautions are justified.

77. It has been our desire throughout this report to avoid facile optimism and to present if possible our estimates, etc., from an aspect in which any change that might ensue would be for the better. We have followed the same principle in allowing for the increase in coal cost. The high proportion which coal cost bears to the total expenditure indicates the dependence of a steam station on this particular raw material, not only from the point of view of its actual functioning but in the level

of rates it will have to adopt. This predominance of coal costs is an argument in favour of the adoption, if otherwise possible, of a system free from this dependence on a distant commodity of high and fluctuating cost—*e.g.*, of a hydro-electric link, a topic we have discussed elsewhere.

78. No other single annual cost item is really comparable with the coal figure, and the only substantial elements are interest charges and depreciation. These points will be found fully discussed in the comments in the Appendix. We have thought it best in order to produce a true picture of the position of the central generating authority to base depreciation on strictly calculated lives and replacement cost, not on taking-over cost. The problem which the generating authority will have to face and for which its finances will have to provide will be that of after a certain period replacing certain articles for which the cost payable will be actual market figures. This policy has slightly steepened the depreciation provision but we are satisfied that it is the correct one to adopt. The absence of provision for Chairman's or Directors' remuneration and the moderate dimensions of the sums provided for management and audit may be given a word of comment here. Under the scheme we have in mind the administrative side of the central authority would be essentially simple. The bills it would issue and collect, though possibly large in amount, would be very few in number, possibly, at the outset at any rate, not even reaching double figures. Compare with this the position of an ordinary licensee issuing monthly bills by thousands for small amounts, and the difference in staff and audit requirements is at once apparent. The plant again, though large and valuable, will be simple and concentrated and be free from any complications of attention, renewal, etc.; that a mass of minor or more detailed units might involve. Thus both on the executive and administrative side the system should not call for elaborate staffs or provision and we have proceeded accordingly.

79. We have already referred to the capital provision made for river training works and in this appendix we have provided for the annual maintenance of such works on the same tentative distribution ratio of 50:50. Any change downwards in that ratio in favour of the new generating body—we cannot conceive of any case for a change upward—would of course influence the cost figures displayed.

80. We have shown no specific provision for income-tax in our estimates and *ex hypothesi* this element should be nil since the company we propose will be on a no-profit basis. We would recommend that if possible some means be devised in the setting-up of the company to free it from income-tax inquisition, and we have no doubt the income-tax authorities themselves would welcome some such provision. If this body could be classed as a local authority, such an exemption would be obtained, but we are doubtful of the practicability of this expedient and leave the point for the consideration of the Government.

81. The rate of rent and allied charges to be imposed on the power house by the New Delhi Municipal Committee is difficult to predict. We believe that the land on which the riverside power station stands was for the most part reclaimed and practically created by Government engineers from the river bed and we suggest that for this reason, if for no other, the New Delhi Municipal Committee would not be entitled to pitch its rental figure at any serious elevation. Moreover, since our company would be on a no-profit basis with the single object of supplying energy at the lowest cost, every circumstance standing to lower its rate would be

reflected to its consumers, and consequently the New Delhi Municipal Committee as one of the principal customers would benefit through that rate in its forbearance from excessive rental charges. This again is not a point on which we can make a final recommendation, but we commend it to the consideration of Government.

82. The unit cost of ·4018 anna resulting from our estimates compares most favourably with the present production cost of either the New Delhi Municipal Committee or the Company. The latest accounts (1935-36) of the former body show their cost per unit sold as 1·2 annas while the corresponding figure for the Company for 1935 was 1·37, and 1·25 for the first nine months of 1936. As we have been at pains to show, we have tried to present the expenditure aspect from its most conservative side, and given reasonably favourable conditions, it may be that even on the consumption figures adopted our rate of ·4018 may be bettered. As we indicated earlier in our report, electricity generation is essentially a region in which the economies of large scale production play a large part, and leaving aside the possibility of large industrial demand accruing, the ordinary development that can be confidently anticipated should bring about a further lowering of the unit cost after 1940.

83. In their memorandum to us the Company suggested various methods of securing concentration and economy in generation. Of the unit generation costs resulting from their schemes the lowest was ·5 of an anna. The economy secured by our proposals will be clear from this fact.

84. We have observed during our enquiry the unfortunate prevalence of exaggerated ideas regarding the extent to which the cost of generation can be reduced. For example the Delhi Municipal Committee considered the cost of production not likely to exceed three pies per unit and had apparently been advised that if they were to instal their own plant their cost of production would not exceed 3·66 pies. Acting on this they informed us that the critical rate at which they could take power from an outside source would be ·66 anna per unit. The elaboration of our enquiry and the figures resulting from it as exposed in Appendix IX will, we think, show how illusory these ideas are. The figure quoted in our appendix is the lowest safe estimate that could be quoted and it would be doing a disservice to the Delhi public if over-optimistic ideas of possible cost were to be widespread. We believe that part of these misconceptions is due to an impression that the cost per unit generated in Cawnpore had been reduced to as low as ·15 anna a unit. Actually their working costs per unit generated (*i.e.*, bare works cost without interest, depreciation or other charges for service of capital) during the years 1933, 1934 and 1935 were ·344, ·301 and ·285 anna respectively.

Possibility of linking Delhi with U. P. or Punjab hydro-electric systems.

85. We have already referred in paragraph 14 to the fact that the systems of adjoining provinces have already impinged upon Delhi in the shape of the U. P. grid supply in Shahdara, and every one who has reflected on the electric supply position in Delhi will have thought of also the possibility of linking up Delhi generally with water power systems of the adjoining major provinces. If such a supply can be obtained in adequate amount and at a resonable rate, it should be taken, for in our view, the day of numerous isolated generating systems is over and the interest of the country as a whole as well as of individual consumers lies

in encouraging the spread of systems of wide range. From such information as we have been able to obtain, the U. P. grid offers little prospect of satisfactorily coping with the Delhi demand for it can spare energy in sufficiency only for a part of the year. This means that for its supply at other times Delhi would have to look to a full installation of its own and no saving in capital outlay would be possible. Thus the U. P. grid could function in Delhi usefully only as a purely emergency resort.

86. The case is far otherwise however with the Punjab. From such information as we have been able to gather, it seems clear that this system is at present underloaded and has still an ample supply of energy for disposal. Consequently the accession of the Delhi load would help considerably the Punjab load factor in what is as yet an infant scheme and considerable betterment of the financial position of the hydro-electric undertaking can with confidence be anticipated. It may be urged on the other hand that the long lead, over 200 miles, would produce unjustifiable expense to the Punjab, unless the rates charged were at a level unattractive to Delhi. We do not share this view; in our opinion the accession of Delhi and the consequent erection of a transmission line passing through hitherto unelectrified country would contribute substantially to developing as it were an electric consciousness in the regions traversed; and we understand that a development of this nature is one which the local authorities have much at heart. There is the other argument that it would be dangerous to put Delhi's electrical needs at the mercy of a long transmission line and of another province. We discussed the matter at length with the Chief Engineer, Punjab Electricity Department and so far as we can see anticipations of frequent interruption have very little justification, while we see no reason to attach undue importance to the fact that Delhi would in a large measure be dependent for its supply on an outside authority. This is a commonplace of electric supply in all countries, and as we have suggested more than once, the parochial outlook, out of place anywhere in the modern world, is most so perhaps in connection with the supply of such a commodity as electricity. On the other hand we agree that an adequate standby of some kind should be kept and for this purpose the plant now in the riverside power station plus that already on order should provide full assurance against lack of continuity of supply due to interruption on the hydro-electric link. If such a link were made it would reduce the capital cost incurred in plant extensions under the scheme in Appendix VIII though, of course, such elements as the high tension distribution extensions would remain unaffected.

87. As a result of our discussion with the Chief Engineer, Hydro Electricity Department, the possibility of a Delhi-Punjab link was considered by an expert committee which had been called for the 20th January in Lahore to consider various other aspects of the Punjab system. This Committee consisting of Sir William Stampe, Mr. Howard and Mr. Thomas also went into the suggested Delhi connection and, we believe, reported favourably on the question of principle. The attitude of the local Government is, we understand, that a departure of this importance should not, in view of the near approach of provincial autonomy, be taken without the cognisance of the new Provincial Government, and therefore no positive orders can be anticipated for a few months. Meanwhile we have examined the position, and working on the basis of cost calculations already exposed and allowing a standby station consisting of the present plant in the New Delhi Power Station plus that under order, on the assumption

that the steam station may be called on to carry all the load for five days during the year and that one boiler will be kept under steam during the whole 24 hours of 365 days per year, we find that the rates at which it would suit Delhi to take Punjab energy would be in the neighbourhood of 2½ pies per unit; this would produce an average selling price per unit of ·3692 anna. Taking our steam figure of ·4018 as a standard, the highest rate per unit at which we could recommend the taking of Punjab energy is 2·8 pies.

88. We would urge here the importance of the figure of coal cost we have taken and the discussion on this point in Appendix IX. We believe the figure Rs. 15-3-8 per ton to be a safe figure and this point of our calculations may be of particular interest to the Punjab authorities in considering this question and the justice of the steam cost rate we have adopted.

89. We would prefer, however, to view the possible Punjab link from the aspect of the annual demand contemplated in our third stage, *i.e.*, 74 million units. It is not possible to separate the desirable rate from the anticipated consumption, for it is one of the peculiarities of electric supply everywhere, and perhaps particularly in Delhi, that a substantial power-using element remains independent of a central supply source and will enter only on rates it considers suitable. Once it does enter, however, the magnitude of its demand exercises a beneficial influence on the whole undertaking.

90. We show as Appendices X, XI, XII estimates of expenditure and average cost per unit on the assumptions of a hydro-electric supply at rates of 3·5, 2·8 and 2·5 pies per unit. 3·5 pies can be dismissed at once. It will not pay Delhi under any considerations to take power at this rate. The 2·8 pies rate represents the bare maximum at which on present or immediately anticipated figures the hydro-electric supply would be worthwhile. If, however, the full industrial demand shown in our third stage is taken into question, other considerations enter. For this load the hydro-electric unit rate of 2·8 pies would produce an all-over figure slightly inferior to that we have evolved for the steam station. The 2½ pies rate, on the other hand, would almost certainly be attractive enough to bring in all the Delhi power users and the effect of this, as shown in Appendix XII would be an income to the Punjab of 9·69 lakhs which on such information as we have should more than cover the expenses involved in construction of the line. It is on this aspect, therefore, that we think this problem should be approached.

91. It will be, of course, for the Government of the Punjab to consider whether they approve of an extension at this figure, but we trust that serious and early attention will be given to this matter in that province.

92. We regret not to have been able to make a more positive pronouncement on the possibilities of a development we consider eminently desirable and we strongly recommend that negotiations with the Punjab Government should be continued and every possible endeavour made to bring about a development which holds promise of substantial benefit to both provinces. Our extension proposals in Appendix VIII contemplate fresh plant being put down in 1939 and as it would take two years before a Punjab extension could operate in Delhi a decision one way or the other should be taken this year without fail—and in the event of the link being adopted, given effect to by definite agreements which would enable the Punjab engineers to start work.

Maximum rates to be charged by distributing licensees.

93. We have shown that on our estimates of consumption a central generating authority on the lines we recommend should be able to sell energy in bulk at a rate equivalent to ·4018 anna per unit and it is an essential feature of the scheme we recommend that it should sell to licensees at this rate. In pursuance of our main purpose, *i.e.*, to secure to all Delhi users the lowest possible rates for electric power, it is necessary to consider at what rates the licensees who receive bulk power at a rate equivalent to ·4018 anna per unit could reasonably be expected to retail to the different classes of their consumers. It is a general practice in licences issued to retailers of electric energy to prescribe maxima to the licensee's charges and such maxima exist in the licences at present in force in Delhi. It has too frequently, however, been the practice to regard these maxima as the ordinary citizen regards his roof, *i.e.*, as something situated in the upper regions with which he never expects to come into serious contact. In other words when maxima laid down solemnly in a licence are far above normal rates, it is clear that they are rhetorical rather than real and in the succeeding discussion we shall propose a new level for these maxima deliberately calculated from circumstances of demand, cost and probable returns. It seems to us that the maxima so calculated are much more likely to operate as an incentive to licensees to be constantly on the look-out for means of reducing their own costs than purely theoretical figures set out in the licence to comply with the letter of the law and never considered again.

New Delhi.

94. Our estimate of the total number of units that will be used in New Delhi area in 1940 is 18,267,118. Our proposals, however, contemplate the irrigation, sewage and filtered water pumping installations being supplied direct from the central generating station. These will consume 13,067,118 units and thus the balance for distribution by the New Delhi Municipal Committee becomes 5,200,000. We give below an estimate of the cost to the Committee in buying and distributing energy in bulk from the central generating station:—

(*A*) *Direct Charges*—		Rs.	Rs.
(1) Cost of purchasing 5,980,000 units from Central Authority at ·404 per unit			1,50,247
(2) Maintenance of distribution system other than E. H. T. taken over by Central Power Authority :			
Running substations		6,500	
Maintenance of portion of distribution system not taken over by Central Authority		2,750	
Maintenance of sub-mains in residential buildings		475	
Maintenance of meters		1,660	
Special repairs to cables		3,600	
		14,985	
	Say		15,000
(3) Management Expenses—			
Share of cost of the general administrative organisation of Committee debitable to electrical undertaking		..	42,053
(4) Staff—			
Half the Electrical Engineer's salary		9,085	
Half the cost of Electrical Engineer's office		9,350	
Assistant Electrical Engineer		3,925	
Share of cost of supervision and staff employed on mains, I and II Circles		50,840	
			73,200
Total Direct Charges			**2,80,500**

(B) *Indirect Charges*—		Rs.
Interest at 5 per cent. on capital cost of the assets remaining with the Committee extimated at Rs. 50,91,194 *minus* Rs. 20,58,295 *i.e.* Rs. 30,32,899		1,51,645
Depreciation—		
Substation buildings Rs. 4,27,400 at 1 per cent.	4,274	
Substation plant Rs. 7,25,156 at 5 per cent.	36,258	
Meters Rs. 54,649 at 10 per cent.	5,465	
Distribution Mains Rs. 18,25,694 at 3-1/3 per cent.	60,856	
		1,06,853
Total Indirect Charges		2,58,498
	Say	2,58,500
Cost including Direct and Indirect Charges—		
Direct Charges	2,80,500	
Indirect Charges	2,58,000	
	5,39,000	

95. In the light of these calculations we consider that the following maxima should be applied to the retail prices for energy in the New Delhi area:—

(*a*) For lights and fans	As. 3 net per unit.
(*b*) For all purposes other than lights and fans	An average rate not exceeding one anna per unit.
(*c*) Hire charge for meters	As. 6 per mensem.

Or sale of 5,200,000 units, the receipts will therefore be:—

	Rs.
2,200,000 units at 3 as. per unit	4,12,500
3,000,000 units at 1 a. per unit	1,87,500
	6,00,000
Hire charge for meters at 6 as. per meter	15,216
Total Revenue	6,15,216

On these figures a net surplus revenue of Rs. 76,216 may be expected.

The Committee may find it necessary to extend the distribution system and part of the surplus may be required to meet the additional charges for capital, etc., but we do not anticipate any substantial volume of additional capital expenditure.

Company.

96. The Company, as has been indicated already, presents rather a different problem from the New Delhi Municipal Committee, but essentially the general conditions set out in paragraph 83 apply and the same ultimate purpose is, of course, to be pursued. We asked the Company's representatives at what rates the Company would expect to be able to retail to consumers if it received the supply in bulk at ·4 anna per unit. The Company's answer was in the form of the following statement:—

> "As requested by the Committee we have considered the maximum rates which we could name on the assumption that a scheme can be evolved under which we will receive a bulk supply at ·4 anna per unit.

We have arrived at these maximum rates which we now put forward by basing ourselves on an estimate of what the Company's sales of current are likely to be in 1940, and they are:

1. Lighting and fans—all the year round instead of seasonal rates .	3¼ as. per unit less 10 per cent. for payment within 10 days.
2. Domestic power purposes including cooking, water heating, radiators and refrigerators (wiring to be according to Company's specification)	1·75 as. per unit. Discount as above.
3. Industrial power up to 20 K. V. A.	1·0 anna per unit. Discount as above.
4. Industrial power over 20 K. V. A.	·75 anna per unit. Discount as above.

Subject to a minimum monthly payment (to be agreed later).

While we have given these rates as maxima we have every hope that they may be capable of improvement if and when a scheme acceptable to all parties is agreed on, and is in operation."

97. The Company stressed the fact that the rates they quoted were maxima and we think their caution in avoiding what might seem to them an undue lowering of the 'roof' understandable from a body in their position. The determination of real maxima as distinct from rhetorical figures is a matter of some delicacy and importance and we have been at pains to avoid recommending figures which could be attacked as unreasonable. Our estimates and calculations, however, lead to maximum rates in the Company's area lower than those suggested by the Company in the above statement, and in our view a supply could be made available to consumers in the Company's area, presuming a bulk purchase of energy by it at ·402 anna, at the following rates:—

Domestic Supply; lights and fans . .	Net rate of 2·75 as. per unit.
For all purposes other than lights and fans and public lighting	An average rate not exceeding ·75 as. per unit.
Public Lighting	Net rate net exceeding 1·5 as. per unit or inclusvie of repairs and renewals, 2 as. per unit.

The calculations below illustrate how we have arrived at these figures and their effect on the Company's financial position.

	Rs.
Working Costs—	
1. Cost of purchasing 16,077,000 units at ·402 as. per unit . .	4,03,935
2. Cost of maintaining existing power station as standby . .	62,802
3. Distribution	1,85,813
4. Public Lamps	35,000
5. Rents, Rates and Taxes	3,667
6. Management expenses	1,35,000
7. Law expenses	1,867
8. Miscellaneous charges	60,000
Cost inclusive of distribution	**8,88,084**

98. We estimate the revenue of the Company at the rates suggested in paragraph 97 of our report as follows:—

	Rs.
Sale of 6,000,000 units at 2·75 as. per unit for domestic purposes lights and fans	10,31,250
Sale of 6,000,000 units at an average rate of ·75 as. per unit for purposes other than lights and fans and public lighting	2,81,250
Sale of 1,000,000 units for public lighting at 2 as. per unit inclusive of maintenance and renewals	1,25,000
Sale of 980,000 units for traction purposes at ·75 as. per unit	45,938
Rental of meters and apparatus in consumers' premises	60,000
Miscellaneous receipts	5,000
Gross Revenue	15,48,438

99. In addition to revenue from the sale of energy, meter rent, etc., revenue will be obtained from the interest accruing on monies invested outside the undertaking. In 1935 the interest earned on these investments amounted to Rs. 31,747, and was adjusted in the accounts of the undertaking by credit to the Reserve Fund account. In this statement we have treated this item of revenue as part of the annual appropriation to the Reserve Fund account.

100. The working expenses as estimated amount to Rs. 8,88,084 leaving a gross surplus of Rs. 6,60,354. From this sum appropriations have to be made to the Depreciation and Reserve Funds and in our view Rs. 90,000 and Rs. 60,000 respectively will be ample.

Explanatory notes illustrating these items will be found as appendix XIII.

101. The above calculations show the financial position of the Company when consumption reaches the figures we have estimated for 1940 on the basis of the above rates. After meeting all working costs and appropriations on account of depreciation and reserve funds, a net surplus of Rs. 5,10,000 remains for distribution to shareholders, service of additional capital that may be required for extensions of the Company's distribution system or in any other way which the Company may consider suitable. If developments take the line that we anticipate, the Company should in our view be in a position further to scale down their charges for supply to all consumers in their area, and in the absence of unforeseen circumstances, we consider that within five years a further reduction of 25 per cent. at least should be possible.

102. It was suggested to us by the Factory-owners' Federation that the figure of 6 per cent. return on capital advocated by the recent special tariff board on the cotton textile industry pointed to a 4 or 4½ per cent. limit as being reasonable in the profits of a company distributing electric energy. We have not thought it necessary or advisable or even strictly within our terms of reference to propose any specific limitation on the dividend which an independent company may choose to declare. What we have done is in the light of our estimates of demand, expenditure and returns, to arrive at maximum rates which would leave a reasonable margin for distribution by the Company as its directors might see fit. We advocate the prescription of these maxima as an adequate expression of Government's intervention.

103. On the 4th January 1937 the Company announced the following alteration in its charges commencing with supplies of energy for the month of January 1937.

Domestic Supply.

Lighting and fans all the year round .	3·5 annas per unit less 10 per cent. discount for payment within 7 days.

Domestic power.

Including cooking, water heating, radiators, and refrigerators.	1·75 annas per unit less 10 per cent. discount for payment within 7 days.

Following the lead of the Company the New Delhi Municipal Committee have recommended the reduction of their domestic rates to the reduced levels introduced by the Company from January 1937. These resolutions, however, have been referred for consideration to the Government in view of the peculiar financial position of the New Delhi Municipal Committee and the fact that it has hitherto under Government instructions been looking on its electricity undertaking as a definite source of substantial profit.

Particular points affecting Company.

104. The agreement entered into between the Company and the Delhi Joint Water Board on the 7th February 1936 continues in force until the 1st day of April 1945 and thereafter until the expiration of 24 months notice of termination which either party is entitled to give on the 1st April 1943 or at any time thereafter. This agreement binds the Joint Water Board to take its requirements from the Company up to April 1945. We consider that it should be possible to reach some mutual arrangement with the Company under which the Company will agree to determine the agreement when the Central power authority is in a position to undertake direct supply of energy to the Water Board. At present the charge for energy levied by the Company is equivalent to ·55 anna per unit subject to a minimum consumption of 1,000,000 B. O. T. units in each calendar year. Under our proposals the Joint Water Board would be entitled to a supply at ·5 anna per unit and a saving of about 10 per cent. in energy charges would be secured. We think that the Company should forego its rights under the agreement in order to facilitate the setting up of a Central Generating Authority on the lines we have indicated, but except for the possibility of making a small saving for the Water Board the matter is not of paramount importance if the Company agrees to take all its supplies in bulk from the Central Authority.

105. In its proposals the Company remarked that an extension of the tenure of its licence would be a necessary concomitant of its association with a centralised generation scheme, and in evidence before us this view has been emphasised. The option of purchase given by Section 7 of the Indian Electricity Act, 1903 under which the Company's licence was granted is first exercisable on the 1st day of March 1947 and we have not thought it necessary to make any recommendation on this point; its determination is a matter for the future and is not essential to the adoption of our present proposals.

106. In view of our conviction that it is essential to concentrate generation if real economy is to be secured, it will however, be clear that the Company's participation in the scheme we recommend is of the utmost importance. The Company, we believe, attaches great importance to the

conclusion of some arrangement with the New Delhi Municipal Committee under which an adequate bulk supply of energy will be made available to it between now and the time when the central generating station comes into operation. We consider this attitude not unreasonable and in fact regard a satisfactory solution of the supply position in the Company's area during this intervening period as a matter of the first importance. We recommend therefore that the demand for energy which the Company is likely to make on the New Delhi generating station in the intervening period should be met and are satisfied that it can be met. We advise that the New Delhi Municipal Committee should undertake to guarantee the Company's bulk supply of energy for a period of, say, two years or until the central generating authority comes into being. We understand that there have been recent negotiations between the Company and the Committee in regard to the rates at which such a supply should be given and that the following rate has been under consideration*:

A standing charge of Rs. 75 per KW M. D. up to 600 KW
" " 25 " above 600 KW
plus
·8 a. per unit for the first 2 million units of annual consumption.
·4 a. per unit for all additional units consumed.

We consider that these rates might reasonably be accepted for the period proposed.

Particular points affecting New Delhi Municipal Committee.

107. The electrical undertaking of the New Delhi Municipal Committee was transferred from Government and the value put on it for purposes of the transfer together with the value of certain other works also handed over, was Rs. 60 lakhs. This sum was treated as a loan, bearing interest at 5 per cent., the principal to be repaid to Government in 30 half-yearly equated instalments of Rs. 1,72,608, inclusive of interest. In addition to making annual payments to Government by way of interest and sinking fund charges the Municipal Committee has also been making annual provision for depreciation and the depreciation fund had accumulated by the end of 1935-36 to Rs. 5,39,580. We understand that the intention was to utilise all or part of this for the purchase of plant to increase the output of the station, a proceeding with which we are not in agreement as not in accord with the general principles governing the utilisation of depreciation funds.

108. In our opinion a responsibility for sinking fund charges in addition to adequate provision for depreciation represents an undue burden on the electrical undertaking and, as we see the position, it is not necessary to have provision for both; one or the other should be foregone. We consider the basis on which the Municipal Committee is now providing for depreciation to be reasonable and subject to any adjustments that may be required when the true replacement costs of the various items and assets have been ascertained we advise that Government should ease the burden on the undertaking by foregoing that part of the annual debit which relates to repayment of the principal of the loan.

109. In our estimates relating to the capital and recurring expenditure on the central generating station we have assumed that the capital required to finance the new undertaking will be forthcoming at 3¼ per cent.

*We understand that these rates have been accepted.

and that Government will not insist on a sinking fund to amortise the principal provided they are satisfied that adequate annual depreciation provision will be made.

110. It was urged before us by the representatives of the New Delhi Municipal Committee that as its sources of revenue were limited, as a result of the peculiar conditions of the new capital, it ought to be enabled to make as much profit as possible out of "municipal trading in a general utility". Since our proposals involve a considerable diversion of the revenue at present obtained by the New Delhi Municipal Committee from its electrical undertaking, they will no doubt meet with strong opposition from that body. So far as we can see the Committee from the sale of electric energy is obtaining a considerable part of the finance required for its general municipal activities.

We observe from the accounts of the New Delhi Municipal Committee for 1935-36 that since in addition to a net profit of Rs. 2·89 lakhs the accounts cover an interest payment of Rs. 2·54 lakhs, the electrical undertaking is in effect being run at a profit of over 10 per cent.

It is in our view correct that the circumstances of New Delhi probably limit the scope of ordinary municipal revenue, and Government is a contributor to these anomalies by, *e.g.*, removing annually for several months a large portion of the municipality's population. The New Delhi Municipal Committee's desire to make as much profit as possible from this easy source in understandable enough but we venture to suggest that it is short-sighted and the problems of municipal administration and efficiency are better approached from a different aspect. A municipality should charge its ratepayers for the various services it renders them at rates which will cover the cost of rendering these services *plus* a reasonable margin. If too much reliance is placed on one source of revenue the tendencies are that other sources will either be insufficiently developed or not developed at all. For example, a conservancy rate is a common levy in modern municipalities but so far as we are aware, New Delhi Municipal Committee which might well make such a levy has not so far done so; and finally, if it is desired to take revenue from users of electric energy we suggest that this would be better done directly than masked in the shape of excessive rates. One possible method would be to apply an Electricity Tax to the power taken by the distributing licensees and leave them to recover this from the consumers.

111. One point we should like to stress is that if the rates for electric energy which we recommend are put into force, substantial savings will accrue to certain departments of the Central Government. On the figures of expenditure in 1935-36 we estimate these savings as follows:—

Estimated annual saving.		Rs.
Energy for lights and fans in works and offices		7,372
Do.	other purposes in do.	17,325
Do.	New Cantonments.	23,154
Do.	lights and fans in Government Press	1,323
Do.	other purposes in do.	11,255
Do.	lights and fans in Central Buildings	12,859
Do.	other purposes in do.	16,261
Do.	lights and fans in Viceroy's House	8,787
Do.	other purposes in do.	11,290
Do.	road lighting in do.	2,834
	TOTAL	1,12,460

To this figure, already substantial, must be added the equally substantial saving which will accrue to the Central Government in the shape of reduced cost of the energy supplied to the irrigation pumping station. The net cost of this in 1935-36 was Rs. 2,28,652. We propose that energy could be available for irrigation purposes from the central generating station at a rate equivalent to ·5 anna per unit as against the present 1·4 annas *less* 10 per cent. The consequent saving will amount to Rs. 1,38,000 per annum.

Thus our proposal will mean to the Central Government a saving of Rs. 2·50 lakhs. There will also be a small saving in the cost of filtered water supply but we have not taken this into account or pursued calculations in its regard. The general dimensions are as established above.

112. We suggest that the whole or part of this saving could be returned to the New Delhi Municipal Committee in the form of a grant-in-aid. As we have indicated above, we think it desirable that a local body's financial position should be stripped bare under each of its various aspects and not carry concealed subsidies under any.

Particular points affecting the Central Generating Authority.

113. In paragraph 14 we explained that their exists in the Licence granted to Messrs. Martin & Co. for supply of energy in the Shahdara area a provision for the licensees taking a bulk supply of energy from a source other than the United Provinces Grid System. This provision becomes operative from December 1937. In our estimate of capital expenditure we have provided for a transmission line from the central generating station to Shahdara and we recommend that the central Authority should, as soon as possible after it is constituted, enter into negotiations with Messrs. Martin & Co., with a view to supplying energy in bulk from the central generating station. The agreement entered into with the licensees should contain provisions prescribing the maximum rates at which energy will be sold to the different classes of consumers. In our view it should be possible for the licensees to retail energy at lower charges than at present if a bulk supply is obtained from the central generating station.

114. Our scheme contemplates energy being supplied direct from the central generating station to licensees and to consumers whose demand exceeds a certain figure, and that energy be made available to other licensees at rates equivalent to the bare cost of production at point of users' demand *plus* appropriate allowance for interest, depreciation, and renewals reserve. We now come to rate or rates at which supply should be made to the large users mentioned above. In Appendix IX we have exhibited estimates of the selling price per unit at each stage of development. These vary from ·5566 to ·3410 annas per unit in the first and third stages respectively. The first stage of development is based on the combined figures on recent consumption in Old and New Delhi, and as we remarked already, is really starting point. Consumption of energy has in the past shown a steady annual increase and quite apart from any special development resulting from the proposals of general rationalisation we advocate, this increase in consumption may confidently be expected to continue. By the time the central generating station comes into operation this increase will have been such that the rate at which energy can be sold can safely be taken between ·5 and ·4 anna per unit. We recommend that, in the first instance, the maximum rate at which energy should be sold to users of power above 500,000 units per annum should be equivalent to ·5 anna per unit.

We may mention here that the Delhi Sewage Disposal Enquiry Committee in their estimates of recurring expenditure likely to be incurred on the scheme proposed by it assumed that energy would be available at ·5 anna per unit and recommended that all the equipment should be electrically driven. Our rate equivalent to ·5 anna per unit has therefore been confirmed by independent examination.

A large user who agrees to take power from the central Authority may not be able to or may not wish to dispose of his own plant or may have to keep it for internal purposes, *e.g.*, production of steam. Such a consumer might have in his own plant an adequate standby for his own consumption and might offer to absolve the central Authority from the obligation to supply him in the event of a breakdown in its own system. This would amount to such a consumer sharing the risk with the authority and would we think, be a reasonable ground for some degree of concession in rates. The actual expression of this concession would, however, be a matter for agreement between the authority itself and the consumer.

115. A two-part tariff based on maximum demand has been suggested to us as a method of payment which would commend itself to many power users and we have worked out such a tariff for each development stage with the results shown in Appendix XIV. As we have indicated already there are unknown or conjectural elements affecting power consumers' demand, particularly the load factor and the maximum demand likely to be made. Consequently it is necessary to provide a margin of safety and we recommend for the first two years the two-part tariff for power users should be Rs. 4-4-0 per KW of maximum demand per month *plus* a charge per unit consumed of ·26 anna. Those concerned will, of course, have the alternative of taking their supply at a fixed rate of ·5 anna per unit and any agreement between the central authority and large power consumers should contain explicit provision that the total payment under the two-part tariff will not exceed the total that would be leviable at the flat rate of ·5 anna.

It is possible that the demand on the central generating station will grow more rapidly than we have anticipated and that the results of the first year's operations may show that some reduction in the rates we have proposed can safely be made. We have no doubt the central Authority will review the position at the end of the first year's operations and make such modifications in the rates as circumstances may require.

We have suggested a two-part tariff and as an alternative a flat rate of ·5 anna per unit for large power consumers. We appreciate that in certain cases neither of these rates may be considered sufficiently attractive to bring into the scheme some of the large industrial power users. We do not wish it to be understood that we desire to fetter the discretion of the central Authority in the matter of its rates policy. If the authority finds that special rates can be given to particular classes of supply with a view to improvement of load factor or for any other consideration we think it should be completely free to adopt such measures and rates as may be suitable in the circumstances of the case.

116. The inclusion in supply agreements of a condition permitting the variation of rates according to variation in the cost of coal is a common feature and the discussions in paragraph 77 of this report will have shown the necessity for such a condition in the agreements now under discussion; these, therefore, should all provide for rate variation according to variation in the cost of coal delivered at the central generating station.

117. A portion of the power taken by large users is required for other purposes, such as lighting factory premises. It conduces to simplification and smoothness of working if the large user is allowed to take his power in bulk and thereafter employ it for subsidiary purposes within his factory subject to a reasonable limit on this concession. We recommend, therefore, that licences to be granted to the authority and all agreements concluded between it and large users should provide for the energy supplied to the latter being used for lighting factory premises or for fans, road lighting or employees' quarters provided that the energy taken for this purpose does not exceed in any year 15 per cent. of the total amount supplied.

118. We recommend that, as a general rule, the energy supplied to large power users should be of the same quality and at the same pressure as that supplied to the other licensees, namely, three-phase fifty-cycle alternating current at 6000/6300 volts at the consumer's point of supply, all transformation to suit the consumer's purposes being undertaken by the consumer. Circumstances may, however, arise making it inconvenient for the consumer to take a supply at high pressure alternating current, and we recommend that the licence to be granted to the Authority should cover other possible systems of supply.

119. In order to maintain a satisfactory power factor within the system the central generating authority may find it necessary to lay down certain conditions specifying the minimum power factor of consumer's installations. It will no doubt be found to be desirable, by means of small rebates or penalties, to provide the necessary incentive to the distributing licensees and large power users to co-operate with the authority in the matter of power factor improvement and control. The principles on which these rebates and penalties are fixed, are well-understood, and beyond mentioning the matter we do not consider it is necessary to make any specific recommendation.

120. It is necessary to define the expression "maximum demand" in reference to supplies to large power users and others who elect the two-part tariff. We recommend a clause on the following lines to be included in the agreements:

"The maximum demand at each point of supply to the licensee or consumer of industrial power in each month shall be the largest total amount of KW delivered to the feeders of the licensee or power consumer, as the case may be, at the point of supply during any consecutive thirty minutes in the month".

121. We have given as Appendix XV a form of licence which might be adopted for issue to the Authority we recommend and which will in any case offer, we hope, a useful model from Government's consideration. Its final form will of course, be subject to modification in detail, particularly if Punjab hydro-electric power is taken.

Miscellaneous minor topics.

122. A variety of minor topics was brought to our notice either in correspondence or during our hearing of the evidence laid before us. We shall deal with these briefly in the following paragraphs:—

123. The presence of both alternating and continuous current systems in the Old and New Delhi areas has led to certain amount of inconvenience to the owners of radio receiving sets. A large portion of the population of

New Delhi moves annually to Simla and naturally takes its receiving sets with it. In Simla the alternating current system has been adopted with the consequence that radio sets suitable for Simla conditions cannot be used in the continuous current areas of Delhi unless through the means of an expensive converting equipment. The existence of such inconvenience is undoubted but we cannot feel that it would be an adequate justification for the abandonment of the continuous current system where it applies now. There are radio receiving sets now in the market which can be used either on continuous or alternating current circuits and we have no doubt that radio manufacturers will develop still further the production of satisfactory receiving sets which can be used with either system of supply. We have therefore no recommendation to make on this point. In connection with such domestic appliances as fans, etc., which it was pointed out cannot be transferred from an A.C. to a D.C. area or *vice versa* a certain degree of inconvenience is inevitable if both the systems are present in a comparatively small area, but we do not see how this is really to be avoided and as above remarked we do not think that it would justify the confining of installation to one system.

124. The Company has been in the habit in the past of demanding security from domestic consumers under the provisions of the Indian Electricity Act of 1910 [Schedule clause VI (1)] and it was suggested to us that the amounts demanded were excessive and acted as a deterrent to small potential consumers. The security demanded hitherto is Rs. 25 on which, however, the Company pays interest at 6 per cent. per annum. We are informed moreover that in many cases they refund the deposit if the consumer has been taking energy for some time and has shown himself to be a satisfactory customer. The Company assure us that while they recognise that a variety of small charges is apt to cause disproportionate friction, a charge of this kind is a very common element in electric supply undertakings in any country and that while they deplore the necessity, they do not feel the safeguard represented by this deposit against undesirable connections can be given up. We think this reluctance not unjustified, particularly in the case of an undertaking like the Company serving a very large number of small consumers. We think, however, that there is some scope for reducing the amount of security demanded from domestic consumers and recommend that a graded scale of deposits based on the size of the consumer's installation should replace the present fixed charge. The scale we suggest is as follows:—

Domestic Supply.

Load in watts.	Deposit.
	Rs.
Under 250	10
500	12
750	14
1,000	16
2,000	20
3,000	25
4,000	30
5,000	35

For every additional 100 watts Rs. 5.

125. Another minor charge which appears to have produced a disproportionate amount of resentment and criticism is that for meters installed by the Company in consumers' premises to indicate the amount of energy

supplied or the electrical quantity contained in the supply. When we examined the Company's representatives, its charges for hire of consumers' meters were -/12/- per month for continuous, and -/8/- for alternating current meters up to 10 ampere rating. The Company of its own volition decided with effect from January, 1937 to reduce to 6 annas per month the hire charge for all classes of meters up to 10 ampere rating. We welcome this reduction and consider that the hire charges now in force are reasonable.

126. After the Company's publication of its lowered rates, the New Delhi Municipal Committee took up the question of bringing its own charges into line and we understand has recommended to Government that meter hire charges in New Delhi be brought to the Company's figure, *i.e.*, 6 annas per month per meter up to 10 ampere rating.

127. A by-product of the peculiar development of electric supply in Delhi described briefly in paragraph 28 was the persistence in a certain limited areas of Delhi of differential—and generally higher—domestic rates. Briefly the position was that when the bulk supply agreement between the Company and the Government (subsequently inherited by the New Delhi Municipal Committee) was entered into in 1928, a schedule was added specifying the rates which should be charged for certain Government buildings in north Delhi. At that time the Company's domestic rate was higher than the rate thus scheduled but since then the Company's general rate has been reduced below that schedule figure with the consequence that the occupants of those buildings have for some years past been paying substantially higher charges than the Company's ordinary consumers. We are glad to report that the Company has taken up with the Chief Commissioner the removal of this relic and is prepared to supply these consumers at the ordinary rates obtaining in their area and also, we believe, to refund the difference hitherto charged. We welcome this removal of an anomaly from Delhi electric supply rates.

128. A memorandum was submitted to us on behalf of property owners and residents of Mahrauli, the flourishing village in the neighbourhood of the Kutub Minar, which has been constituted into a Notified Area as will be observed from the map. This memorandum stressed the desirability of extending electric supply to that region. We are definitely of opinion that early steps should be taken to extend the supply of electrical energy to this area and indeed to disperse it more widely over the province and we think that our proposals form the necessary first steps to making such a consummation possible. We suggest that early steps be taken to extend the high tension transmission system to Mahrauli and we have included in our estimate of capital expenditure in Appendix VIII an appropriate amount for this purpose. When this extension has been completed, bulk supply can be given from the central generating station but before this can be made available to Mahrauli residents, some body will have to take out a licence for retail distribution. That body, we suggest, should be the New Delhi Municipal Committee and we recommend that a retail licence be given to it for this purpose. It is in a very favourable position to undertake economically work connected with the distribution of energy in Mahrauli; the southern limit of its present area of supply is less than 3 miles distant at the present time and the fully qualified staff now in its employ should be made available at a very small cost for the provision and operation of the distribution system to Mahrauli.

129. One or two of the representations before us suggested that the alternating current supply was unduly dangerous and should be replaced by the continuous current system. Others suggested that the present continuous system should be replaced by a low voltage (110) alternating current system. This controversy A.C. *versus* D.C. is of long standing and is likely to continue, and we do not think it necessary to contribute further to it. We admit that alternating current is potentially more dangerous than continuous current, and that fatalities due to electric shock are more frequent on A.C. systems, but we are satisfied that A.C. electrical installations and appliances can be constructed and maintained in a way that will ensure complete safety to the users. The dangers attendant on the use of alternating current can be avoided by the use of good quality materials and appliances, the insistence on a high standard of workmanship and technique in the installation work, and proper maintenance. Systems of electric supply, like everything else in the electrical world, are under constant experiment and development, and it would not be desirable to take restrictive measures which might petrify or obstruct the natural course of development as indicated by experience.

130. The Chief Engineer, All-India Radio, brought to our notice that considerable trouble was being experienced owing to voltage fluctuations in the Company's power supply to the Delhi All-India Radio Transmitter. It was stated that, in order to obtain satisfactory life and service from wireless transmitting valves, it was important that voltage fluctuations should not exceed $\pm$ 5 per cent. The nature of the supply to the Delhi Broadcasting Station is three-phase 50 cycles 6600 volts between phases. In the Rules under the Indian Electricity Act, 1910 (rule 26) the permissible voltage variation at this pressure is $\pm$ 12½ per cent., and, as it has been admitted that the fluctuations do not often exceed these limits, the Company are not committing a breach of the Act or Rules. We can only suggest that, in view of the importance of unvarying voltage for wireless transmission, the Company should make special arrangements to ensure closer voltage regulation for this supply.

131. It was suggested to us that the use of electricity for advertisement purposes offered a suitable field in Delhi for the development of electrical demand. We are not altogether convinced that any great demand will be forthcoming from this source, but we have no doubt that the licensees will do their utmost to encourage the use of electricity for this purpose. Specially low rates can be given for advertising signs, and similar appliances. We think a rate of one anna per unit would be suitable, and give the necessary incentive to prospective advertisers.

132. It was represented to us by the Public Works Department that the rates charged for pumping unfiltered water were excessive. The pumping station is close to the generating station and thus the New Delhi Municipal Committee is saved the cost of distribution and transmission losses are inconsiderable. Moreover, the Public Works Department by agreement runs its pumps to suit the convenience of the generating station and in return for this forbearance claims not unreasonably some consideration in rates. They are now charged a rate more than twice that paid when the generating station was run by Government. We consider this complaint not without justification and hope that our general proposals regarding rates presented elsewhere in this report will cover it.

Conclusion.

133. We have for convenience made a summary of our conclusions and recommendations which will be found as Appendix I. It will be for Government to decide on the action to be taken but we do not think it would infringe on their discretion if we were to suggest a certain order of decision as desirable. In our view the concentration of generation is essential, whether the other proposals we make are adopted or not. Even if no other change were made at all, electrical generation in Delhi should be put into a single set of hands, and we recommend that the constitution of a Central Generating Authority be taken up immediately. If our other proposals are adopted it will be all the more necessary to have this authority constituted in advance for it should be to it that the business of arrangements for supply, etc., should fall.

134. A second point for urgent settlement is that we have indicated in paragraph 106. Delhi's position in past years in regard to supply of electrical energy has been adversely affected by the continuance of this uncertainty regarding the supply position as between the New Delhi Municipal Committee and the Company. Whatever the final outcome, this uncertainty should in the interests of the consumers themselves be ended till permanent arrangements are brought into force. With the installation of additional generating equipment at the close of this year the riverside power house will be able to meet with ease any demands upon it by the Company within the next two years, and we recommend that an immediate agreement be brought about to that end.

135. The third point we should like to urge is the immediate and earnest prosecution of the possibility of a Punjab link. We have indicated in paragraph 92 the importance of the time factor in this regard and would like again to emphasize it. This is one of those opportunities which occur but do not recur. Provincial hesitations are not unnatural but are not, we believe, insuperable. What is important is that the mere passage of time should not be allowed to enter as another adverse factor against a possible decision to secure this link. We have recommended that the central authority should be brought into being as soon as possible and would add that till its constitution Government should itself pursue investigations into the possibility of a Punjab connection which, we repeat, would in our opinion be to the great advantage of both the large and the small province concerned.

136. We do not propose to discuss further the other individual recommendations in our report. We have tried to give them an organic form and to present the Delhi position against a general background. Few things function in isolation and electrical energy is a phenomenon which has perhaps less regard for parochial divisions, compartments and attitudes than almost any other feature of our modern world.

We have the honour to be,

SIR,

Your most obedient servants,

J. S. PITKEATHLY (*Chairman*).

SHRI RAM.

W. M. VACY-ASH.

M. W. YEATTS (*Secretary*).

APPENDIX I.

Summary of Conclusions and Recommendations.

(Figures in italics refer to relevant paragraphs.)

1. Present and immediately anticipated equipment of Delhi Province for generation of electric energy inadequate. (*26—28.*)

2. Concentration at one producing centre of all generation of electric energy in Delhi Province essential. (*37, 43, 133.*)

3. Present power station of New Delhi Municipal Committee on river bank the only suitable site. (*26, 63.*)

4. Present generating and high tension distribution plant of New Delhi Municipal Committee be taken over at valuation along with further plant under order. (*65.*)

5. No plant of Company be taken over. (*63.*)

6. Company's present high tension mains between Lahori Gate and riverside power station be taken over at valuation. (*66.*)

7. Further development by stages designed to fit in with anticipated development of demand. (*64-65 and Appendix VII.*)

8. The United Provinces hydro-electric system cannot meet Delhi needs. (*85.*)

9. In the event of hydro-electric power in the Punjab becoming available at a favourable rate, it should be taken. (*86, 90, 92, 135.*)

10. If Punjab link effected, extensions of power station will not be necessary. (*86.*)

11. High tension distribution extensions will, however, be necessary. (*86.*)

12. Management of generation of electric energy by a Joint Board, which would also deal with water and sewage, undesirable. (*46.*)

13. Generation of electric energy should be entrusted to an authority which might be termed the Delhi Central Electric Power Authority, registered under Companies Act on guarantee with no share capital, on lines indicated in Appendices VI-A and VI-B. (*47, 133.*)

14. The New Delhi Municipal Committee should guarantee a bulk supply to the Company for two years or until the central generating Authority comes into being. (*106, 134.*)

15. Existing agreement between the Joint Water Board and the Company (which continues in force until the 1st day of April 1945) should be determined when the central generating Authority is in a position to undertake direct supply. (*104.*)

16. Management of the Authority should be through a Board on which the two Municipalities, the Punjab Chamber of Commerce, licensees, industrial consumers, the Cantonment and Government should be represented (*Appendix VI-B, Section 22.*)

17. Capital to be found by loan by Government. (*Appendix IX, Section 11.*)

18. Authority to be on no-profit basis, its charges covering only working cost, interest and depreciation charges and small renewals reserve. (*43, 114.*)

19. The Authority should enter into negotiations with the Shahdara licensees with a view to supplying this area in bulk from the Central Generating Station. (*113.*)

20. Maximum rates be fixed for charges. (*43, 114, 115 and Appendix XIV.*)

21. Consumers of more than 500,000 units per annum be allowed to take supply direct from generating station. (*38—42.*)

22. The licence issued to the new generating Authority might follow the model suggested in Appendix XV. (*121.*)

23. Maxima be applied to charges made by distributing licensees. (*93—97.*)

24. Early arrangements be made for the extension of high tension distribution to Mahrauli by the New Delhi Municipal Committee. (*128.*)

25. Company's charges under security deposits from consumers be reduced and linked with capacity of installations. (*124.*)

26 Both alternating and continuous current systems of supply be permitted. (*129.*)

27. Cost of so much of New Delhi electrical system as was installed for aesthetic reasons be removed from the accounts of New Delhi electric undertaking and treated as a subsidy to the Municipality. (*29.*)

28. Provision for sinking fund in addition to adequate provision for depreciation by the New Delhi Municipal Committee represents an undue burden on their electrical undertaking. (*108.*)

29. The whole or part of the savings which will accrue to certain Departments of the Central Government as a result of the adoption of the rates recommended could be returned to the New Delhi Municipal Committee in the form of a grant-in-aid. (*111-112.*)

30. Meter rents be equalised and lowered. (*125-126.*)

APPENDIX II.

List of representations received

Local Bodies, etc.—

Delhi Municipal Committee.
New Delhi Municipal Committee.
Delhi Joint Water Board.
Superintending Engineer, Health Services, Delhi.
Superintending Engineer, 1st Circle, Central P. W. D.

Licensees—

Delhi Electric Supply and Traction Company, Limited.
(*see also New Delhi Municipal Committee.*).

Commercial and Private Bodies—

Delhi Cloth and General Mills Company, Limited.
Delhi Factory Owners' Federation.
Glassware Merchants' Association.
Gwalior Potteries, Limited.
Imperial Secretariat Association.
Punjab Chamber of Commerce.

Individual Consumers—

Mr. Bangali Mal,
Chief Engineer, All-India Radio.
Mr. G. T. Tait—Timarpur.
Haji Mohammad Saleh.
Mahrauli Residents.
Mr. Mulchand Sharma.
Timarpur Residents.

APPENDIX III.

List of witnesses examined.

Local Bodies.	*Represented by*
Delhi Municipal Committee . . .	1. Mr. Harish Chandra, Advocate (Senior Vice-President). 2. K. S. Haji Rasheed Ahmad. 3. Mr. Raj Narain Khanna. 4. R. B. Sohan Lal, M.B.E., P.C.S. (Retired) Secretary. 5. Mr. S. N. Chakravarti, I.S.E., Municipal Engineer. 6. Prof. B. C. Chatterjee, M.I.E.E., F.R.S.A.
New Delhi Municipal Committee . .	1. Mr. A. W. H. Dean, M.C. (President). 2. S. B. Sobha Singh (Vice-President). 3. R. B. M. R. Soi, Electrical Engineer. 4. R. B. Joseph E. Thakar Das, P.C.S. (Secretary). 5. Mr. Rang Behari Lal (Financial Member).
Delhi Joint Water Board & Superintending Engineer, Health Services, Delhi.	Mr. J. A. R. Bromage, M. Inst. C.E.
Licensees.	
Delhi Electric Supply and Traction Company, Ltd.	1. Mr. A. W. R. Lovering (Director and Secretary). 2. Mr. S. H. Taylor (Director). 3. Mr. H. J. Donkin (General Manager).
(See also New Delhi Municipal Committee.)	
Commercial Bodies.	
Crown Flour Mills, Delhi . . .	Lala Baij Nath Syal.
Delhi Cloth and General Mills Co., Ltd. .	1. Lala Shankar Lal. 2. Mr. Ram Narain Khosla.
Delhi Factory Owner's Federation . .	Lala Baij Nath Syal.
Glassware Merchants Association . .	Mr. Noor Ahmad.
Gwalior Potteries, Ltd.	Mr. R. K. Saksena.
Punjab Chamber of Commerce . .	Mr. Raj Bans Bahadur.
Individual consumers.	
	Mr. Bangali Mal. Mr. R. E. Grant Govan. Haji Mohammad Saleh.
Individual officers.	
	J. C. Nixon, Esquire, C.S.I., C.I.E., I.C.S. F. T. Jones, Esquire, C.I.E., M.V.O. A. P. Hume, Esquire, I.C.S. H. P. Thomas, Esquire, C.I.E., Chief Engineer, Punjab, P. W. D., Electricity Branch.

APPENDIX IV.

DELHI ELECTRIC SUPPLY AND TRACTION COMPANY, LIMITED.

(INCORPORATED IN ENGLAND.)

Statement showing the rate of Dividend paid to Shareholders from 1908—1935.

Year.	Perferred shares.	Ordinary Shares.	Remarks.
1908	..	..	
1909	..	..	
1910	..	..	
1911	..	..	
1912	..	..	
1913	..	..	
1914	..	..	
1915	..	..	
1916	2%	..	
1917	4%	..	
1918	6%	..	
1919	7%	6¼%	
1920	8%	7½%	
1921	8%	7½%	
1922	8%	7½%	
1923	10%	9½%	
1924	10%	9½%	
1925	12%	11%	
1926	12%	11%	
1927	..	12%	All Preferred Shares converted to Ordinary Shares.
1928	..	12%	
1929	..	12%	
1930	..	12%	
1931	..	12%	
1932	..	12%	Free of Income Tax.
1933	..	12%	Do.
1934	..	12%	Do.
1935	..	12%	Do.

APPENDIX V.

DELHI ELECTRIC SUPPLY & TRACTION COMPANY, LIMITED, DELHI.

Form of Accounts. 31st December 1935.

As prescribed for Companies under the Indian Electricity Act, 1910.

Statement of Share Capital appropriated for the purposes of the undertaking authorised by the Electric licence at the end of the year.

No. I.

Description of Capital.	Authorised by	No. of shares issued.	Nominal amount of share.	Called up per share.	Total paid-up.	Issued not paid-up.	Remaining unissued.	Total amount authorised
		£	£	£	£	£	£	£
Ordinary	Prospectus and articles of association.	200,000	1	1	200,000	*Nil.*	*Nil.*	200,000

Statement of Loan Capital appropriated for the purposes of the undertaking authorised by the Electric licence at the end of the year.

No. II.

Description of loan.	Amounts borrowed.				Remaining borrowing powers.	Total amount of borrowing powers
	At per cent.	At per cent.	At per cent.	Total.		
	£	£	£	£	£	£

Total Share Capital Paid-up, see No. I.
Total Loan Capital Borrowed, see No. II.
Total Capital Received.

Companies' Accounts.

No. III.—CAPITAL ACCOUNT.

Dr.	Expenditure up to end of previous year.	Expended during the year.	Total Expenditure to	Cr.	Received up to end of previous year.	Received during the year.	Total receipts to
	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.
1. To preliminary expenses (to be specified)	..	..	..	By ordinary shares of	200,000 0 0	..	200,000 0 0
Cost of orders and original Installation	..	..	..	Ditto	..	..	..
				By preference shares of.	..	..	..
				By Debenture stock	..	..	..
2. To land including law charges incidental to acquisition	..	5,389 4 11	5,389 4 11	By mortgages and bonds.	..	..	..
3. To buildings	19,506 10 7	505 3 1	20,011 13 8	By amounts received in anticipation of call.	..	..	..
4. To plant	144,518 6 7	3,629 6 5	148,147 13 0	By other receipts (to be specified).	..	..	..
5. To mains (underground)	18,778 14 6	220 15 9	18,999 10 3				
6. To service connections	68,170 4 4	6,603 13 9	74,773 18 1				
7. To transformers, etc.	..	..	..				

8. To meters, and fees for certifying under the Act .	..			..			.					
9. To general stores.	..			..			..					
10. To special items (to be specified).	..			..			..					
Tramways (including Rollingstock)	62,113	15	0	..			62,113	15	0			
Petrol Buses .	4,194	10	1	..			4,194	10	1			
Trolley Buses .	4,691	11	0	27	19	2	4,719	10	2			
Overhaul Equipment unclassified items (original contract) .	5,472	18	6	723	7	10	6,196	6	4			
Unclassified items (original contract) . .	19,631	7	8	..			19,631	7	8			
Poles and Brackets	10,009	4	1	..			10,009	4	1			
Total expenditure.	357,087	2	4	17,099	10	11	374,186	13	3	200,000	0 0	.. 200,000 0 0
To balance of Capital Account . .	357,087	2	4	17,099	10	11	374,186	13	3	200,000	0 0	20,000 0 0

No. IV.—REVENUE ACCOUNT.

Dr. Cr.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
A.—Generatin.					
1. To fuel	17,541 6 7		1. By sale of energy for lighting purposes.	52,412 4 5	
2. To oil, waste, water and engine-room stores	2,634 7 10		2. By sale of energy for power purposes	29,559 0 11	
3. To proportion of salaries of engineers, superintendents and officers	2,662 12 8		3. By sale of energy under special contracts	12,249 5 10	
4. To wages and gratuities	832 17 6		4. By public lighting	12,034 9 10	
5. To repairs and maintenance as follows:—			5. By rental of meters and other apparatus on consumer's premises	7,329 17 5	
Buildings	54 10 9		6. By rents receivable	112 6 9	
Plant	2,207 14 6		7. By transfer fees	..	
To special items (to be specified).			8. By miscellaneous receipts from consumers	457 14 2	
Current purchased from New Delhi Municipality	7,991 11 11				114,154 19 4
Tools	159 3 0		9. By other items (to be specified)	..	
		34,084 4 9	Profit on Tramways	..	244 19 8
					1,14,999 19 0
B.—Distribution.					
1. To proportion of salaries of engineers, superintendents and officers	1,638 0 0				
2. To wages and gratuities	1,931 14 9				
3. To repairs, maintenance and renewals of mains	5,995 8 6				
4. To repairs, maintenance and renewals of transformers, etc.	..				

5. To repairs, maintenance and renewals of meters, switches, cut-outs and other apparatus on consumer's premises	2,788	0 4	
Maintenance of tools	159	5 1	
Miscellaneous	298	18 7	
			12,811 5 3
C.—*Public Lamps.*			
1. To attendance and repairs	2,334	10 1	2,334 10 1
2. To renewals, etc.	..		..
D.—*Rents, rates and taxes.*			
1. To rents payable	253	3 6	
2. To rents and taxes	22	3 4	
			275 6 10
E.—Management expenses.			
1. To Directors' Technical advisers remuneration	2,450	0 0	
2. To management	5,833	13 3	
3. To general establishment charges	1,424	7 4	
4. To auditors of Company	255	0 0	
5. To Auditor appointed under the provisions of the Act	..		9,963 0 7
F.—*Law charges.*			
To law expenses	..		139 11 7
			59,607 19 1

1,14,399 19 0

No. IV.—REVENUE ACCOUNT—*contd.*

Dr.	£ s. d.	£ s. d.	Cr.	£ s. d.	£ s. d.
		59,607 19 1			114,399 19 0
G.—Depreciation.					
1. To depreciation in respect of leasehold works 2. To depreciation in respect of buildings 3. To depreciation on plant 4. To depreciation on mains 5. To depreciation on transformers, etc. 6. To depreciation on meters 7. To depreciation on general stores. 8. To depreciation in respect of any other items, to be specified		7,000 0 0			
H.—Special charges.					
To special items (to be specified)	..				
Fire and other Insurance	483 0 8				
Miscellaneous	4,039 3 8				
		4,522 4 4			
Total expenditure		71,130 3 5			
Loss on Petrol Buses 1,316 9 1	..	1,843 9 8			
Loss on Trolley Buses 527 0 7	..				
Balance carried to net revenue	..	41,426 5 11			
		114,399 19 0			114,399 19 0

No. V.—NET REVENUE ACCOUNT.

Dr.	£	s.	d.		£	s.	d.	Cr. £	s.	d.
1. To interest on debentures accrued due to date	..			1. By Balance from last account	..			40,031	1	8
2. To interest on mortgages and bonds accrued due to date	..			*Less* dividend paid	24,000	0	0			
3. To interest paid less received	34	12	2	By amount carried to Reserve Fund	4,618	19	5	28,618	19	5
								11,412	2	3
4. To dividend on preference stock	..			2. By Balance brought from revenue account (No. IV)	..			41,426	5	11
5. To income-tax	10,000	0	0	3. By interest on money at deposit.	..			..		
6. To balance applicable to dividend on ordinary stock or shares	43,111	5	6	Transfer fees				19	6	0
				Provident Fund repayments				115	19	10
				Exchange				172	3	8
	53,145	17	8					53,145	17	8

No. VI.—RESERVE FUND ACCOUNT.

Dr.	£	s.	d.		Cr. £	s.	d.
1. Amount paid out (items to be specified) . .	..			1. By balance brought from last account . .	55,000	0	0
2. Amount of balance to next account . . .	62,000	0	0	2. By amount brought from net revenue account .	4,618	19	5
				3. By interest on *amount invested* . . . (Description of investments to be specified).	2,381	0	7
	62,000	0	0		62,000	0	0

No. VII.—DEPRECIATION FUND ACCOUNT.

Dr.	£	s.	d.		Cr. £	s.	d.
To Balance	156,716	10	5	1. By Balance from last account	149,716	10	5
				2. By interest on investments	..		
				3. By amount brought from revenue account (see No. IV-G.)	7,000	0	0
				(Description of investments to be specified) .	..		
	156,716	10	5		156,716	10	5

No. VIII.—GENERAL BALANCE SHEET.

Dr.

Liabilities.	£	s.	d.
1. To Capital Amount: Account received as per Account No. III	200,000	0	0
2. To sundry creditors due on construction of plant and machinery, fuel stores, etc.	..		
3. To sundry creditors on open accounts	62,083	18	3
4. To net revenue account: balance at credit thereof	43,111	5	6
5. To reserve fund account: balance at credit thereof	62,000	0	0
6. To depreciation fund account	156,716	10	5
7. To special items (to be specified)	638	6	0
TOTAL	524,550	0	2

Cr.

Assets.	£	s.	d.
1. By Capital Account: Amount expended for works as per Account No. III	374,186	13	3
2. By stores on hand	38,176	9	0
3. By sundry debtors	21,127	8	3
4. By preliminary expenses awaiting adjustment	..		
5. By securities and held (cost price). Less profit on realization	86,688	3	2
6. By special items (to be specified) Furniture and Fixtures	1,534	3	10
7. By cash at Bankers	..		
8. By cash on hand	2,837	2	8
TOTAL	524,550	0	2

N°. IX.—STATEMENT OF ENERGY GENERATED, SOLD, etc.

Total energy generated in Kilowatt-hours & purchased from New Delhi Municipality.	Kilowatt-hours sold.					Kilowatt-hours used on works.	Kilowatt-hours not accounted for.	Total Kilowatt-hours accounted for.	Kilowatts connected for public lamps.	Total consumers connected.	Total Kilowatts connected*.	Plant installed Kilowatts.	Maximum supply demanded in Kilowatts.
	Public lamps.	By special Contract.	Consumers by meter for lighting purposes.	Consumers by meter for power purposes.	Total								
1	2	3	4	5	6	7	8	9	10	11	12	13	14
11,662,819	1,011,678	1,026,809	3,062,240	4,266,546 (includes 811,144 for Tramways and Trolley Buses.	9,367,261	249,961	1,445,597	9,367,261	28,724	15,475	19,586 approximate for tramways and Trolley Buses.	3,937	3,637

* Where the undertaking supplies power to tramways the units sold to the tramways should be treated as sold by "special contract". In calculating the Total Kilowatts connected " the Kilowatts connected exclusive of the tramway should first be ascertained ; then the Kilowatts connected to the tramway system should be assumed to bear the same ratio to the units used on the tramway as the remaining Kilowatts connected bear to their consumption.

For and on behalf of Delhi Electric Supply and Traction Company Limited,

A. W. E. LOVERING,

Director and Secretary.

APPENDIX VI-A.

DRAFT MEMORANDUM OF ASSOCIATION.

1. The name of the company is "The Delhi Central Electric Power Authority, Ltd.".

Name.

2. The registered office of the company will be situate in Delhi Province.
Office.

3. The objects for which the company is established are—
Objects.

(1) To generate and sell electric energy; in particular and without prejudice to the generality of this object,

(2) To acquire any generating stations and plants and distribution mains in Delhi,

(3) To carry on the business of electricians, mechanical engineers and manufacturers, workers and dealers in electricity, motive power and light, and any business in which the application of electricity or any like power, or any power that can be used as a substitute therefor, is or may be useful, convenient or ornamental, or any other business of a like nature.

(4) To manufacture and produce and, either as principals or agents, trade and deal in any articles belonging to or connected with any such business, and all apparatus, appliances and things used in connection therewith, or with any inventions, patents or privileges for the time being belonging to the company.

(5) To produce and accumulate electricity and electro-motive force, or other similar agency, and to supply the same for the production, transmission or use of any lighting, heating, motive or other power as may be thought advisable.

(6) To make experiments in, and public exhibitions of, electric force and lighting, and electrical machinery and appliances.

(7) To let out on hire all or any of the property of the company (whether real or personal), including every description of apparatus or appliances of the company.

(8) To carry on the business of suppliers of light, heat and power and carriers of passengers and goods.

(9) To manufacture, put up and use telephones, telegraphs (wireless or other), phonographs, dynamos, accumulators, lamps, and all apparatus now known or that may hereafter be invented, connected with the generation, accumulation, distribution, supply and employment of electricity or any power that can be used as a substitute therefor, including all cables, wires or appliances for connecting apparatus at a distance with other apparatus and including the formation of exchanges or centres.

(10) To acquire and deal with any property real or personal, to carry on any trade or business, to erect any buildings, and generally to do all acts and things, which, in the opinion of the company or the directors, may be conveniently, or profitably, or usefully acquired and dealt with, carried on, erected or done by the company in connection with the businesses aforesaid.

(11) To do all or any of the following acts or things, *viz.*, to pay all expenses of and incidental to the formation of the company; to sell, lease or dispose of any property of the company; to draw, accept and negotiate negotiable instruments; to borrow money on the security of the undertaking or on all or any of the assets of the company or without security; to invest moneys of the company in such manner as the Directors determine.

(12) To do all such other things as are incidental or conducive to the attainment of the above objects or any of them.

4. The liability of the members is limited.

5. Every member of the company undertakes to contribute to the assets of the company in the event of its being wound up while he is a member, or within one year afterwards, for payment of the debts and liabilities of the company contracted before he ceases to be a member, and the costs, charges, and expenses of winding up the same and for the adjustment of the rights of the contributories amongst themselves, such amount as may be required, not exceeding hundred rupees.

We the undersigned are desirous of being formed into a company in pursuance of this Memorandum of Association.

Name	*Address*	*Description*

Dated the day of 1937.

Witness to the above signatures :—

APPENDIX VI-B.

DRAFT ARTICLES OF ASSOCIATION.

Membership.

Number of members.

1. For the purpose of registration the number of members of the company is declared to be 100 but the Directors may register an increase in the number of members whenever they think fit.

Membership.

2. The subscribers hereto shall be the first members, and it shall rest with the Directors to determine the terms and conditions on which subsequent members shall from time to time be admitted.

General Meetings.

First general meeting.

3. The first general meeting shall be held at such time, not being less than one month or more than three months after the incorporation of the company, and at such place, as the Directors may determine.

Subsequent general meetings.

4. A general meeting shall be held once in every year at such time (not being more than fifteen months after the holding of the last preceding general meeting) and place as may be prescribed by the company in general meeting, or in default, at such time in the month following that in which the anniversary of the company's incorporation occurs and at such place as the Directors shall appoint. In default of a general meeting being so held, a general meeting shall be held in the month next following, and may be convened by any two members in the same manner, as nearly as possible, as that in which meetings are to be convened by the Directors.

Ordinary and extraordinary meetings.

5. The above-mentioned general meetings shall be called ordinary meetings; all other general meetings shall be called extraordinary.

Convening Extraordinary meeting.

6. The Directors may, whenever they think fit, and they shall on a requisition made in writing by any two or more members, convene an extraordinary general meeting.

Requisition by members.

7. Any requisition made by the members must state the object of the meeting proposed to be called, and must be signed by the requisitionists and deposited at the registered office of the company.

Meetings convened by members.

8. On receipt of the requisition the Directors shall forthwith proceed to convene a general meeting, and if they do not proceed to cause a meeting to be held within twenty-one days from the date of the requisition being so deposited, the requisitionists, or any other two members, may themselves convene a meeting.

Proceedings at General Meetings.

Notice of meeting.

9. Seven days' notice at the least, specifying the place, the day, and the hour of meeting, and in case of special business the general nature of the business, shall be given to the members in manner hereinafter mentioned, or in such other manner, if any, as may be prescribed by the company in general meeting; but the non-receipt of such a notice by any members shall not invalidate the proceedings at any general meeting.

Business.

10. All business shall be deemed special that is transacted at an extraordinary meeting, and all that is transacted at an ordinary meeting, with the exception of the consideration of the accounts, balance-sheets, and the ordinary report of the Directors and auditors, and the fixing of the remuneration of the auditors.

Quorum.

11. No business shall be transacted at any meeting unless a quorum of members is present at the commencement of the business. The quorum shall be ascertained as follows (that is to say). if the members of the company at the time of the meeting do not exceed ten in number, the quorum shall be three; if they exceed ten there shall be added to the above quorum, one for every five additional members up to fifty, and one for every ten additional members after fifty, with this limitation, that no quorum shall in any case exceed thirty.

12. If within one hour from the time appointed for the meeting a quorum of members is not present, the meeting, if convened on the requisition of the members shall be dissolved; in any other case it shall stand adjourned to the same day in the following week at the time and place; and if at such adjourned meeting a quorum of members is not present, it shall be adjourned *sine die*.

When no Quorum present.

13. The chairman of the Directors shall preside as chairman at every general meeting of the company if present or if at any meeting the chairman is not present at the time of holding the same, the members present shall choose some one of their number to be chairman of that meeting.

Chairman.

14. The chairman may, with the consent of the meeting, adjourn the meeting from time to time and from place to place, but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place.

Adjournment.

15. At any general meeting, unless a poll is demanded by at least three members, a declaration by the chairman that a resolution has been carried, and an entry to that effect in the book of proceedings of the company, shall be conclusive evidence of the fact. without proof of the number or proportion of the votes recorded in favour of or against the resolution.

Declaration by chairman and entry in minute book.

16. If a poll is demanded in manner aforesaid, the same shall be taken in such manner as the chairman directs, and the result of the poll shall be deemed to be the resolution of the meeting at which the poll was demanded.

Polls.

Votes of Members.

17. Every member shall have one vote and no more except the chairman who shall have a second or casting vote if the voting is equal.

Votes.

18. No member shall be entitled to vote at any meeting unless all moneys due from him to the company have been paid.

Restriction on Voting.

19. On a poll votes may be given either personally or by proxies; a proxy shall be appointed in writing under the hand of the appointor, or if such appointor is a corporation, under its common seal.

Proxies.

20. No person shall act as a proxy unless he is a member or unless he is appointed to act at the meeting as proxy for a corporation. The instrument appointing him shall be deposited at the registered office of the company not less than forty-eight hours before the time of holding the meeting at which he proposes to vote.

Deposit of proxy papers.

21. Any instrument appointing a proxy shall be in the following form :—

Form of instrument appointing proxy.

Delhi Central Electric Powers Authority, Limited.

I of being a member of the Delhi Central Electric Power Authority Ltd., hereby appoint of as my proxy, to vote for me and on my behalf at the general meeting of the Authority to be held on the day of and at any adjournment thereof.

Signed this day of

22. The Directors shall be; a nominee of Government; a representative of each of the following bodies :—the Delhi Municipal Committee, the New Delhi Municipal Committee, the Punjab Chamber of Commerce, the Delhi Electric Supply and Traction Company, Ltd., the Delhi Cantonment Authority and one person who shall be nominated by the industrial consumers of electric energy in Delhi Province. The Chairman shall be nominated from among these representatives by the Government. In case of equality of voting the Chairman shall have a second or casting vote.

First Directors.

23. The business of the company shall be managed by the Directors, who may exercise all such powers of the company as are not by law or by these articles required to be exercised by the company in general meeting; but no regulation made by the company in general meeting shall invalidate any prior act of the Directors which would have been valid if that regulation had not been made.

Powers of Directors.

Auditors.

24. The auditors shall be elected and their remuneration fixed annually by the company in general meeting.

Election of Auditors.

Notices.

25. A notice may be given by the company to any member either personally, or by sending it by post to him to his registered address.

Service of Notices.

26. Where a notice is sent by post, service of the notice shall be deemed to be effected by properly addressing, prepaying and posting a letter containing the notice, and unless the contrary is proved, to have been effected at the time at which the letter would be delivered in the ordinary course of post.

Time of Service.

Names, addresses and descriptions of signatories to Memorandum of Association.

Dated the day of

Witness to the above signatures

of, etc.

APPENDIX VII.

Estimate of consumption of Electricity in Delhi Province.

In Units.

Class of Consumer.	1935.			1940.			1945.		
	Old Delhi.	New Delhi	Total	Old Delhi.	New Delhi.	Total.	Old Delhi.	New Delhi.	Total.
Domestic -Lights and fans	4,089,043	1,818,694	5,907,737	6,000,000	2,200,000	8,200,000	7,500,000	2,500,000	10,000,000
Power—									
General users	3,455,396	1,189,972	4,645,368	6,000,000	1,500,000	7,500,000	8,000,000	1,800,000	9,800,000
Large industrial mills	..	..	..	6,000,000	..	6,000,000	25,000,000	..	25,000,000
Pumping—									
Irrigation	..	2,903,518	2,903,518	..	3,803,518	3,803,518	..	4,100,000	4,100,000
Filtered Water	..	..	..	..	3,920,000	3,920,000	..	5,400,000	5,400,000
Sewage	..	893,831	1,602,006	1,000,000	1,001,000	2,100,000	1,250,000	1,300,000	2,550,000
Public Lighting	708,175	..	..	..	5,343,600	5,343,600	..	6,240,000	6,240,000
Traction	811,144	..	811,144	980,000	..	980,000	1,200,000	..	1,200,000
Cantonments	..	370,461	370,461	..	400,000	400,000	..	42,5000	425,000
Total Actual Consumption	9,063,758*	7,176,476	16,240,234	19,980,000	18,267,118	38,247,118	42,950,000	21,765,000	64,715,000
Add losses in conversion mains and auxiliary plant	1,359,563	2,380,715	3,740,278	2,997,000	2,740,068	5,737,068	6,442,500	3,264,750	9,707,250
Total Units Generated	10,423,321	9,557,191	19,980,512	22,977,000	21,007,186	43,984,186	49,392,500	25,029,750	74,422,250

	1935.	1940.	1945.
Estimated maximum demand	6,000 KW	9,000 KW	12,000 KW
Estimated Load Factor	38%	55·79%	70·8%

Figure for old Delhi 1,413,629 includes units purchased from New Delhi Municipal Committee.

APPENDIX VIII.

Delhi Central Electric Power Authority.

Estimate of Expenditure on Capital Account.

Heading.	Item.	Details.	Estimated Capital Espenditure.	Total.
			Rs.	Rs.
I		*Assets of the New Delhi Municipal Committee to be acquired by the Authority.*		
	1	Power House Building including quarters .	4,84,109	
	2	Power House Plant and equipment as at present existing	4,44,382	
	3	High Tension Distributing Mains . .	2,54,996	
				11,83,487
II		*Assets of the Company to be acquired by the Authority—*		
	4	12,575 yds. 1 sq. in. Extra High Tension underground cables	..	**68,115**
III		*Plant and equipment ordered by the New Delhi Municipal Committee and expected to be in service in* 1937—		
	5	Complete Boiler Plant and sundry equipment :	3,10,000	
	6	Turbo-alternator with auxiliary equipment and switchgear.	2,75,000	
	7	Miscellaneous Workshop Plant, testing equipment, etc.	20,000	
				6,05,000
IV		*Extensions to Extra High Tension Distribution System to be taken on hand before the end of* 1938—		
	8 (1)	E. H. T. underground distributing main from the Central power station to the Company's generating station, 6,460 yds. of 0·3 sq. in. cable	93,000	
	(2)	E. H. T. underground distributing main from Central power station to existing industrial area in Subzimandi. Two cables each 8,500 yds. long with a cross sectional area of ·3 sq. in.	2,30,000	
	(3)	Extension of existing overhead transmission line to Mahrauli (4·5 miles) . . .	25,000	
	(4)	E. H. T. overhead transmission line to new Sewage Works	60,000	
	(5)	E. H. T. overhead transmission line to waterworks site (Chandrawal)	25,000	
	6)	E. H. T. Distributing Main, partly underground and partly overhead from power station to Shahdara	55,000	
				4,88,000
				23,44,602

Heading.	Item.	Details.	Estimated Capital Expenditure.	Total.
			Rs.	Rs.
		Brought forward .	23,44,602	
V		*Second stage of development to be taken in hand in 1939—*		
	9	Additional steam raising plant consisting of water tube boiler and equipment of sufficient capacity to raise 66,000 lbs. of steam per hour	4,10,000	
	10	Additional 6,000 KW Turbo-Alternator set complete with all accessories . . .	3,00,000	
	11	Three and three-quarters miles railway siding from Nizamuddin Railway Station to power station	2,10,000	
	12	Alterations and additions to power station to accommodate additional boiler plant. .	25,000	
	13	Share of cost of river training works . .	1,50,000	
	14	Coal handling and transport plant . .	75,000	
				11,70,000
VI		*Extension to E. H. T. Distribution System to be taken in hand in 1939—*		
	15	Extension of E. H. T. distributing main from existing industrial area to subsidiary areas.	85,000	
	16	Extension of E. H. T. distributing main from existing industrial area to proposed new industrial area	1,40,000	
				2,25,000
VII		*Third stage of development to be taken in hand in 1941-42—*		
	17	Additional steam raising plant of same type and capacity as that provided in Stage II .	4,10,000	
	18	Additional Turbo-Alternator Set of same type and output as that provided in Stage II .	3,00,000	
	19	Alterations additions to power station building	50,000	
				7,60,000
VIII	20	*Working Capital*	..	1,00,000
		TOTAL CAPITAL REQUIRED	..	45,99,602
		Say Rs. 46 LAKHS.		

EXPLANATORY NOTES.

Valuation of assets of New Delhi Municipal Committee and the Company to be transferred to the Central Authority.

Item No.	Item.	Valuation based on letter No. AW-36, dated the 8th May 1935 from the Government of India, Department of Industries and Labour.	Subsequent additions made by the New Delhi Municipal Committee.	Total value on 1st April 1937.	Depreciation written off.	Net value on 1st April 1937.
		Rs.		Rs.		Rs.
1	Power Station Buildings.	5,10,000	Rs. 11, 390 (Rs. 390 from 1932-33 to 1935-36 and Rs. 11,000 in 1936-37).	5,21,390	Rs. 37,281 (Rs. 31,545 from 1932-33 to 1935-36 and Rs. 5736, provided for 1936-37).	4,84,109
2	Power House Plant	7,20,000	Rs. 44,367 (additions Rs. 5,633 less Rs. 50,000 value of boiler sold and written off).	6,75,633	Rs. 2,31,251 (Rs. 1,71,320 from 1932-33 to 1935-36 and Rs. 59,931 provided for 1936-37).	4,44,382
3	High Tension Distributing Mains,	2,66,700	Rs. 19,372 (Rs. 261 in 1934-35 and Rs. 19,111 in 1935-36).	2,86,072	Rs. 31,076 (Rs. 12,004 from 1932-33 to 1934-35, Rs. 9,536 in 1935-36 and Rs. 9,536 provision for 1936-37).	2,54,996

4	Company's underground E. H. T. Mains.	The valuation of the distributing mains laid by the Company in 1926 to link its generating station with the riverside station of the New Delhi Municipal Committee has been arrived at as follows :—		
		Cost of Cables including laying, jointing and connecting, etc.	1,02,172	
		Life of cables 30 years. Period cables have been in use 10 years.		
		Depreciation to be written off.	34,057	
		Value on 1st April 1937.		68,115

NOTE.—The above valuations have been based on the assumption that assets would be taken over sometime during 1937 at their values on the 1st April 1937 If the taking over does not take place until a later period some adjustments in the valuation will be necessary.

5 & 6.—The expenditure on these items has been based on the actual cost at which orders have been placed.

7.—This provision is intended to cover the cost of miscellaneous workshop plant and testing equipment which the authority will require.

8.—The expenditure likely to be incurred on the extensions of the Extra High Tension Distributing system has been estimated on the present day prices with reasonable allowances to cover increases in the cost of materials. It is based on the assumption that large industrialists will give their support to the generating station, but if demands from large industrialists are not forthcoming, some adjustments in item 8 (2) will have to be made.

9 & 10.—The expenditure on these items of additional equipment has been based on prices at which similar equipment has been purchased.

11.—The cost of the siding has been estimated at Rs. 56,000 per mile.

12.—Some alterations and additions to the existing building will be required to accommodate the proposed boiler, and the sum provided is intended to cover the cost of these works.

13.—It is considered that river training works may be necessary to control the course of the river Jumna, and it is estimated that the capital expenditure on these works will amount to Rs. 3,00,000. It is proposed that the capital expenditure should be shared equally between the Irrigation Pumping Installation and the Central power station, the two utilities likely to benefit from the training works.

14.—The sum provided for coal handling and transport plant is intended to cover the cost of providing secondhand rolling stock or other transport appliances for the transport of the coal from the railway station at Nizamuddin to the Central power station.

15 & 16.—The expenditure for the extension of the E. H. T. distribution system proposed to be taken in hand in 1939 has been based on the assumption that during the year a decision will be reached in regard to the development of the proposed new industrial area.

17, 18 & 19.—The expenditure to be incurred during the third stage of development has been based on the cost of a 6,000 KW steam raising and generating plant, and a suitable provision to meet the cost of alterations to the power station building to accommodate the plant has been included.

20.—It is estimated that a sum of Rs. 1 lakh will be required as working capital, and provision for this amount has been made.

APPENDIX IX.

Estimate of annual expenditure and average cost in annas in which energy can be supplied in bulk.

Item.	1st Stage. 19,980,512 units egnerated. 16,240,234 units sold.		2nd Stage. 43,984,000 units generated. 38,247,118 units sold.		3rd Stage. 74,422,000 units generated. 64,715,000 units sold.	
	Expenditure.	Cost in annas per unit generated.	Expenditure.	Cost in annas per unit generated.	Expenditure.	Cost in annas per unit generated.
	Rs.		Rs.		Rs.	
Direct Charges.						
1. Coal	2,63,675	·2111	5,38,260	·1959	9,11,204	·1959
2. Water	4,470	·0036	9,840	·0036	16,640	·0036
3. Oil, waste and other stores	6,485	·0052	6,754	·0025	7,200	·0015
4. Wages find salaries	36,672	·0293	36,672	·0134	41,500	·0090
5. Repairs and maintenance	6,100	·0050	10,386	·0038	12,000	·0026
6. Management	23,544	·0189	23,544	·0086	27,000	·0058
7. Rent, Rates and Taxes	3,000	·0025	3,000	·0011	5,000	·0010
8. Share of cost of maintaining river training works	..	..	15,000	·0054	5,000	·0010
TOTAL COST OF GENERATION	**3,43,946**	**·2756**	**6,43,456**	**·2343**	**10,25,544**	**·2204**
9. Distribution	6,000	·005	6,600	·0025	7,200	·0016
TOTAL COST, GENERATION AND DISTRIBUTION	**3,49,946**	..	**6,50,056**	..	**10,32,744**	..
Cost per unit generated	..	*·2806*	..	*·2368*	..	*·222*
Cost per unit sold	..	*·3452*	..	*·2723*	..	*·2553*
Indirect charges.						
1. Interest on capital	91,672	..	1,43,985	..	1,72,500	..
Less interest earned on Depreciation Fund investment	..	..	7,685	..	35,000	..
Net interest charge	91,672	·0903	1,36,300	·0570	1,37,500	·0340
2. Depreciation provision	1,92,794	·1012	1,53,394	·0641	1,89,394	·0468
3. Contribution to Renewals Reserve, Provident and Leave Funds	20,200	·0199	20,200	·0084	20,200	·0049
TOTAL ESTIMATED EXPENDITURE	**5,64,612**	..	**9,59,950**	..	**13,79,838**	..
Average cost per unit sold	..	*·5566*	..	*·4018*	..	*·3410*

NOTES TO APPENDIX IX.

1. In the above statement the annual cost of supplying energy in bulk from the central generating station has been estimated for three stages of development, and the average cost per unit sold has been given for each stage. The figures of demand given in the Estimate of Consumption exhibited in Appendix VII have been taken as the basis of each stage in these estimates. The following notes will explain how each item of cost has been calculated.

2. *Coal.*—The consumption of coal per unit generated has been estimated at 2 lbs. on the figures of consumption shown in first stage, but as the demand on the central station increases it is anticipated that the coal consumption per unit generated will be reduced, and the expenditure of coal in the second and third stages has been based on a consumption of 1·8 lbs. per unit generated. The price of coal at the central power station in 1935 was Rs. 14-78 per ton, and this rate has been taken for the purpose of the estimate relating to the first stage. It is anticipated that owing to various circumstances the price of coal will increase in the near future, and the estimates of the expenditure on coal in the later stages have been based on coal costing Rs. 15-3-8 at the central power station bunkers. This figure has been arrived at as follows :—

	Rs.	A.	P.
Cost of coal at colliery siding	3	10	0
Railway freight	10	0	0
Departmental charge	0	1	2
Cartage to site including losses	1	8	6
Total .	15	3	8

It may be found that the above estimate of cost of coal is on the generous side, and some reduction may be possible, but it is considered desirable to frame the estimates on a basis which provides some margin for safety.

3. *Water.*—The make-up water for the boiler feed is obtained from the municipal filtered water supply. It has been assumed that the quantity of water required will be proportional to the load on the station. The expenditure on feed water in 1935-36 in the New Delhi Municipal Station was Rs. 2,460 for the generation of 10,970,820 units, and the expenditure at the different stages of development has been calculated on this figure. It will be noted that it is estimated that the expenditure on water in the third stage will reach the substantial sum of Rs. 16,640. It should be possible to instal a small filter plant in the central generating station from which suitable water for boiler feed can be obtained at a much lower cost, and some saving on this item of expenditure can be anticipated. This, however, is a matter that will require some detailed examination, and for the present the cost involved in obtaining water from the existing source has been included.

4. *Oil waste and running stores.*—The expenditure on oil waste and running stores incurred in the year 1935-36 in the New Delhi Municipal power station amounted to Rs. 5,404. This item of expenditure will not vary in proportion to the demand on the station, but there will be some increase when the proposed additional equipment is installed in the central generating station. It is estimated that the expenditure on this item will increase by 20, 25 and 33-1/3 per cent. in respect of the periods for which the estimate has been framed.

5. *Wages and salaries.*—It is considered that the following staff will be required in the central generating station :—

	Rs.
Engine Room—	
One Power Station Superintendent at Rs. 700 per month . .	8,400
Three Shift Engineers at Rs. 200 per month	7,200
Three Switchboard Attendants at Rs. 75 per month . .	2,700
Three Drivers at Rs. 75 per month	2,700
Three Pump Attendants at Rs. 40 per month . . .	1,440
Six Cleaners at Rs. 17 per month.	1,224
Wages and Salaries in Engine Room .	23,664

Boiler Room—

	Rs.
Three Serangs at Rs. 60 per month	2,160
Twentyfour coolies at Rs. 20 per month	5,760
Fifteen coal-handling coolies at Rs. 18 per month	3,240
Total wages in Boiler Room	11,160
General—	
Two Mechanic Mistries at Rs. 60 per month	1,440
Two coolies at Rs. 17 per month	408
Total	1,848
Total Salaries and Wages—	
Engine Room	23,664
Boiler Room	11,160
General	1,848
Total Wages and Salaries	36,672

When the number of units generated reaches the figure estimated during the third stage of development, some additional coolies will be required to handle the additional coal that will be consumed. The extra cost will be Rs. 4,824, making a total expenditure on account of salaries and wages of Rs. 41,496 or rounded Rs. 41,500.

6. *Repairs and maintenance and management.*—The expenditure on repairs and maintenance and management during the stages for which the estimate has been framed is estimated as follows :—

Repairs and Maintenance.

Item.	1st Stage.	2nd Stage.	3rd Stag.
Repairs to Buildings	1,240	1,500	1,500
Repairs and maintenance of plant	4,039	7,965	9,580
Painting chimney	255	255	255
Boiler Inspection	300	400	400
Telephone and Clock	266	266	266
Total	6,100	10,386	12,001

Management.

Item.	1st Stage.	2nd Stage.	3rd Stage.
Engineer and General Manager at Rs. 1,500 per month	18,000	18,000	18,000
One Accountant and Head Clerk at Rs. 120 per month	1,440	1,440	1,440
One General Clerk	720	720	720
Two General Clerks	..	..	1,440
Two Peons	384	384	384
One Peon	..	..	192
Contingencies and Audit	3,000	3,000	4,824
Total	23,544	23,544	27,000

It will be noted that no provision has been made for Directors' remuneration. It is proposed that the Chairman of the Authority shall be a Government nominee, and that the six Directors will be representatives of the various parties interested in the distribution or use of the energy supplied from the central generating station, and it is considered reasonable to assume that all will be willing to serve on the Board of the Authority without remuneration. The duties to be undertaken by the

Directors will not be of an onerous character, and it is anticipated that the occasions on which the Board of the Authority will be required to meet will not exceed four in each year.

A large management staff will not be required for the Central Power Authority as the number of consumers will be very small, and the accounts of the undertaking will be of a very simple character and in no way voluminous.

7. *Rent, rates and taxes.*—The expenditure on rents, rates and taxes has been estimated at Rs. 3,000 per annum in the first and second stages, and at Rs. 5,000 in the third stage. It has been assumed that a lease of the land on which the power station and connected buildings stand will be obtained from the Government. The area is approximately 6·24 acres, but its value is not considered high, and it is not unreasonable to expect that a lease for a suitable period will be granted at a nominal annual rental.

8. *Share of maintenance of river training works.*—The Superintending Engineer, Central Public Works Department, estimated the capital cost of river training works on the reach of the river between the Jumna Bridge and the power station at Rs. 3,00,000. Provision has been made in the estimate of expenditure on the Capital Account to finance half the expenditure as it is considered that the total cost should be shared between the two utilities benefited by these works, namely, the central generating station and the irrigation pumping installation. The Superintending Engineer estimated that during the first year or so after construction the expenditure on maintenance of the training works might be estimated at Rs. 30,000, but thereafter Rs. 10,000 a year would suffice. It is suggested that the cost of maintenance of these works should be shared in the same way as the capital cost, and, as it is expected that the training works would be found to be necessary from 1939 onwards, sums of Rs. 15,000 and Rs. 5,000 have been included in the estimates relating to the second and third stages respectively. The Chief Engineer, Central Public Works Department, who was consulted informally in regard to the cost of the proposed training works, has expressed his general acceptance of the Superintending Engineer's estimates.

9. *Distribution.*—It is proposed that the Central Power Authority should only be responsible for the maintenance of such part of the extra high tension distributing system as is used for the supply to consumers directly connected to the central power station. The maintenance of all other sections of the distribution systems in the province will be undertaken by the respective owners of the systems.

The estimated expenditure on repairs and maintenance of the portion of the extra high tension distribution system to be taken over by the Authority is as follows :—

	1st stage.	2nd stage.	3sd stage.
	Rs.	Rs.	Rs.
One Supervisor at Rs. 150 per month . .	1,800	1,800	1,800
One E. H. T. Jointer at Rs. 75 per month .	900	900	900
Two Linesmen at Rs. 30 per month . .	720	720	720
Six coolies at Rs. 17 per month . . .	1,224	1,224	1,224S
Material at Rs. 100 per month . . .	1,200	1,200	1,200
Additional material	..	600	1,200
	5,844	6,444	7,044
Rounded to Rs. .	6,000	6,600	7,200

10. *Indirect charges.*—The Central Power Authority, in addition to meeting the actual direct expenditure incurred on the generation and distribution of energy, must make provision for :—

(*a*) Payment of interest on the capital in the undertaking;

(*b*) Depreciation of its assets;

(*c*) A small Renewals Reserve;

(*d*) Provident and Leave Funds for its staff.

11. *Interest charges.*—It is proposed that the Central Power Authority should obtain the finance required for the undertaking by means of a loan from the Government of India. It is understood that such a loan will be granted, and interest will be charged at the rate of 3½ per cent. per annum.

Charges on account of interest in the periods covered by the estimate will be as follows :—

	Rs.
Capital Expenditure up to 1938—	
Assets to be taken over from New Delhi Municipal Committee	11,83,487
Assets to be taken over from the Company . . .	68,115
Additional capital expenditure in 1937	6,05,000
Capital expenditure on acount of extension of extra high tension distributing system	4,88,000
Working capital	1,00,000
Total capital expenditure during first period .	**24,44,602**
Interest charges will amount to $\frac{24,44,602 \times 3 \cdot 75}{100}$ . .	91,672
Capital expenditure up to end of 1938—	
Expenditure up to end of 1938	24,44,602
Additional capital expenditure on plant and equipment in 1939	11,70,000
Additional capital expenditure in 1939 on extra high tension distributing system	2,25,000
	38,39,602
Interest charges will amount to $\frac{38,39,602 \times 3 \cdot 75}{100}$ . .	1,43,986
Capital expenditure at end of 1941-42	**46** lakhs.
Interest charges will be $\frac{46 \text{ lakhs} \times 3 \cdot 75}{100}$	1,72,500

12. *Depreciation.*—It is proposed to adopt the straight line method for estimating the annual depreciation provision to be made for each class of asset, and the folllowing periods of life are considered reasonable :

	Years.
Buildings	100
Plant	20
Mains E. H. T. overhead and underground	30

In order to be on the safe side it will be assumed that at the end of the estimated periods of useful life the assets will have no residual value.

It is proposed to transfer to the Central Power Authority certain assets of the New Delhi Municipal Committee at the present day value of these assets. The present day value in the case of plant in the power station is considerably lower than the replacement cost of the plant and equipment, and in order that the contributions to depreciation fund may be such that the fund will be sufficient to meet the cost of replacement when this item of the assets comes to an end of its useful life, the depreciation provision on the item of assets transferred must be based on the replacement cost and not on the taking-over cost. The annual provision to cover the depreciation in the assets taken over from the New Delhi Municipal Committee may be estimated as follows :—

(*a*) *Power House Buildings.*

	Rs.
Original cost	6,14,000
Add additions since 1932	11,390
Total .	**6,25,390**

Cost of building construction in New Delhi has fallen by approximately 30 per cent. since the buildings were constructed, and the present day replacement value of the buildings can be estimated at Rs. 6,25,390—30 per cent. = Rs. 4,37,773. The building was constructed in 1925, and ten years of its useful life have already been spent. The annual depreciation provision to be set aside from the asset is therefore

Rs. $\frac{4,37,773}{90}$ = Rs. 4,864.

(b) Power Station Plant and Equipment.

Certain plant and equipment in the existing power station is obsolete and has no value. The replacement value of the plant and equipment which is useful to the Central Power Authority may be estimated as follows :—

	Rs.
Two water tube boilers with chimney feed. pumps, etc, installed in 1921 and 1924	2,60,000
One water tube boiler installed in 1929	1,00,000
Cost of erection, brickwork, flues, etc.	80,000
One 1,500 KW Turbo-Alternator Set 1924	1,25,000
Foundation cables and erection	25,000
One 3,000 KW Turbo-Alternator Set with cables and switchgear	1,30,000
Foundations and erection	30,000
Switchgear	60,000
Cables, connection and erection	50,000
Sundries, Crane, etc.	20,000
	8,80,000

It will be observed that a large part of the lives of two of the water tube boilers and the 1500 KW Turbo Alternator set is already spent, and as the estimate of capital expenditure provides funds for replacing these items of equipment which are obsolete and will not form useful units in the central power station, no provision for depreciation need be made for these items. Omitting these items, the replacement cost on which provision for depreciation should be made is :—

	Rs.	Rs.
Total replacement value		8,80,000
Deduct value of items of assets, the replacement of which is provided for in the capital account, *i.e.*,—		
2 water tube boilers, chimney, feed-pumps, etc.	2,60,000	
Cost of erection and brickwork	55,000	
One 1,500 KW Turbo-Alternator	1,25,000	
Foundations and cables	25,000	
		4,65,000
Net replacement value		**4,15,000**

The period of useful life yet remaining for assets which will be absorbed permanently in the new undertaking is 13 years, and an annual depreciation provision of Rs. 31,923 or say Rs. 32,000 will be required.

13. *High Tension Mains.*—The present day replacement cost of the portion of the extra high tension distribution system which the Central Power Authority will take over is estimated at its original cost, that is, Rs. 2,86,072, and the annual depreciation provision which must be made for these items of the assets will be Rs. $\frac{2,86,072}{20}$ = 14,304.

We may explain that certain subsidiary E. H. T. mains which are used by the Committee to supply those consumers whose annual estimated consumption is less than 500,000 units, *e.g.*, the Cantonment Authority, the Agricultural Research Institute, etc, will not be taken over by the Central Authority, and the cost of such mains not been included in our estimates.

In order to link up the generating station of the Company with the Government generating station (the New Delhi Municipal Committee's Station) at the Delhi Gate, the Company in 1926 laid two underground extra high tension cables, each of 1 sq. in. cross-sectional area. The total combined length of these cables is 12,575 yds., and the cost including laying, jointing, etc., amounted to Rs. 1,02,172. These cables have been in service since 1926, and the Company state that only on one occasion when one of them was damaged by a steam roller, has any trouble been

experienced. It is proposed that these cables should be acquired from the Company by the Central Generating Authority who will deliver energy in bulk at the busbars in the Company's generating station. It is considered that the present day replacement value of these cables will closely approximate to their original cost, and the cost of acquisition is estimated at the original cost less depreciation for the period for which the cables have been in use. We have taken the period of useful life of cables at 30 years, and as these cables have been in service for at least ten years, we consider that a fair taking-over valuation will be the original cost less 33-1/3 per cent., or Rs. 68,115. The annual depreciation to be provided for on account of these cables will be Rs. $\frac{1,02,172}{20}$ = Rs. 5,109.

The total provision for depreciation for the items of assets transferred from the present licensees to the Authority will be—

	Rs.
New Delhi Municipal Committee—	
Buildings	4,864
Plant and equipment	32,000
E. H. T. Mains	14,304
Company—	
E. H. T. Mains	5,109
Total	**56,277**

Provision for depreciation on the additional plant and extra high tension mains which it is anticipated will fall due during the first stage of development will be—

	Rs.
Plant and equipment Rs. 6,05,000 at 20 years life	30,250
Extensions to the E. H. T. Distribution System Rs. 4,88,000 at 30 years life	16,267
Total	**46,517**
Add depreciation on assets transferred from existing licensees	56,277
Total	**1,02,794**

The depreciation provision during the second stage of development will be as follows :—

	Rs.
Depreciation on plant and equipment in use up to 1938	1,02,794
Depreciation on plant and equipment installed in 1939—	
Rs. 7,10,000 at 20 years life	35,500
Rs. 2,10,000 at 100 years life	2,100
Rs. 25,000 at 100 years life	250
Rs. 1,50,000 at 100 years life	1,500
Rs. 75,000 at 20 years life	3,750
Extensions to the E. H. T. distribution system Rs. 2,25,000 at 30 years life	7,500
	1,53,394

The depreciation provision during the third stage will be—

	Rs.
Depreciation provision on plant and equipment in use up to 1939	1,53,394
Provision for plant and equipment installed after 1939—	
Plant and equipment Rs. 7,10,000 at 20 years life	35,000
Buildings Rs. 50,000 at 100 years life	500
Total provision for depreciation	**1,89,394**

It is proposed to invest the funds which will accumulate in the Depreciation Fund Account in approved Trustee Stock.

The interest which will be earned by these investments will be treated as revenue and will be shown as such in the balance sheet of the Authority. For the purpose of the estimate of the annual expenditure and average cost per unit of bulk supply, the interest on the depreciation fund investments has been accounted for by a reduction in the interest charges payable on the total capital in the undertaking. It is anticipated that it will be possible to constitute the new Central Power Authority by the 1st April 1938, and the following table shows the position of the depreciation fund from 1938-39 to 1944-45, and the interest accruing therefrom on the assumption that 3 per cent. interest will be earned :

Depreciation Fund.

Year.	Contribution.	Amount at credit of Fund.	Interest at 3 per cent per annum.
	Rs.	Rs.	Rs.
1938-39	1,02,794	1,02,794	3,083
1939-40	1,53,394	2,56,188	7,685
1940-41	1,53,394	4,09,582	12,287
1941-42	1,89,394	5,98,976	17,969
1942-43	1,89,394	7,88,370	23,651
1943-44	1,89,394	9,77,764	29,332
1944-45	1,89,394	11,67,158	35,014

14. *Renewals reserve.*—It is considered that the Central Power Authority should establish a Renewals Reserve Fund to meet unforeseen demands for minor renewals and repair over and above the provision made under working costs. A comparatively small fund will suffice for this purpose, and it is proposed to contribute an annual sum of Rs. 12,000.

15. *Provident and Leave funds.*—In order to establish a provident or insurance fund from which payments may be made to the members of the staff of the Authority (or their dependants) on retirement, and also to finance the cost of leave granted to the staff, it is proposed to set aside small sums annually for these purposes. It is estimated that 10 per cent. of the annual cost of the staff employed namely, Rs. 6,200 will suffice for such a Provident Fund, and a lump sum of Rs. 2,000 per annum is suggested as provision to meet leave granted to the superior staff of the Authority.

APPENDIX X.

Estimate of annual expenditure and average cost in annas at which energy can be sold if purchased from the Punjab hydro-electric scheme at 3·5 pies per unit.

(Demand 43,984,000 units.)

Item.		Expenditure.	Cost per unit at Central Authority's Power Station.
	Direct Costs.	Rs.	Rs.
1	Cost of 43,984,000 units at 3·5 pies per unit	8,01,792	·2917
2	Coal	13,000	·0047
3	Water, oil waste and stores	900	·0003
4	Wages and salaries	21,132	·0077
5	Repairs and maintenance of plant	7,731	·0028
6	Management expenses	23,544	·0086
7	Rents, Rates and Taxes	3,000	·0011
8	Share of cost of maintaining river training works	15,000	·0054
	Total cost at Central Authority's generation station.	**8,86,099**	**·3223**
9	Distribution	6,600	·0025
	Total cost, generation and distribution.	**8,92,699**	..
	Cost per unit at power station	..	·3248
	Cost per unit sold	..	·3735
	Indirect Charges.		
1	Interest charges at 3¾ per cent. on Rs. 26,70,000	1,00,125	
	Less interest on depreciation investment	6,390	
	Net interest charge	93,735	
	Cost per unit sold	..	·0392
2	Depreciation provision	1,10,294	
	Cost per unit sold	..	·0461
3	Contribution to Renewals Reserve, Provident and Leave Funds	15,000	
	Cost per unit sold	..	·0063
	Total Annual Expenditure	**11,11,728**	
	Average cost per unit sold	..	**·4651**

The above estimate shows the average cost at which energy can be sold if bulk supply is obtained from the Punjab hydro-electric scheme.

The following note explains how each of the items in the estimate has been calculated :

Direct Charges.—(1) The number of units to be purchased has been based on the estimated demand during the second stage of development.

(2) The consumption of coal for maintaining the steam station in readiness to be brought into service has been estimated on the assumption that the station will only be brought into use for a period of 5 days during the year, and that during the remaining days steam pressure will be maintained in a boiler.

(3) The cost of water, oil waste and stores has been estimated on the same basis as the coal consumption.

(4) The expenditure on wages and salaries has been estimated as follows :—

	Rs.
Wages an salaries :—	
Power Station Superintendent	8,400
One Shift Engineer	2,400
Two Switchboard Attendants	1,800
Two Drivers	1,800
Two Attendants	960
Two Cleaners	408
Two Serangs	1,440
Eight coolies	1,920
Five coal handling coolies	1,080
One Mistri	720
One cooly	204
	21,132

(5) *Repairs and maintenance.*—A reduction of Rs. 2,655 has been estimated in this head as the repairs and maintenance of the plant in the steam station will not be so heavy.

(6), (7) and (8). *Management; Rents, Rates and Taxes and Share of cost of maintaining River Training Works.*—No reductions in these items are anticipated.

(9) No saving will be secured in the expenditure on distribution.

Indirect Charges.—The capital expenditure which the Central Power Authority will have to meet if supply is taken from the Punjab hydro-electric scheme is estimated as follows :—

Capital cost if hydro-electric—link is established.

	Rs.
Assets of New Delhi Municipal Committee to be transferred	11,83,487
Assets of Company to be acquired	68,115
New Plant and Equipment on order	6,05,000
First extension to H. T. main	4,88,000
Second extension to distribution main	2,25,000
Working Capital	1,00,000
	26,69,602
Say	**26,70,000**

Annual gross interest charges at 3½ per cent. will amount to Rs. 1,00,125.

Interest earned on the Depreciation Fund investment will amount to Rs. 6,390, and net interest charge will be Rs. 93,735.

Depreciation provision is estimated as follows :—

	Rs.
Depreciation on existing assets	56,277
New Plant and equipment	30,250
First extension to distributing system	16,267
Second extension to distributing system	7,500
	1,10,294

Contribution to Renewals Reserve, Provident and Leave Funds has been estimated at Rs. 15,000 as the plant to be installed in the steam station will be reduced if it is used only as a standby.

Estimate of annual expenditure and average cost in annas at which energy can be sold if purchased from the Punjab hydro-electric scheme at 3·5 pies per unit.

(Demand 74,422,000 units.)

Item.		Expenditure.	Cost per unit at Central Authority's Power Station.
	Direct Costs.	Rs.	
1	Cost of 74,422,000 units at 3·5 pies per unit	13,56,651	·2917
2	Coal	18,000	·0039
3	Water, oil waste and stores	1,430	·0003
4	Wages and salaries	21,132	·0045
5	Repairs and maintenance of plant	7,731	·0017
6	Management expenses	27,000	·0058
7	Rents, Rates and Taxes	5,000	·0010
8	Share of cost of maintaining river training Works	5,000	·0010
	Total cost at Central Authority's generating station	14,41,944	·3099
9	Distribution	7,200	·0016
	Total cost, generation and distribution	14,49,144	..
	Cost per unit at power station	..	·3115
	Cost per unit sold	..	·3582
	Indirect Charges.		
1	Interest charges at 3¾ per cent. on Rs. 26,70,000	1,00,125	
	Less interest on depreciation investment	22,937	
	Net interest charge	77,188	
	Cost per unit sold	..	·0190
2	Depreciation provision	1,10,294	
	Cost per unit sold	..	·0272
3	Contribution to Renewals Reserve, Provident and Leave Funds	15,000	
	Cost per unit sold	..	·0037
	Total annual expenditure	16,51,626	
	Average cost per unit sold	..	·4082

The following note explains how each of the items in the estimate has been calculated.

Direct Charges.—(1) The number of units to be purchased has been based on the estimated demand during the third stage of development.

(2) The consumption of coal has been calculated on the same basis as for the second stage.

(3) The cost of water, oil waste and stores has been estimated at 6 per cent. of the cost.

(4) As for second stage.

(5) As for second stage.

(6), (7) and (8). No reductions in these items are anticipated.

(9) No saving will be secured in the expenditure on distribution.

Indirect Charges.—Interest earned on the Depreciation Fund investment will amount to Rs. 22,937 as shown below, and the net interest charge will be Rs. 77,188.

Depreciation Fund.

Year.	Contribution.	Amount at credit of Fund.	Interest at 3 per cent. per annum.
	Rs.	Rs.	Rs.
1938-39	1,02,794	1,02,794	3,083
1939-40	1,10,294	2,13,088	6,390
1940-41	1,10,294	3,23,382	9,699
1941-42	1,10,294	4,33,676	13,010
1942-43	1,10,294	5,43,970	16,319
1943-44	1,10,294	6,54,264	19,628
1944-45	1,10,294	7,64,558	22,937

Interest charges on the Capital, Depreciation Provision and Contributions to Renewals Reserve and Provident and Leave Funds have been estimated as for the second stage.

APPENDIX XI.

Estimate of annual expenditure and average cost in annas at which energy can be sold if purchased from the Punjab hydro-electric scheme at 2-8 pies per unit.

(Demand 43,984,000 units).

Item.		Expenditure.	Cost per unit at Central Authority's Power Station.
	Direct Costs.	Rs.	
1	Cost of 43,984,000 units at 2·8 pies per unit . .	6,41,433	·2333
2	Coal	13,000	·0047
3	Water, oil waste and stores	900	·0003
4	Wages and Salaries	21,132	·0077
5	Repairs and maintenance of plant	7,731	·0028
6	Management expenses	23,544	·0086
7	Rents, Rates and Taxes	3,000	·0011
8	Share of cost of maintaining river training works .	15,000	·0054
	Total cost at Central Authority's generating station .	**7,25,740**	·2639
9	Distribution	6,600	·0025
	Total cost, generation and distribution . . .	**7,32,340**	..
	Cost per unit at power station	..	·2664
	Cost per unit sold	..	·3064
	Indirect charges.		
1	Interest charges at 3½ per cent. on Rs. 26,70,000 .	1,00,125	
	Less interest on depreciation investment . . .	6,390	
	Net interest charge	93,735	
	Cost per unit sold	..	·0392
2	Depreciation provision	1,10,294	
	Cost per unit sold	..	·0461
	Contribution to Renewals Reserve, Provident and Leave Funds	15,000	
	Cost per unit sold.	..	·0063
	Total annual expenditure	**9,51,369**	
	Average cost per unit sold	..	·3980

Estimate of annual expenditure and average cost in annas at which energy can be sold if purchased from the Punjab hydro-electric scheme at 2·5 pies per unit.

(Demand 74,422,000 units).

Item.		Expenditure.	Cost per unit at Central Authority's Power Station.
		Rs.	
	Direct Costs.		
1	Cost of 74,422,000 units at 2·8 pies per unit	10,85,321	·2333
2	Coal	18,000	·0039
3	Water, oil waste and stores	1,430	·0003
4	Wages and salaries	21,132	·0045
5	Repairs and maintenance of plant	7,731	·0017
6	Management expenses	27,000	·0058
7	Rents, rates and taxes	5,000	·0010
8	Share of cost of maintaining river training works	5,000	·0010
	Total cost at Central Authority's generating station	11,70,614	·2515
9	Distribution	7,200	·0016
	Total cost, generation and distribution	11,77,814	..
	Cost per unit at power station	..	·2531
	Cost per unit sold	..	·2911
	Indirect Charges.		
1	Interest charges at 3½ per cent. on Rs. 26,70,000	1,00,125	
	Less interest on depreciation investment	22,937	
	Net interest charge	77,188	
	Cost per unit sold	..	·0190
2	Depreciation provision	1,10,294	
	Cost per unit sold	..	·0273
3	Contribution to Renewals Reserve, Provident and Leave Funds	15,000	
	Cost per unit sold	..	·0037
	Total annual expenditure	13,80,296	
	Average cost per unit sold	..	·3411

APPENDIX XII.

Estimate of annual expenditure and average cost in annas at which energy can be sold if purchased from the Punjab hydro-electric scheme at 2·5 pies per unit.

(Demand 43,984,000 units.)

Item.		Expenditure.	Cost per unit at Central Authority's Power Station.
		Rs.	
	Direct Costs.		
1	Cost of 43,984,000 units at 2·5 pies per unit	5,72,708	·2083
2	Coal	13,000	·0047
3	Water, oil waste and stores	900	·0003
4	Wages and salaries	21,132	·0077
5	Repairs and maintenance of plant	7,731	·0028
6	Management expenses	23,544	·0086
7	Rents, rates and taxes	3,000	·0011
8	Share of cost of maintaining River Training Works	15,000	·0054
	Total cost at Central Authority's generation station	**6,57,015**	·2389
9	Distribution	6,600	·0025
	Total cost, generation and distribution	**6,63,615**	..
	Cost per unit at power station	..	·2414
	Cost per unit sold	..	·2776
	Indirect Charges.		
1	Interest charges at 3¾ per cent. on Rs. 26,70,000	1,00,125	
	Less interest on Depreciation investment	6,390	
	Net interest charge	93,735	
	Cost per unit sold	..	·0392
2	Depreciation provision	1,10,294	
	Cost per unit sold	..	·0461
3	Contribution to Renewals Reserve, Provident and Leave Funds	15,000	
	Cost per unit sold	..	·0063
	Total annual expenditure	**8,82,644**	
	Average cost per unit sold	..	·3692

Estimate of annual expenditure and average cost in annas at which energy can be sold if purcased from the Punjab hydro-electric scheme at 2·5 pies per unit.

(Demand 74,422,000 units.)

Item.		Expenditure.	Cost per unit at Central Authority's Power Station.
	Direct Costs.		
		Rs.	
1	Cost of 74,422,000 units at 2·5 pies per unit	9,69,037	·2083
2	Coal	18,000	·0039
3	Water, oil waste and stores	1,430	·0003
4	Wages and salaries	21,132	·0045
5	Repairs and maintenance of plant	7,731	·0017
6	Management expenses	27,000	·0058
7	Rents, Rates and Taxes	5,000	·0010
8	Share of cost of maintaining river training works	5,000	·0010
	Total cost at Central Authority's generating station	**10,54,330**	·2265
9	Distribution	7,200	·0016
	Total cost, generation and distribution	**10,61,530**	..
	Cost per unit at power station	..	·2281
	Cost per unit sold	..	·2623
	Indirect Charges		
1	Interest charges at 3¼ per cent. on Rs. 26,70,000	1,00,125	
	Less interest on Depreciation Investment	22,937	
	Net interest charge	77,188	
	Cost per unit sold	..	·0190
2	Depreciation provision	1,10,294	
	Cost per unit sold	..	·0273
3	Contribution to Renewals Reserve, Provident and Leave Funds	15,000	
	Cost per unit sold	..	·0037
	Total annual expenditure	**12,64,012**	
	Average cost per unit sold	..	·3123

APPENDIX XIII.

EXPLANATORY NOTES.

Estimate of working costs of Company. (See paras. 97 and 100).

Item 1.—The units to be purchased have been estimated on the assumption that the Company will distribute 13,980,000 units, and in order to cover losses, etc., 15 per cent., has been added in order to arrive at the number of units to be purchased.

Item 2.—It has been assumed that the Company's existing power station will be retained as a standby for two or three years, and the annual cost of maintaining it has been estimated as follows :—

Fuel, oil waste and engine room stores have been estimated on the assumption that the station will work for a total period of two weeks during the year.

The expenditure on the proportion of salaries of engineers, superintendents and officers has been estimated as incurred in 1935. Wages and gratuities have been estimated at 50 per cent. of the expenditure in 1935, as a much reduced staff will suffice for operating the plant for the short periods it may be required.

The expenditure on repairs to buildings has been taken at the 1935 figure, while that on repairs and maintenance of plant has been estimated at 33-1/3 per cent. of the 1935 expenditure, as, owing to the much reduced use of the generating plant, the repairs will not be heavy.

Item 3.—The expenditure incurred on distribution in 1935 is shown in the Company's accounts at £12,811 or Rs. 1,70,813. It is estimated that the additional demand will involve some increased expenditure on this head, and an extra of Rs. 15,000 has been allowed to meet this increase.

Item 4.—The expenditure on the attendance and repairs of public lamps in 1935 amounted to £2,334-10-0 or Rs. 31,127. Increased lighting will involve some additional expenditure, and the figure of expenditure in 1935 has been rounded to Rs. 35,000.

Item 5.—The expenditure on Rents, Rates and Taxes in 1935 was £275, and the same amount has been estimated for 1940.

Item 6.—The management expenses in 1935 amounted to £9,963 or Rs. 1,32,840, and Rs. 1,35,000 has been estimated for 1940.

Item 7.—Law charges have been estimated at the rupee equivalent of £140.

Item 8.—The expenditure on miscellaneous charges has been estimated at Rs. 60,000. Some savings on this head can be anticipated as provident fund provision is included and some reductions in staff will be possible when power is obtained in bulk.

The losses on the petrol or trolley buses are not included in the estimate of expenditure, nor the profit on tramway in our estimate of revenue, as these items do not properly belong to the electrical undertaking.

APPENDIX XIV.

Estimate of rate to be charged for energy under a two-part Tariff.

Standing Charges.

	1st Stage.	2nd Stage.	3rd Stage.
	Rs.	Rs.	Rs.
1. Interest	91,672	1,36,300	1,37,500
2. Depreciation	1,20,794	1,53,394	1,89,394
3. Contributions to Reserve and Provident Funds	20,200	20,200	20,200
4. 5 per cent. of expenditure on coal	13,184	26,913	45,560
5 per cent. of expenditure on water.	223	492	832
5 per cent. of expenditure on oil waste and other stores	324	337	360
5. All salaries and wages	36,672	36,672	41,500
6. Repairs and maintenance	6,100	10,386	12,000
7. Management	23,544	23,544	27,000
8. Rent, Rates and Taxes	3,000	3,000	5,000
9. Share of River Training Works	..	15,000	5,000
10. Distribution	6,000	6,600	7,200
TOTAL STANDING CHARGES	3,03,713	4,32,838	4,91,546

Running charges.

First Stage.		Second Stage.		Third Stage.	
Estimated maximum demand 6,000 KW.	Annual charge per KW maximum demand Rs. 51.	Estimated maximum demand 9,000 KW.	Annual charge per KW maximum demand Rs. 48.	Estimated maximum demand 12,000 KW.	Annual charge per KW maximum demand Rs. 41.
95 per cent of expenditure on coal	2,50,491		5,11,347		8,65,644
95 per cent of expenditure on water, oil waste and stores	10,408		15,765		22,648
	2,60,899		5,27,112		8,88,292
Number of units sold	16,240,234		38,247,118		64,715,000
Running charge per unit sold	·257		·2205		·2196

APPENDIX XV.

DELHI CENTRAL ELECTRIC POWER AUTHORITY.

Licence 193 .

Licence granted by the Chief Commissioner of Delhi under the Indian Electricity Act, 1910, in respect of the Delhi Province to the Delhi Central Electric Power Authority, a corporate body established in 193 , having its registered office at the Power Station, Delhi Gate, New Delhi, for the supply of electrical energy in the Delhi Province, with the powers and upon the terms and conditions all specified below.

1. This licence may be cited as "The Delhi Central Electric Licence 193 ".
Short title.

2. The several words, terms and expressions to which by the Indian Electricity Act, 1910 or by the Rules thereunder, meanings are assigned shall have in this licence the same respective meanings provided that in this Licence :—
Interpretation.

(1) The expression "the Act" shall mean the Indian Electricity Act, 1910.

(2) The expression "the Government" shall mean the Government of the Delhi Province.

(3) The expression "the Licensees" shall mean and include the Delhi Central Electric Power Authority and its permitted assigns.

(4) The expression "First Annexure," "Second Annexure," shall mean the first and second annexures to this licence, respectively.

(5) The expression "deposited map" shall mean the plan or map which is signed for the purpose of identification by the Secretary to the Chief Commissioner in the Public Works Department, Delhi Province and by the applicants under the name and style of the Delhi Central Electric Power Authority and has been deposited with the Government in pursuance of the rules under the Act.

(6) The expression "other licensees" shall mean any person or persons (other than the licensees) who are duly authorised by a licence for the time being in force under the Act or other law for the time being in force in British India relating to the supply and use of electricity to supply energy to the public within the area of supply or some part thereof.

3. This licence shall come into force and have effect upon the day when the notification confirming this licence is published in the *Gazette of India*, which date is referred to in this licence as "the commencement of this licence."
Commencement of licence.

4. The area of supply shall be the Delhi Province. as shown in the first annexure and the deposited map.
Area of supply.

5. Unless herein otherwise expressly provided, energy shall be supplied under this licence only—
Purposes of supply.

(i) For power—

(*a*) To other licensees for their own purposes and in bulk; provided that the Licensees shall not be under obligation to supply energy in bulk to other licensees for the purpose of enabling such other licensees to supply any consumer requiring more than 500,000 units per annum calculated as in sub-paragraph (*b*).

(*b*) To factories within the meaning of the Indian Factories, Act, 1934, and to any Railway or other consumers provided that the Licensees shall not supply any such Factory, Railway or consumer as aforesaid unless such Factory, Railway or consumer as the case may be, shall require not less than 500,000 units per annum such amount being the *bona fide* average computed annual consumption of such Factory, Railway or Consumer.

(ii) For lighting and general purposes other than power, including the supply of energy in bulk to other licensees for distribution by them.

The energy supplied under this licence to any consumer for power may be used by such consumer for lighting and purposes other than power on his premises, pro-

vided that the energy used by such consumer for such lighting and other purposes shall not in any year exceed fifteen per centum of the total amount of energy supplied to such consumer.

(III) in the event of any difference or dispute arising between the Licensees and a distributing licensee by reason of any objection by the latter raised in any case of supply made by the Licensee under sub-clause (I) (*b*) or sub-clause (II) of this clause or in regard to the interpretation of the terms of any part of this clause, such dispute shall be referred to an arbitrator appointed by the Government on the application of either party and the decision of such Arbitrator shall be final.

Works and system of supply.

6. The systems which may be adopted for the supply of electrical energy under this licence are the following :—

(I) (*a*) A continuous current direct supply at a pressure not exceeding 250 volts between the adjacent conductors of three-wire system, the intermediate conductor being connected to earth at the transforming station but insulated at all other parts.

(*b*) A continuous current direct supply at a pressure not exceeding 250 volts between the conductors of a two-wire system.

(*c*) A continuous current direct supply at a pressure not exceeding 600 volts for power purposes where the approval of the Government is given.

(II) (*a*) A low pressure alternating current three-phase supply at a pressure not exceeding 250 volts between phases at a frequency of 50 complete periods per second.

(*b*) A high pressure alternating current three-phase supply at a pressure not exceeding 3,000 volts and at a frequency of 50 complete periods per second for power purposes where the approval of the Government is given.

(III) An extra high pressure alternating current three-phase supply at a pressure not exceeding 22,000 volts between phases and at a frequency of 50 complete periods per second. The neutral point of the transformers may, with the approval of the Government and the concurrence of the Telegraph Authority, be connected to earth.

Provided always that it shall be lawful for the Government from time to time to issue regulations dealing with the above systems, or, to authorise other systems to be adopted for the purpose of this licence. The mains and distributing mains and service lines within the area of supply shall either be underground or aerial lines, provided always that nothing in this licence shall be deemed to empower the Licensee to place aerial lines along or across any street unless and until the Government after consulting the local authority, has communicated to the Licensees a general approval in writing of the position and methods of construction of work lines.

The Licensees shall at their own cost erect and maintain sufficient guard wires at all places where any wires or mains of the Licensees shall be placed so as to cross above or be liable to fall upon or be blown on to the electric conductors of any Tramway, and when any such wires or mains cross above or are liable to fall upon or be blown on to any telegraph or telephone wire or wires the Licensees shall at their own cost erect and maintain sufficient guard wires or take such other precautions as the Director of Telegraph Engineering shall approve.

No works shall be erected by the Licensees on or near any fortified area of Military lands in the Delhi Province without the previous written consent of the Commanding Royal Engineer, Delhi Independent Brigade Area.

Power to break up Streets, Railways and Tramways.

7. The Licensees are hereby especially authorised within the Delhi Province to open or break up the streets wholly or partially repairable otherwise than by the Government or by a local authority and also the Railways and Tramways so far only as concerns level crossings and parts of the railways or tramways running along the highway on the level.

Protection for Existing Tramways of the Delhi Electric Supply and Traction Company Limited.

8. Where the exercise of the powers of the Licensees will involve the placing of any works alongside any rail of any then existing tramway of the Delhi Electric Supply and Traction Company Limited the provisions of Sections 14, 15 and 16 of the Act shall with any necessary modifications apply and have effect as if such works were placed over or under such tramway .

9. The period of notice to be given in writing by the Licensees to the Telegraph Authority under Section 17 (i) of the Act before laying down or placing within ten yards of any part of any telegraph line, any electric supply-line or other works (except as in the said Section mentioned) shall be not less than fourteen days.

Period of Notice to Telegraph Authority.

10. For the purpose of conveying and transmitting energy to any place in the area of supply the Licensees may after an order in writing has been made by the Government conferring upon them such (if any) of the powers referred to in Section 51 of the Act as may be necessary, and upon obtaining from the Government and general approval required by Section 18 of the Act, place aerial transmission lines within the area of supply approved by Government.

Transmission Line from generating station.

11. The prices charged by the Licensees for energy supplied by them to any consumer shall not exceed those stated in that behalf in the Second Annexure, or in the case of a method of charge approved by the Government in accordance with Clause X of the Schedule to the Act, such maxima as the Government may fix on approving the method. Nevertheless the Licensees may (subject to the provisions of Sections 22 and 23 of the Act) enter into special contracts for the supply of energy.

Maximum Charges.

12. Option of purchasing the undertaking accorded to the Government by Section 7 of the Act shall first be exercisable on the first day of and thereafter on the expiration of every subsequent period of ten years during the subsistence of this licence. The value of all lands, buildings, works, materials and plant of the Licensees to be paid in accordance with the said Section 7 of the Act shall be their fair market value at the time of purchase which shall be determined in case of difference or dispute by arbitration due regard being had to the various matters mentioned in the first proviso set out in sub-section (1) of the said Section 7 and there shall not be added to such value any such percentage on account of compulsory purchase as is referred to in the second proviso set out in the same sub-section.

Purchase of Undertaking.

13. The provisions contained in Clauses IV, V, VI, VIII, and XII of the Schedule to the Act shall be excepted from incorporation with and forming part of this licence; and the other provisions contained in the said Schedule shall also be excepted from incorporation with and forming part of this licence in so far as they are inconsistent with its terms.

Exclusion from licence of certain clauses in Schedule to Act.

FIRST ANNEXURE.

Area of Supply.

Delhi Province.

SECOND ANNEXURE.

In this annexure the expression unit shall mean the energy contained in a current of 1,000 Amperes flowing under an electro-motive force of one volt during one hour.

The following are the maximum prices which the Licensees are entitled to charge :—

GIPD—L 399 DofEH&L—1-11-38—150.