

PROCEEDINGS

OF THE

BOMBAY PROVINCIAL BOARD OF AGRICULTURE

HELD AT

POONA

ON THE

9TH AND 10TH JUNE 1920.



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LIST OF SUBJECTS DISCUSSED AT THE MEETING OF THE BOARD
AGRICULTURE HELD AT POONA IN JUNE 1920.

1. A short report of technical results achieved up-to-date by the Agricultural Department to be laid before the Board by the Director of Agriculture.
2. Programme of the specialists and other sections of the agricultural department for the ensuing two years to be laid before the Board by the Director of Agriculture.
3. Programme of cotton improvement as laid before Government by the Director of Agriculture (see my No. 1102, dated 27th January 1920,) as a result of the report of the Indian Cotton Committee.
4. The improvement of the manure supply in the intensively cultivated tracts of the Bombay Presidency including the development of organisation for advice as to manuring. The question of freight on manures.
5. The question of organised attacks on definite plant diseases and of further investigation into them.
6. The great prevalence of epizootic cattle diseases and the policy which should be adopted in regard to them.
7. The development of agricultural propaganda and the part which (a) the co-operative movement, (b) agricultural association and (c) district local boards can take in connection with it.
8. The lines of development of education in vernacular both specially in agriculture and general in rural areas.
9. The closer co-operation between the "development" departments (agriculture, co-operation, irrigation, sanitation, education, etc.) of Government and the methods by which it can be secured.
10. The possibility and utility of establishing divisional boards of agriculture to discuss local problems and to be conducted in the vernacular.
11. The future organisation of the work of the Agricultural Engineer.
12. The financing of the sale of pure and improved cotton by co-operative societies or otherwise.

**PROCEEDINGS OF PROVINCIAL BOARD OF AGRICULTURE HELD
IN POONA ON JUNE 9TH AND 10TH 1920.**

PRESENT :

The Honourable Mr. G. S. Curtis,
C.S.I., I.C.S., Member of Council
(President).

K. B. Bhadrapur, Esq., Personal Assistant
to the Registrar, Co-operative
Societies, Bombay, Poona.

Sardar P. K. Biwalkar.

Dr. W. Burns, D.Sc., Economic Botanist
to Government, Bombay,
Poona.

The Honourable Mr. J. C. Covernton,
C. I. E., M.A., Director of Public
Instruction, Bombay, Poona.

Bhimbhai Morarji Desai, Esq., Deputy
Director of Agriculture, Gujarat.

Rao Saheb Dadubhai Purshotamdas
Desai.

A. B. deSouza, Esq., Superintending
Engineer, Deccan Irrigation Division,
Poona.

The Honourable Rao Bahadur S. D.
Garud, B.A.

The Honourable Dewan Bahadur
K. R. Godbole, M. E.

V. G. Gokhale, Esq., L. Ag., Deputy
Director of Agriculture, Konkan.

W. F. Hudson, Esq., I. C. S., Collector
of Poona.

C. C. Inglis, Esq., B.A.I. (Dub.), Executive
Engineer, Special Irrigation
District, Poona.

The Honourable Mr. B. S. Kamat,
B.A.

G. F. Keatinge, Esq., C. I. E., I. C. S.,
Director of Agriculture, Bombay,
Poona.

J. B. Knight, Esq., M.Sc., Professor
of Agriculture, Agricultural College,
Poona.

Rao Saheb M. L. Kulkarni, Deputy
Director of Agriculture, Southern
Division, Dharwar.

R. B. MacLachlan, Esq., Executive
Engineer, Poona Irrigation District,
Poona.

Rao Bahadur Ambashankar U. Malji.

A. B. Modak, Esq..

P. C. Patil, Esq., L. Ag., Deputy
Director of Agriculture, Central
Division, Poona.

The Honourable Mr. Purshotamdas
Thakurdas, C. I. E., M. B. E.

Otto Rothfeld, Esq., I. C. S., Registrar,
Co-operative Societies, Bombay,
Poona.

D. L. Sahasrabudhe, Esq., L. Ag., B.Sc.,
Agricultural Chemist to Government,
Bombay, Poona.

C. S. Shirhatti, Esq.

M. H. Sowerby, Esq., I.C.V.D., Principal,
Bombay Veterinary College.

G. Taylor, Esq., M.R.C.V.S., I.C.V.D.,
Superintendent, Civil Veterinary
Department, Bombay, Poona.

C. H. Thiselton Dyer, Esq., M.A.,
Assoc.M. Inst. C. E., Director of
Industries, Bombay.

D. A. Thomson, Esq., C. I. E., Conservator
of Forests, Utilization Circle.

C. W. A. Turner, Esq., I. C. S., Collector
of Ahmednagar.

NOTE.

The President welcomed the members of the Board in a short speech, explaining that this was the first occasion on which a Provincial Board of Agriculture had been held, and stating that he anticipated beneficial results from the discussions in which the staff of the Agricultural Department, members of the Revenue and Irrigation Departments and a number of private gentlemen interested in Agricultural Development would take part. He pointed out that the printed notes on most of the subjects under discussion had been sent to Members and said that it was proposed to discuss the subjects in serial order.

BOMBAY PROVINCIAL BOARD OF AGRICULTURE, 1920.

Subject No. 1.

A SHORT REPORT OF TECHNICAL RESULTS ACHIEVED UPTO DATE BY THE AGRICULTURAL DEPARTMENT.

1. *General Farming Methods.*—On our various farms we have evolved systems of good clean tillage, proper rotations and adequate manuring suitable to the locality in which the farm is situated, and have standardised the same. The cumulative effects of these operations are very visible in the excellence of the crops obtained and serve as a standing demonstration of what may be achieved. The methods adopted are, year by year, brought to the notice of cultivators, and produce some effect; though it is impossible to form any accurate estimate of its extent.

2. *Implements.*—We have experimented with a large number of new implements, and have adopted those most suitable to the work which they are needed to perform in the various tracts, and to the circumstances of the cultivators. These have been brought prominently to the notice of the cultivators, who have taken up extensively the various patterns of ploughs recommended, and to a less extent, harrows, seed drills, mowers, threshers and levellers, as well as the improved furnaces, pans and other apparatus necessary for gul-making. We arrange for the sale, hire and repair of such implements in any tract, in the first instance, until it is possible to turn the work over to co-operative institutions or private agency.

3. *Manure.*—We have demonstrated correct methods of preserving farmyard manure, but without much success in securing imitation. We have proved and demonstrated the extreme value of nightsoil and poudrrette in some tracts where they were formerly wasted, with the result that they are now used to the full extent to which they are made available by the local Municipalities. We have proved and demonstrated the value of San-hemp as green manure for sugarcane, some garden crops and rice in certain tracts and have arranged for the supply of seed where necessary.

In the matter of artificial manures it has been shown that standard mixtures can be applied with great profit to sugarcane, tobacco, onions, chillies, plantains and potatoes. Various nitrogenous manures have been found profitable for rice fields and rice seed beds in various tracts, and on laterite soils, bone-meal has been most successful.

The use of oil cake as top-dressing to sugarcane and other garden crops has been extended and introduced into tracts where it was unknown before.

4. *Crops.*—We have tested and demonstrated the money-making value of various crops in tracts where they were formerly not grown, e.g., dry crop chillies in the Deccan and onions in the Konkan. A notable instance of this kind is the introduction of dry crop ground-nuts of various kinds in many parts of the Presidency, which are not only a valuable crop in themselves, but are excellent as a rotation for either cotton or jowari. In the matter of varieties Shet Parner wheat and Akola bajri have been found to give very good results, and much seed of these varieties has been provided in tracts where they were not before grown. Mass selection of seed has been shown to be profitable in the case of jowari and rice, and seed so selected has been supplied from our farms. In the matter of pure line selection, work is now being done on rice and wheat, but it is only in the case of cotton that it has hitherto been found possible to concentrate the work sufficiently to secure definite results by this method. A very large number of exotics, selections and crosses have been tested in the principal cotton tracts of the Presidency. The four kinds of cotton which we are now pushing are:—

- (a) Surat No. 1-A for the Surat District.
- (b) N. R. cotton for Khándesh and adjoining Districts.
- (c) Dhárwár No. 1 for the Kumta tract.
- (d) Gadag No. 1 for the Dhárwár-American tract.

Of these (a) and (c) are pure strains, and in the case of (b) and (d) pure strains are being selected from the successful varieties.

The advantages of these cottons over the ordinary cotton grown in the respective localities by the cultivators may be roughly summarised as follows:—

(a) Surat I-A gives 50 lbs. of seed cotton per acre more than ordinary Surat cotton. It has a superiority of 2 per cent. in ginning percentage (= 6 per cent. more lint). The lint is valued at Rs. 15 per khandi more than Surat cotton.

(b) N. R. cotton gives 100 lbs. of seed cotton per acre more than the ordinary Khândesh mixture. It has a superiority of 3 per cent. for ginning percentage (= 9 per cent. more lint). The lint fetches Rs. 20 per khandi more than Khândesh cotton on account of its colour and "bulk."

(c) Dhârwâr No. 1 gives 50 lbs. of seed cotton per acre more than Kumpta cotton. It has a superiority of 2 per cent. in ginning percentage (= 8 per cent. more lint). The lint is valued at Rs. 30 per khandi more than Kumpta cotton.

(d) Gadag No. 1 gives 50 lbs. of seed cotton more per acre than Dhârwâr-American cotton. It has a superiority of 4 per cent. in ginning percentage (= 13 per cent. more lint). The lint is valued at Rs. 5 per khandi more than Dhârwâr-American cotton.

Sugarcane deserves a word to itself. In almost every detail of the tillage, treatment, manuring and watering of the cane, and in the handling of the produce, improvements have been introduced. Apart from this some six new varieties have been shown to be very valuable for certain conditions. The public have made good use of the knowledge gained by us and imparted to them.

5. *Plant Diseases*.—A separate note is submitted on this subject. Fungoid diseases affecting grapes, betel nut, jowari and potatoes have been successfully combated on a large scale.

6. *Horticulture*.—Horticultural investigations have been carried on in the Ganeshkhind Garden, in the now closed Bassein Garden and in selected gardens belonging to cultivators. A thorough investigation has been made of all methods of propagating the mango, and the best conditions for propagation. We are now in a position to say definitely that for dry conditions enarching is best. For moist conditions, whip-grafting gives excellent plants. For the renovation of old or useless trees top-working gives good results. An ideal nursery for young fruit plants of the mango or other species has been devised.

The Bombay mango varieties have been studied, figured and classified. The pruning of the mango has been settled. We have been able to show that the flowers of the mango come on wood of any age and that pruning for fruit is out of the question, though pruning for shape is desirable in the early years of the plant's growth. We have successfully devised means and packages for long distance transport of living mango trees, and have in this manner sent them to America, Africa and Egypt.

The Bombay Presidency has several species of oranges and limes. The question of the best stock on which to bud these was exhaustively studied and the Jamburi, a sour lime, shown to be the best.

We have succeeded in discovering in Sind a nearly seedless guava which we are distributing. We have now worked out two satisfactory systems of pruning the guava, one as a low bush tree and the other on wire (espalier system). The guava lends itself to pruning for fruit as it bears its fruit on a very definite part of the young shoots.

Our studies of vine cultivation have led us to several improvements in the local systems of training the plants, and have resulted in largely increased yields. We have experimented freely with French and American vines, but these have not been a great success.

Our work on the banana has been the collection of all the varieties, and the study of the best manures and methods of cultivation. A combination of the local system of manures with a small amount of artificials has been markedly successful. We have also shown how a profitable inter-crop can be taken.

In the subject of figs, we have devised a scientific method of pruning, but have not succeeded, as we once hoped in forcing two crops into the dry season.

Our advisory work in horticulture is of large dimensions. It is a strange fact that although fruit culture is so important in many of the districts of this Presidency, the very simplest rules of soil treatment, irrigation, manuring, intercropping and pruning are often unknown or disregarded. Apart from all advanced scientific results, simple advice has had remarkable good effects on many plantations.

On several of our farms also we have established small fruit gardens where we have tested the suitability of many kinds of fruit trees to local conditions, and we distribute nursery stock of the kinds found to do well.

7. *Cattle*.—A bull breeding farm exists at Chharodi where good bulls of the Kankrej breed are bred and distributed to cattle breeders in Gujarát on terms fixed. There is a keen demand for these bulls. A similar farm is being established in the Dhárwár District for Mysore cattle, and subsequently such farms will be established for Khillari and Krishna Valley cattle. At Tegur in the Dhárwár District the effect of giving better food to the local cattle and grading them up by means of a Mysore bull has been tried. The result has been very successful, and though we started with a non-descript herd of undersized cattle, good bullocks of the Mysore type are now being produced. We procure buffalo bulls of good milking strain for dairy farmers, and keep such bulls for use by the public on some of our farms.

8. *Fodder*.—We have demonstrated the possibilities of hay-making on a large scale, and the best methods of storing hay, the storage in silos of green grass, jowari, maize and sugarcane tops. We have also worked out the best methods of fodder production, and are working at the renovation of poor pastures.

We store hay at Chharodi and shredded kadbi at Kopargaon, for use in famine time.

The system of feeding cattle on prickly pear, as an emergency fodder, which we had previously worked out, was applied with much success during the recent fodder famine, and will, doubtless, form a regular feature of cattle relief on such occasions in future.

9. *Agricultural Engineering*.—The Agricultural Engineer has located extensive sources of underground water in Upper Gujarát and parts of the Thána District, sufficient to turn these areas into a garden. He has also explored the sources of underground water in other parts of the Presidency, and shown that in many localities there is a fair chance of obtaining by boring moderate supplies of water sufficient at least for domestic purposes, and in some cases for irrigation. As a result of this boring campaign a great addition to the irrigation resources of Gujarát and Thána has been effected. Much experience in this work has been gained, and suitable implements designed.

Experiments with power plants, driving pumps, cane crushers, etc., have given valuable experience and the Agricultural Engineer has designed and erected for land-owners many such plants, and has given much advice and assistance to cultivators in the purchase, management and repair of all kinds of agricultural machinery. He also arranges for the training of fitters and engine drivers. He has worked out the problems and cost of steam ploughing in Gujarát and the Karnátak, and shown that under suitable conditions it is a business proposition.

G. F. KEATINGE,
Director of Agriculture.

Discussion of Subject No. 1.

The Honourable Dewán Bahádur Godbole stated that cultivators often complained that the results obtained on Government Farms were not applicable to their case, because they had not got the capital to apply which Government was able to use. He therefore thought that efforts should be made to apply the methods advocated to the cultivators' own fields and adapted to their resources. He instanced a case that he had heard of in Berar where a farm which formerly produced only Rs. 7,000 worth of cotton was made to produce cotton worth Rs. 23,000 and said that this was the sort of thing that was wanted. He said that the boring work done by the Agricultural Engineer was really valuable, but it was confined to a few tracts, and he would like to see this work enlarged so that the cultivators of other tracts would not have to wait indefinitely for such assistance.

The Honourable Mr. Purshotamdas Thakurdas called attention to the fact that the Departmental programmes showed that in Southern Gujarát work was being done both with Broach Deshi cotton and with Goghári cotton. He said that he would like to know what was the difference of yields between these two cottons, which paid the best and whether the Department could meet the demand for seed.

Mr. Bhimbhai Desai, Deputy Director, Northern Division, said that the ginning percentage of Goghári was 40 to 45 per cent. and of Broach Deshi 32 to 33 per cent., but that this year Broach Deshi was fetching about Rs. 150 per khandi more than Goghári, and at these rates paid better. He agreed that Broach Deshi was likely to be the more profitable cotton in the long run, and said that Goghári was being maintained on the farms only for purposes of experimental breeding, for which purposes its high ginning percentage was an important factor. As regards supply of seed he said that there was a fair supply of improved Deshi seed at Surat, but very little at Broach.

Ráo Sáheb Dadubhai Desai asked whether the horticultural staff could not effect further improvements in the mango and suggested that Government should pay more attention to popularising fruit growing in Gujarát.

Mr. P. C. Patil, Deputy Director of Agriculture, Central Division, replying to the Honourable Dewán Bahádur Godbole, stated that on our seed and demonstration farms the Agricultural Department did not spend an excessive amount of money. Accounts showed that such farms as those at Jalgaon and Kopargaon paid their own way and showed a profit. The Department, however, did demonstrate their improved methods in cultivators' fields on a large scale and he instanced 40 cotton plots in Khándesh, 40 sugarcane plots on the Deccan Canals and many others.

Dr. Burns, Economic Botanist, replying to Ráo Sáheb Dadubhai Desai, said that it would be very difficult to improve on the present varieties of the mango, that such attempts were being made on a considerable scale in Florida, but had hitherto met with no success. As regards fruit growing in Gujarát he called attention to the economic side of the question and said that except in a few big cities there was little demand for fruit in Gujarát.

Mr. Schutte, Agricultural Engineer, replying to the Honourable Dewán Bahádur Godbole agreed that the demand for well boring was in excess of his powers of compliance, and referred to his Note on subject No. 11 for discussion by the Board, pointing out that he was asking for additional staff to deal with such work on a larger scale.

Mr. K. B. Bhadrapur said that when improved implements got out of order cultivators found it very difficult to get spare parts, and suggested that spare parts should be kept at large villages with local men.

Mr. Otto Rothfeld agreed with this and said that Co-operative Societies would be glad to keep spare parts if they knew where to get them.

Ráo Sáheb M. L. Kulkarni, Deputy Director of Agriculture, Southern Division, said that the war and subsequent conditions of the markets had caused difficulties in getting spare parts in some cases, but we did stock spare parts on our farms and depôts so far as possible, and hoped that now this supply would increase.

The Honourable Dewán Bahádur Godbole said that firms like that of Mr. Modak should stock spare parts.

No resolution was passed.

Subject No. 2.

DEPARTMENTAL PROGRAMMES.

It was decided not to discuss these programmes, since many of the matters contained in them again came up for discussion amongst the latter subjects in the programme.

Subject No. 3.

PROGRAMME OF COTTON IMPROVEMENT WITH REFERENCE TO REPORT OF THE INDIAN COTTON COMMITTEE.

Letter from the Director of Agriculture to the Chief Secretary to Government, Revenue Department, Bombay, dated 17th February 1920.

Sir,

I have the honour to lay before you my proposals regarding the development of the investigation and propaganda work on cotton improvement, as instructed in Government Order No. 9419 of 12th September 1919, Revenue Department, in connection with the Report of the Indian Cotton Committee, 1919, and the Resolution of the Government of India thereon. These proposals are not concerned with Sind, as the matters on which I am asked to report in connection with that province cannot be dealt with until after a conference to be held at an early date with the Commissioner in Sind.

2. The recommendations of the Cotton Committee, so far as the Agricultural Department is concerned, indicate that the work for which it is responsible may be divided into four portions, that is to say, into (1) a survey of the cottons at present in cultivation, (2) the improvement of these cottons by selection or breeding, (3) the multiplication of the improved seed thus produced and the securing of a permanent supply of such improved seed, and (4) propaganda for the extension of the growth of the improved cottons so produced. It should be recognised that over a large part of the Bombay Presidency much has been done already in all these four directions and that what we have now largely to do is to provide for the extension of the work now being carried on, on a larger and more extended scale.

3. For all this work, in the Bombay Presidency, I propose in the first place that the country should be divided into four sections, corresponding with four definite cultural areas now growing different classes of cotton. These are (1) Northern Gujarát, the home of the Dholleras. This would include all the cotton area north of Baroda, (2) Southern Gujarát, the home of the Broach, Surat and Navsári cottons. For convenience the Panch Maháls would be included with this section, though the cotton there is not the same and the conditions are not identical, (3) Khándesh, the great Oomra area of the Bombay Presidency. With this, as the cotton chiefly grown is the same. I would include Násik, Ahmednagar and Sholápur; (4) Southern Marátha Country, where the cottons which would have to be dealt with are Kumta, Dhárwár-American and, to a less extent, Cambodia.

4. The cotton work in each of these tracts is in the hands of the Deputy Director of Agriculture for the Division which includes them. The staff employed and the present state of work is as follows:—

(a) In Northern Gujarát, little has been done, except a very preliminary survey of varieties in cultivation. No special staff is employed, the ordinary district overseers doing all that is done, with an occasional visit from the Cotton Supervisor, from Surat.

(b) In Southern Gujarát, work on selection and breeding of improved Surat and Navsári cottons has been in progress since 1904 and the investigation of Broach cotton and of the possibilities of Goghári cotton for the last five years. For this work a cotton supervisor is employed, with one graduate assistant, (temporary) for breeding work and these work in close association with the

Superintendents of the Surat and Broach Farms. Recently in connection with the crisis in the quality of Surat cotton Government have sanctioned a temporary staff of Cotton Superintendent and three graduate assistants for the extension of the cultivation of our improved strains of Surat and Navsari cotton seed and the multiplication of the supply of seed.

(c) In Khándesh the work hitherto has consisted in the selection of N. R. cotton from the Khándesh cotton mixture and the multiplication and spreading of the seed. So far it has been very successful the seed is very popular, and its extension has been taken up by the co-operative seed societies and unions. Selection has been carried further, but no further *practical* result has yet been achieved. The work here is in the hands of a cotton supervisor working along with the ordinary district staff of the Agricultural Department, who, with the Superintendent of the Jalgaon Farm (which is essentially a cotton seed farm), is responsible for the selection of cottons and also for the extension work in the district.

In Sholápur, which, though under the supervising control of the Deputy Director of Agriculture, Southern Division, nevertheless is an area dealing with Khándesh cottons, all that we are doing is multiplying and spreading the same "N. R." cotton which is being spread in Khándesh.

(d) In the Southern Marátha country the selection and breeding work is in the hands of a cotton supervisor with one graduate assistant working on the Dhárwár Farm. Seed is multiplied to a limited extent on the Dhárwár and Gadag Farms and the further multiplication and extension work is supposed to be in the hands of a Cotton Superintendent and three graduate assistants though we have not been able as yet to find men to fill all the positions temporarily sanctioned for this purpose in Government Order No. 11019 of 18th October 1919; Revenue Department.

5. In considering the increase of permanent staff now required we have to take the recommendations of the Indian Cotton Committee together with the increases of the regular staff of the Department which have taken place or been sanctioned since its recommendations were made. This makes the present proposals less formidable than those of the Indian Cotton Committee. I may say in fact that in view of the sanction now applied for from the Secretary of State by the Government of India for two new Deputy Directorships, I do not propose to proceed with the proposals of the Indian Cotton Committee (paragraph 202) for the appointment of the Deputy Directors specially for cotton. In other matters our local knowledge enables me to modify the proposal of the Indian Cotton Committee, with reduction in cost, without loss, I think, of efficiency.

6. I propose in fact as follows :—

(1) *Cotton Survey, Selection and Breeding.*

(a) One Economic Botanist, in the Imperial Agricultural Service, on the usual pay, who should have general supervision of cotton survey work, cotton selection, and cotton breeding throughout the Bombay Presidency. He would be located in Northern Gujarát, on a station to be established near Sánand (Ahmedabad), and would have sole control of breeding work in the tract north of Baroda. In other parts of the Bombay Presidency, he would be a consulting and advisory officer to the Deputy Director of each Division so far as his special work is concerned. He would need two graduate assistants.

(b) A cotton breeder should be placed in the following three centres—(1) Surat, (2) Jalgaon, (3) Dhárwár—who would work under the direct control of the Deputy Director in consultation with the Economic Botanist mentioned above. Each would be a gazetted officer in the provincial service on a pay of Rs. 200—³⁰—350 per month and would be provided with a station on the farms at the above centres, properly equipped for botanical work. We have suitable men for two of these positions in the cotton supervisors at Surat and Dhárwár—the man at Jalgaon would have to be made. Each of these men would have to be provided with a graduate assistant and the necessary other assistance.

The cost of this section of the work would be as follows:—

	Rs.
(a) Economic Botanist on Rs. 500—50—1,000 or an average of Rs. 750 per month	9,000 per annum.
Travelling allowance for Economic Botanist and staff	2,000 ..
Two graduate assistants on Rs. 75—5—100 or an average of Rs. 175 per month	2,100 ..
Cost of other staff at Rs. 300 per month	3,600 ..
Cost of apparatus and materials and office expenditure per annum	1,500 ..
Total running cost of the proposed Economic Botanist's office per annum	18,200 ..
(b) Cotton breeders at Surat, Jalgaon and Dhárwár. Three men on Rs. 200— ³⁰ / ₂ —350 or an average of Rs. 275 per month	9,800 ..
Graduate assistants to cotton breeders, three men at Rs. 75—5—100 or an average of Rs. 87½ per month	3,150 ..
Travelling allowance for three men and assistants	2,000 ..
Cost of other staff at Rs. 300 per month	3,600 per month.
Cost of apparatus and materials and office expenditure per annum	1,500 per annum.
Total running cost of proposed cotton breeders' office per annum	20,050 ..
Total cost per annum of cotton survey, selection and breeding department	38,250 ..

(2) *Cotton Seed Multiplication.*—If we accept the Cotton Committee's proposal, this will involve a number of seed farms, and the necessary staff. I am not quite sure how far all this is really necessary, but it is generally considered by the officers to be so, and I would therefore propose:—

(1) Seed Farm at Sánand in North Gujarát with necessary staff—400 acres.

The capital cost including the breeding station I estimate Rs. 2½ lákhs.

The running cost of the farm I estimate at Rs. 10,000 per annum including one graduate assistant as Superintendent.

(2) Seed Farm near Navsári in the Surat District with the necessary staff—200 acres.

The capital cost including buildings I estimate at Rs. 1,00,000.

The running cost of the farm I estimate at Rs. 5,000 per annum including one graduate assistant as Superintendent.

(3) Seed Farm in the Dhárwár District with the necessary staff—400 acres.

The capital cost including buildings I estimate at Rs. 1,00,000.

The running cost of the farm I estimate at Rs. 10,000 per annum, including one graduate assistant as Superintendent. In Khándesh the Jalgaon Farm will serve the purpose required and will also serve for Sholápur.

The total new annual running cost of this section would be Rs. 25,000 per annum, but it may be taken as certain that these seed farms will pay and that there will be a net annual profit.

(3) *Cotton Seed Distribution.*—In this it is chiefly a matter of staff and I propose that in each of the four divisions I have indicated we have a special cotton distribution staff of (1) one Cotton Superintendent gazetted on Rs. 200—⁸⁰/₂—350 assisted by four graduate assistants normally on Rs. 75—5—100.

Their duties are sufficiently described in the Cotton Committee's Report and we have already made a move in this direction in Surat and in Dhárwár. I propose also that two graduate assistants specially for this work should be added to the Deputy Director's general staff in Sholápur and Ahmednagar.

This would involve :—

	Rs.
(a) Four Cotton Superintendents on Rs. 200— ²⁰ / ₃ —350 or an average of Rs. 1,100 per month or ..	13,200 per annum.
(b) Eighteen graduate assistants on Rs. 75—5—100 or an average of Rs. 1,575 per month or ..	18,900 ..
(c) Travelling allowances	4,000 ..
(d) Office and other expenses	32,000 ..

The total running cost per annum would therefore be Rs. 39,300 for this section of the work.

All would not be needed at once, but probably would be required before five years, and Government might be asked to sanction the expense in each area as matters become ripe for it.

The total proposed cost of these developments would therefore be per annum :—

	Rs.
(1) Capital cost apart from that under (2) ..	10,000
Running cost	38,250
(2) Cotton Seed Multiplication—	
Capital cost	4,50,000
Running cost	25,000
(3) Cotton seed distribution—	
Running cost	39,300
Grand total—	
(1) Capital cost	4,60,000
(2) Running cost per annum	1,02,550

These amounts, though large, are much less than contemplated by the Indian Cotton Committee, and I venture to recommend the scheme above outlined for the sanction of Government.

Discussion of Subject No. 3.

The Honourable Mr. Purshotamdas Thakurdas stated the Director of Agriculture had asked for a considerable addition to his staff in order to produce and to introduce improved strains of cotton, as recommended by the Cotton Committee. The Indian Cotton Committee, however, had also recommended legislation controlling the movement of cotton, in order to check the fraudulent mixing of cotton. This mixing was now going on on a large scale, and much short-stapled cotton was being brought to Surat to mix with the stapled cotton there. The cotton that was now put on the market was not pure cotton, and it was of little use to introduce pure cotton in the field if it did not come to the market pure. The fault lay with the petty merchants and at the gins; and the legislation proposed by the Cotton Committee would check the abuses. Until the mixing of cotton was checked in this way he was afraid that it was a waste of money and energy to try to introduce pure strains.

Ráo Sáheb Dadubhai Desai thought that Kaira should be included in the group proposed for Broach and Surat Districts since much Broach Cotton was grown there; he also asked that a special cotton breeder for the Kaira District might be appointed.

Ráo Sáheb Ambashankar U. Malji agreed with the Honourable Mr. Purshotamdas that so long as quantities of short stapled cotton were brought by rail and road to the long stapled tracts for mixing, further expenditure on the improvement of cotton in the field would be wasted. Such movement should be checked.

The Honourable Mr. G. S. Curtis asked how he proposed to stop such movements, especially by road.

Ráo Sáheb Ambashankar U. Malji said that cotton might be checked either when leaving the village or when leaving the ginnery.

Ráo Sáheb Dadubhai Desai said that the large traders could check mixing if they refuse to buy mixed cotton.

Mr. Otto Rothfeld agreed with this and said that he was not in favour of compulsory measures. It was in his view a matter for the traders to deal with.

The Hon'ble Mr. Purshotamdas Thakurdas said that it was not the fault of the large merchants. They had to deal in whatever cotton was brought to them. It is not the large merchants who are hurt by this mixing. They get their commission whether the cotton is mixed or not. It is the cultivator who will suffer from the mixing, and is suffering now. The demand for long stapled cotton is large, but millions of bales of short stapled cotton are lying unsold, and during the past year the cultivators of Gujarat suffered a loss of about 1½ crores on this account. Where there are few merchants in the field much can be done to prevent abuses by a combination of merchants. This was effected at Tinnevely, where there were only about 10 buying firms, but in Gujarat the number of buyers is very great, and nothing but legislation would suffice.

The Honourable Mr. G. S. Curtis said that the question was whether Government was justified in keeping a large establishment for cotton breeding. The Honourable Mr. Purshotamdas Thakurdas wanted to control the movement of cotton by rail. For this co-operation between the people and Government was necessary. The Department set up to administer the old Cotton Frauds Act had failed to achieve its object. He saw many difficulties in the way of the action now proposed. Apart from the question of mixing, however, he thought that the Agricultural Department ought to maintain pure strains of cotton and to improve them.

The Honourable Mr. Purshotamdas Thakurdas agreed that the Agricultural Department should be in a position to supply pure cotton seed to cultivators and that expenditure on this object was fully justified.

No resolution was passed.

Subject No. 4.

THE IMPROVEMENT OF THE MANURE SUPPLY IN THE INTENSIVELY CULTIVATED TRACTS OF THE BOMBAY PRESIDENCY, INCLUDING THE DEVELOPMENT OF THE ORGANISATION FOR ADVICE AS TO MANURES. THE QUESTION OF FREIGHT OF MANURES.

The supply of manures in the intensively irrigated parts of the Bombay Presidency is at present deplorably insufficient. The price of cattle manure is already very high and with, on the one hand, the very large development of canal irrigation which is going on, and on the other, with the very great reduction in the number of cattle which has recently taken place, this supply will rapidly tend to become more insufficient than ever. The deficiency has been made up to a considerable extent by the use of oil cake both from the village oil-presses in every part of the Presidency, and from the oil mills which have been established in many of the large centres; and also to a less extent by the use of fish manure. But the rise in price of these substitutes has been very great and we have now arrived at a position when artificial manures compare, value for value, very favourably with the use of oil cakes or fish. Our experiments, moreover, have shown that in certain cases bone-meal seems to have specific manurial action which renders its use of special advantage: this is particularly the case with rice in the red soils of the Konkan and Kanara. If, however, artificial manures are adopted by the people it will mean that, with such expensive materials,

very much greater care will have to be taken in regard to quality and with regard to purchase than has been necessary with the relatively cheap form of manuring adopted in the past. And hence it will be necessary to develop in a way not hitherto realised an organisation both for testing materials offered for sale and for advice as to the best materials to use.

So far the only artificial manure which has been taken up on a large scale by the cultivators has been sulphate of ammonia for sugarcane. The use of this was extending very rapidly until as a result of the war the price rose to unheard-of heights. Now, however, that the price of oil cakes has also risen, it is being taken up again and 500 tons, I understand, have been disposed of, almost entirely for sugarcane, in the current season. If the price falls slightly I anticipate that next year the demand for sulphate of ammonia will be at least for 1,000 tons and possibly for a good deal more than this. Except for this one material, and for a very small demand for artificial manures for manuring cocoanuts, there has been no further development with these purely artificial fertilisers except for experimental purposes. The demand, however, for bone-meal in the rice tracts of the Konkan shows signs of real vitality, and I anticipate that it will extend and increase.

We have now in the meantime worked out a profitable method of manuring with artificial manures on many of the intensively cultivated crops in the Bombay Presidency, and the results of these experiments and recommendations based upon them will be found in the various publications of the Agricultural Department, and notably in Bulletins Nos. 76 of 1915 and 89 of 1918, copies of which will be available to the members of the Conference.

In summary, therefore, the present position as I conceive it may be stated as follows:—

(a) The demand for manures is increasing; the supply of cattle manure is now reduced and will probably not attain its old proportion for some years; prices of oil-cake and fish are very high and for the first time, value for value, artificial manures have become at least as good as any natural manure in the country.

(b) The people have already taken to the use of sulphate of ammonia and it is probable that its employment will rapidly increase at least for sugarcane. Bone-meal is being largely tried for rice: but apart from these the use of artificial manures has so far not gone beyond the experimental stage.

(c) For the adequate manuring of crops particularly in view of the large early extension of irrigated areas, artificial manures will be largely required. As their use is new and they are very expensive, it will be necessary to develop an organisation for testing such manures put on the market and for advising as to the best manures to apply in particular cases.

(d) While definite conclusions as to the best manures to use in certain crops and certain areas are available yet a considerable extension of the activity of the Agricultural Department, in investigating in this direction both on experimental farms and in cultivators' fields is desirable.

So far as an organisation for testing of manures is concerned I would call the attention of the Conference to proposals for legislation on the lines of the Fertilisers and Feeding Stuffs Act of England which are now being considered by the Government of Bombay. These proposals provide for a regular system whereby all artificial manures should be sold with a guarantee of composition and gives power to Government either on its own initiative or on the initiative of any purchaser of such manures to have samples taken and analyses made, the vendor being prosecuted if the artificial manures fails to be up to the guarantee which he has given. I should be glad if the Board could see its way clear to support these proposals. For although little artificial manure is sold at present, yet I have found within the last two or three years that a good deal of what has been put on the market has been far below the quality which the purchaser has the right to expect. I know well the difficulties of the past two or three years but I think that a purchaser has the right in the case of expensive materials like those we are discussing to be assured that they are of the quality which he expects to obtain.

With regard to the question of advice as to manures this will naturally be either by the various Deputy Directors of Agriculture or by their staff, either as a result of their own experiments or as a result of experiments undertaken by the Agricultural Department. Beyond this the Government of Bombay have already taken a step in supplying to one manure mixing factory (that of Messrs. The Union Agency at Poona) a chemist who will at same time test the manures issued by their firm and give advice on the basis of experimental results obtained by the Agricultural Department to the cultivators who apply to that firm for manures. I think that during the period when artificial manures are a new thing this method is a good one and might well be extended to other firms who establish manure mixing factories. A general control over the advice given should, however, be maintained either by the Director of Agriculture himself or by the Agricultural Chemist to Government.

Again, I think the time has come when the organisation for experiments on artificial manures throughout the Presidency on a practical basis should be extended, and that, under the direct supervision of the Director of Agriculture and on uniform lines, experiments should be undertaken on Government farms in the various parts of the Presidency and also in larger numbers on cultivators' fields. The latter system seems to have achieved considerable success in the past few years. One assistant is already almost wholly employed in organising and supervising such experiments and I think that the time has arrived for the extension of experiments on these lines.

It has been suggested that special facilities should be given in the way of grants of land, etc., to companies or others who are willing to establish manure mixing factories or manure making factories. I doubt myself whether this is necessary. I feel that if experiments and demonstrations show to the people that the use of artificial manures is profitable they will be taken up and that the factories required will quickly be supplied through ordinary commercial channels.

I might add a word about co-operative manure supply societies. Except in one or two cases I do not think that such societies have been a great success, and I am now somewhat doubtful, except perhaps in the case of the supply of certain forms of oil-cake, whether they are likely to be generally successful. The purchase of manures demands a high degree of commercial acumen and technical skill. The price varies extremely, and by no means regularly from year to year. The quality of any of the samples is difficult to determine and it seems that we have in this matter one of the forms of supply which if carried on by co-operative agency can only be a success when done on a very large scale such as has not been contemplated in the co-operative movement in this country.

The question of freight of manures has already been recently considered by the Government of India in view of a resolution passed by the Conference of Agricultural Chemists at Pusa in 1919, which reads as follows:—

“That in view of the importance of increasing the use of concentrated manures as a part of the general agricultural development of the country, the Railway Board may be approached to arrange that the present minimum rate of one-tenth pie per maund per mile should be charged in all cases of minimum waggon loads of such concentrated manures.”

The Government of India have been unable to accept this resolution, but they are so impressed with the necessity for artificial manures to be as cheap as possible that they have suggested to local governments that the railway companies should be addressed when necessary with a view to reduction in the rates at present charged for concentrated manures. As the immediate necessities of the case here are for a minimum freight for oil cake and sulphate of ammonia I would suggest that the Board request Government to address the railway authorities in this Presidency so as to obtain the minimum rate for these materials throughout the Bombay Presidency. This is essential in the case of oil cake in order that its use may not be diminished and in the case of sulphate of ammonia in order that its use may be more widely extended, and this extension has already been hindered by the very high price of the material in the districts where it is needed.

There is one aspect of the use of manures which I think should also be considered. Professor Knight has shown that the amount of manure used for sugarcane in the

canal tracts of the Deccan may be diminished without lowering the yield of sugarcane. I think that the methods which he has worked out should be more widely known and demonstrated than they are at present. Government has recently sanctioned the arrangement of a demonstration station in the Nira Valley partly for the purpose of demonstrating this method in economising manures. I suggest that the Board should advise Government that the arrangement of a similar demonstration centre in each of the Deccan canal tracts and of demonstrations in addition to the same effect, on cultivators' fields with the necessary staff to supervise them, is a matter of considerable urgency.

H. H. MANN.

Discussion of Subject No. 4.

Dr. Mann said that manures had always been scarce in this Presidency and owing to the recent reduction in the number of cattle by the famine, farmyard manure was scarcer than before. On the other hand, owing to the increase in canal irrigation, the demand for manure was increasing. To some extent fish and oil cake met this demand, but the price of these manures had gone very high, and it was becoming more profitable to use artificial manures. Sulphate of ammonia had been tried on a large scale for sugarcane and gave satisfactory results. Last year the consumption of Sulphate of ammonia in this Presidency amounted to only 500 tons, but if its price goes down a bit there will soon be a demand for 2,000 tons or more a year. The time had already come when cultivators needed protection against the sale of manures which were not what they purported to be. Firms selling artificial manures should be required to give a written guarantee as to the constituents of the manures. Another important point is the railway freight on manures. This is very high when compared with the price of the manures, and adds considerably to their cost. Government should be approached to ask the Railway Companies to charge the minimum rate on artificial manures.

Rao Sáheb Dadubhai Desai suggested that the export of bones and oil cakes should be prohibited. More experiments needed to be done with them, and a complete soil survey of the whole Presidency should be made in order to see what soils these manures would suit.

The Hon'ble Dewán Bahádúr Godbole asked the Director of Industries to state what progress was being made with the fish oil factories on the coast and whether the by-products of this manufacture could not be used as fish guano. He also suggested that it might be made a condition of receiving Government assistance for the launching of Hydro-Electric Schemes that the Company receiving such assistance should devote part of the electric power generated to the production for manurial purposes of nitrates derived from the atmosphere.

Mr. A. B. Modak said that one-third of the cost price of artificial manures was due to the charges for railway freight. It was the cultivator who had to pay for this and every effort should be made to bring down these charges to a minimum.

Mr. Thiselton-Dyer, Director of Industries, said that there was only one fish-oil factory, established at Kárwár, but it was producing excellent oil and excellent fish guano, which had been sold to the Agricultural Department.

Dr. Mann, Agricultural Chemist, said that he had examined this fish guano and found it to be very clean, dry and richer than ordinary fish manures; but that its cost was rather higher than that of ordinary fish manure. It would be tried experimentally this year.

Resolution.

It was unanimously resolved that the Government of Bombay should be approached to ask Railway Companies to charge minimum rates of freight on the carriage of manures.

Subject No. 5.

NOTE ON THE QUESTION OF ORGANISED ATTACKS ON DEFINITE PLANT DISEASES AND OF FURTHER INVESTIGATIONS INTO THEM.

In the Bombay Presidency the damage to crops by fungous diseases of various kinds is very great. Rust causes immense loss to cereals. The damage done by the vine mildew varies from 4 to 5 lakhs of rupees per annum. The losses caused by the betel palm disease (Koleroga) amount to more than 10 lakhs of rupees per annum. The destruction caused by the potato diseases (Tambora, ring disease and storage rots) is still more disastrous. It is, however, when we turn to the smuts that we find the aggregate losses amounting to more than two crores of rupees. It was therefore one of the earliest activities of the Bombay Agricultural Department to study the methods of reducing these losses, and the

results of our efforts in this direction are very encouraging. We have now come to a stage, in certain diseases at least, when unless organised efforts, to combat these diseases, are made, progress will be very slow. The following are the diseases which have been dealt with.

Smut of Jowar and Rala.—This disease which is of wide occurrence can be easily prevented and therefore the enormous losses (viz., two crores of rupees) caused by the disease can be prevented. The remedy consists in steeping the seed before sowing in 2 per cent. copper sulphate solution for ten minutes. The treatment therefore attracted the attention of the workers in the Department from the beginning and a steeping demonstration was one of the items in all the farms and agricultural shows. It was not until 1910, however, when the mycological section of the Department was created that any definite efforts were made to push on the work. In that year seed sufficient for more than 10,000 acres was treated. In 1911 the work was extended to 150 villages. This increased work naturally created a large demand for copper sulphate and in order to meet the demand small packets of the material with instructions in vernacular sufficient to treat seed for 4 acres were prepared. Since the introduction of this method the propaganda has been carried on very extensively. The packets are prepared for the Department by Mr. A. B. Modak, the Proprietor of the Union Agency, Bombay. Before the War the price of each packet was one anna but now it has been raised to two annas. The popularity of this system can be gauged from the number of packets sold.

Year.	Packets.
1913-14	4,000
1914-15	40,000
1915-16	43,455
1916-17	48,000
1917-18	8,614
1918-19	Nil (famine year).

The work is in the hands of the Deputy Directors who get it done through their District Agricultural Overseers. In many places the distribution of these packets is carried on by the help of Revenue Officers and Agricultural Associations, Co-operative Societies and many public spirited men. It is in the Karnatak that much progress has been made. In 1914-15 steeping was demonstrated in 75 villages of Sholapur District, 17 of Sátara and in 21 Taluka Headquarters of Belgaum, Bijapur and Dhárwar. In 1915-16 the propaganda was undertaken on a still more extensive scale and as a result there was hardly any important village left in the Karnatak which did not hear of the remedy or make use of it.

The work received a set back in the famine year of 1918 and requires energetic pushing to regain its former position. It is therefore suggested that it should be taken in hand on the same lines as in former years. Experience has shown that the mere sale of the packets does not mean that they will be used. What is required is the presence of somebody at the sowing time, to get the work done by the cultivators.

Koleroga or Gal disease of Betel Palm.—This disease which attacks the Betel Palms is common throughout Kánara, notably in the up-ghát talukas (Sirsi, Siddapur and Yeolapur) where it is very destructive, and also in the Dápoli Taluka of the Ratnágiri District. The disease begins usually in the rains and the affected trees shed their fruits in great number.

The disease can be controlled by spraying the fruit bunches with Bordeaux mixture (consisting of lime and copper sulphate). Spraying is usually done in the beginning of the rains and one spraying has been found to keep the disease under control. The spraying solution is put in special sprayers which are carried, on the back by the climbers, who climb the trees and spray the bunches. According to the present prices the cost of spraying per acre comes to Rs. 10 and by spending this amount a loss of 100 to 200 rupees is prevented. The Department started the spraying demonstrations in Kánara in the year 1912 and gardens were treated at Sirsi and Siddapur. All the work was done at Government cost. Three years' work sufficiently convinced the people of the efficacy of the treatment

and from the year 1915 onwards people began to treat their gardens at their own cost and now, in the Siddápur Táluka, the owners of the gardens where spraying is done willingly bear the expenses. The popularity of the treatment is evident from the fact that the number of sprayed trees has risen from 1,000 in the year 1912 to 20,000 in the year 1919. Some of the gardeners have also purchased the sprayers. While in Sirsi where treatment was restricted to only one garden at Nilekani, the continued treatment of seven years has completely kept the garden free from the disease for the last three years. In the Ratnágiri District where work has been started only at one place *Asud village*, from the year 1917, people have been quite convinced of the treatment. Three persons have purchased the sprayers. Last year the number of gardens treated was 17 and in the coming season all gardeners in the village have consented to treat their gardens. With the limited staff (3 Fieldmen) and the limited grant of Rs. 600 per year at our disposal the work has been sufficiently demonstrated and if it is to be extended on a larger scale more staff and more grant is necessary. If they are available the question arises—"On what lines should the work be conducted?" Whether should it be carried on at different places throughout the tract so as to have a wider publicity or should it be confined to particular places wherein the whole area is to be treated for some time, so as completely to control the disease. Work on the latter line will be more feasible and popular.

Potato diseases—Ring Disease.—The most important disease of the potato crop is the ring disease to control which selection of the seed tubers is the main thing. Cultivators do not practise selection and unless sound seed is supplied there is no hope of controlling the disease. The Union Agency have undertaken to raise a pedigree strain which will be nearly free from the disease and until that strain is grown in sufficient quantity so as to meet the demand there is no alternative but to depend every year on Italian seed which is said to be little attacked in the first year of its importation.

Tambora disease.—It is a serious disease of the kharif crop of potato in the Poona tract and indeed appears to be the factor which limits the spread of the cultivation of potatoes during the kharif season. It is caused by a mite but can be easily prevented either by dusting with flowers of sulphur or by spraying with lime sulphur wash. The treatment is to be given just when the disease makes its appearance and one treatment seems to be sufficient to check the disease. It is only last year that the disease was studied and remedial measures found out. In order to make the remedy widely known a few typical villages at different centres should be taken for treatment. At present spraying, though more effective, is a new process to the cultivators and it is probable that dusting with sulphur from muslin bags will be more readily accepted.

Storage rots.—It is not possible for the individual cultivator to tackle this problem as it entails certain technical knowledge and a sufficient amount of capital. The Union Agency have already undertaken this problem and every encouragement and help should be given to them as they are on the way to solve it.

Grape vine mildew.—The controlling of this terrible disease of the grapes has been one of the successes which the Department can proudly claim. Experiments were started at Násik in 1909 and were continued for three years. From 1912 onwards till 1918, the work was demonstrational. This seven years' work has raised the dying industry to a prosperous condition and now the cultivators do the spraying as one of the routine operations of the crop, at Násik which is the chief centre of grape-growing and also at Ahmednagar, Sátára and Khándesh. The spraying solution used is Bordeaux mixture. Three sprayings are given and the cost of spraying per acre comes to about Rs. 25 per acre which is nothing compared with the profits which have increased from 200 to 1,000 rupees per acre in good gardens. The security which the treatment has given to the crop has induced the people to go in for new gardens and consequently the area under grape cultivation at Nasik has been extended by over 25 per cent. The only help the people probably are in need of is the supply of spraying materials at a cheap rate.

Mildew on Jiru Crop.—The Jiru is an important paying garden crop in the Northern Gujarát but its extension is limited owing to the mildew disease, which

is very destructive to it. Experiments conducted for two years at Nadiád go to show that the disease can be prevented by a spraying with Bordeaux mixture when the crop is about two months old. An expense of 10 rupees, the cost of spraying per acre, will materially increase the cultivator's profits by the saving of the crop which means a gain of Rs. 100 to 150 rupees.

Conclusion.—In all the above diseases the present needs are increase in the areas treated and more thorough treatment of these areas. The work demands special men, or men specially deputed for certain times of the year. Organisations for buying and distributing the materials and apparatus required are essential.

W. BURNS,

Economic Botanist to Government,

Bombay, Poona.

Discussion on Subject No. 5.

At the request of the President, Dr. Burns went through the main points of his printed note, and amplified them in places.

Ráo Sáheb Dadubhai Desai thought that the Agricultural Department should appoint special fieldmen for particular tracts and eradicate the diseases mentioned once and for all. He stated that the work would be of a temporary nature, since the work would come to an end as soon as the diseases were once completely eradicated. He also suggested that the Agricultural Department should find cheaper remedies for the diseases in question.

Mr. K. B. Bhadrapur thought that the packets of copper sulphate should be kept with Co-operative Societies and Unions, with printed instructions, for their use.

Ráo Sáheb M. L. Kulkarni thought that the work should be taken up by Taluka Local Boards and that demonstrations should be given at Mámlat-dárs' Kacheries.

Mr. V. G. Gokhale stated that there were practical difficulties which accounted for the fact that the remedies recommended by the Department were not more generally taken up by cultivators. As an instance of this he referred to the spraying of supari trees for *koleroga* and said that if heavy rain fell within a few hours of the spraying the work was wasted in a large degree. It was difficult to be sure when a break in the rains was going to occur.

The Honourable Dewán Bahádur Godbole thought that there was no use asking Local Boards to take up this work, but that Village Pancháyats could do the work, when they were started. He thought, also, that this work could be taken up by Co-operative Societies, and could, with the help and advice of the Agricultural Department completely clear single villages of particular diseases.

Mr. G. Keatinge agreed with Dewán Bahádur Godbole that Local Boards would not be able to undertake work of this kind, but said that he did not think that these diseases could be permanently stamped out even in limited areas, and asked Dr. Burns whether this was not so.

Dr. Burns agreed that it was not possible to stamp out plant diseases, once for all. They could be greatly reduced by spraying and other operations, but would be liable to appear again if such operations were discontinued.

Mr. G. Keatinge said that in view of this it must be realised that the Agricultural Department could not do such work all over the Presidency. The most that it could do was to demonstrate the work for some years, and the work must then be undertaken by other agencies. The question was what agencies were willing to undertake it.

Ráo Sáheb Dadubhai Desai suggested that Taláts should be entrusted with this work.

The Honourable Mr. G. S. Curtis said that the Taláts had their hands full and could not be given additional work of this nature. The aim should be to get non-official agencies to do this work.

No resolution was passed.

Subject No. 6.

NOTE ON THE PREVALENCE OF EPIZOOTIC DISEASES AMONGST CATTLE AND THE POLICY TO BE ADOPTED IN REGARD TO THEM.

To any one directly interested it would seem rather late in the day to question the prevalence of epizootic diseases amongst cattle in this country, and, when I suggested the subject of their control as suitable for discussion by the Board of Agriculture, I did not consider that it would be necessary to emphasise the gravity of the position. Until comparatively recently the absence of cut-

and-dried statistics, and the fact that the experience of those directly affected remained to a great extent unexpressed, would excuse the failure of many to realise fully the annual loss that is occurring from this cause. Progress has been made in both these respects however in recent years. The mortality statistics published in the annual report of the Veterinary Department, while they cannot be accepted as complete, give a less speculative indication of the present position, and should be sufficiently convincing. I append a statement of the figures available for the last ten years. These should be sufficient to dispel any doubt that the control of contagious disease is a problem demanding the most energetic treatment. On perusal of these figures one would be inclined to think that in the last quinquennium the mortality had increased very considerably compared with the previous one. This is not actually the case however and the marked increase in the figures is practically entirely due to the more complete manner in which disease has been reported and investigated. That they are still very incomplete is a fact that can easily be understood when we consider the agency by which they are ascertained. Regarding public opinion, it is interesting to observe how quite lately it has been given expression to in one way and another. While the direct loss due to the death of animals from disease still remains unremarked, except in official documents, the stringency of the milk supply is exercising the minds of the urban and literate classes with the result that a good deal of attention has from time to time been called to the depletion of herds by slaughter or export. It is strange that attention should alight on factors the good or evil economic influence of which is highly debatable, while the enormous dead loss from contagious disease should excite little or no comment. In this respect therefore a little ventilation of the actual position in regard to disease might be useful in guiding public opinion and action in a more truly beneficial direction in the matter of stock conservation. When we consider that while the cattle that are exported or slaughtered are selected and surplus stock, whose value still remains to the country, there is no discrimination in the case of mortality from disease, which entails not only an enormous dead loss in cattle but almost incalculable damage and loss from dislocation of work, etc., there can be no doubt in any mind as to which calls for the most earnest consideration. It is not easy to put in figures what this loss might be but a moderate estimate in sterling of the actual loss in cattle alone based on our figures of the last five years in the Presidency Proper would be £500,000.

Further labouring of a fact that has been more or less patent to the most casual observer for the last half century should not be necessary to the consideration of the question whether all is being done that should be to mitigate the evil.

Before discussing the question of policy in regard to the control of epizootic disease amongst cattle, it would be as well to review briefly the history of what has already been done, in order to appreciate what the policy of Government has been hitherto.

About the middle of last century mortality amongst cattle from disease was occupying the attention of many European countries including the United Kingdom. In 1868 a Commission was appointed to report on diseases in cattle in India and the measures required for their prevention and treatment. The result was the publication in 1871 of a very interesting report, with voluminous appendices of highly instructive evidence in which the whole question was dealt with from every aspect in a very elaborate manner.

The influence of this report on any attempt of Government to deal with the question is rather obscure, and it would seem that no definite move to carry out any of the Commission's recommendations was made until nearly 20 years afterwards. This was probably due to the want of convincing evidence as to the urgency of the demand for any attempt to put into operation proposals that were largely impracticable, or, where they were practicable, would entail a very heavy expenditure. Amongst other things, the commission strongly emphasised the need for spreading veterinary knowledge in the country, and, in 1882, when the Agricultural Department was organised, this need was commended to the attention of the new department. In Government of India despatch No. 21 of April 1882 the importance of taking measures for the investigation and treatment of cattle disease throughout India was urged by Lord Hartington but financial stringency

prevented any definite scheme being adopted. The question seems to have been discussed by various committees—in 1883, and again in 1885—but it was not until the scheme for handing over horse-breeding operations to the Civil Administration in the Revenue and Agricultural Department was adopted that the horse-breeding department, as it then existed, offered itself as a nucleus of a Civil Veterinary Department. The proposals for expanding the horse-breeding department to embrace the duties of dealing with cattle disease and veterinary instruction were detailed in Government of India despatch No. 82 (Revenue and Agriculture), dated 21st October 1891, and were sanctioned by the Secretary of State in 1892. This was the first real step towards the execution of any of the recommendations of the Commission on Cattle Plague made in 1871. The scheme entailed the appointment of 18 Imperial Veterinary Officers, a number admittedly inadequate for the work that the department was required to undertake, the excuse being that strict economy in a costly superior staff was necessary to the development of an adequate indigenous agency. Now although it has been more or less recognised, the need for a Veterinary Department, whose primary function would be to deal with diseases of animals in India, this scheme must be regarded more as an expedient for the more adequate conduct of horse-breeding, which was always urged as having the first and paramount call upon the attention of the department, rather than as a convincing attempt to deal with the problem under discussion. There seems to have been a lack of faith in the possibilities of rendering effective Veterinary Service in India which was ultimately given expression to by the Commission on horse-breeding. It was on the strength of such an expression of opinion that an attempt was made to reduce the staff of the Veterinary Department when horse-breeding was taken over by the Remount Department. A fortunate feature of the department as constituted, however, was the embodiment of a bacteriological branch. The remarkable progress made in ascertaining the nature of the diseases affecting stock in the country, and in evolving methods for their treatment, has had a very far-reaching effect. Further, as facilities were made available for the treatment of animals the demand for Veterinary Service immediately asserted itself. The result was that it was not difficult to produce abundant evidence in refutation of the idea that any attempt to render veterinary aid to stock owners in India was impracticable.

It took a considerable time for the Veterinary Department to be thoroughly established, and, as an agency for dealing with cattle diseases, it had to work under the greatest difficulties. Perhaps the most prominent result of the working of the department was the thorough realization, by all engaged in the work, of the necessity of an adequate native agency to any effective progress. At the instigation of the Inspector General of the Department the question of organizing an adequate Subordinate Veterinary Service was referred by the Government of India to Provincial Governments for consideration in 1893. What was considered necessary then by the Government of India was that the services of a Veterinarian should be available in each Tahsil or Taluka in India. This proposal was discussed at great length by the Government of Bombay but it was not till 1905 that the proposals were entertained. The result was that, in 1907, a scheme was sanctioned for the Government of Bombay for the provincialization of a pensionable Subordinate Veterinary Service that was ultimately to provide a Veterinary Assistant for each Taluka in the Presidency, with a more or less efficient supervising staff. Before this scheme came into force there were 34 dispensaries, *i.e.*, Veterinary Assistants, in the Presidency, and one Inspector. Now we have 64 taluka dispensaries with 88 Veterinary Assistants (of whom 20 are a leave reserve), 5 Veterinary Inspectors and one Deputy Superintendent. This brings us up to the present position in regard to the provision of Veterinary aid as a means for dealing with cattle diseases in the Presidency. It is the only direction in which any action has been taken, and, only from a study of its development can we get an idea of what has been the policy hitherto in regard to the problems entailed.

This brief review of the history of the department does not indicate much except that the slowness marking its progress would show, that, as a solution of the question of reducing the mortality from contagious disease amongst cattle, the spread of Veterinary knowledge was not regarded with much faith. Perusal of the correspondence that marked its history shows that throughout there was

always a considerable element of expediency in its development. In regard to Bombay Presidency itself, from the beginning, the prevailing attitude seems to have been that the duty of Government ended with the provision of facilities for training men who should work as private practitioners or in the employment of local bodies. This policy of placing the responsibility (or the greatest share of it) of providing veterinary service on local boards, while it was realised that local board finances could not bear the burden, would indicate that, although a scheme was ultimately accepted whereby a modicum of the requirements for veterinary service would be afforded, there was a lack of any determination to see the scheme carried out. Throughout, the manner in which the measure of possible progress of the department was subordinated to financial and other expediencies, almost without reference to, or consideration of, its requirements for the work that it was supposed to do, raises a doubt as to whether Government ever seriously entertained any policy based on a complete consideration of the problems involved. Thus the scheme adopted in 1907 was regarded as unnecessarily generous, and, at the present rate of its development, it will take another 26 years before it will be completely carried out.

In considering the question therefore the first essential is to secure a more correct attitude towards it. I do not mean to infer that the need for energetic treatment of this question is not realised to a considerable extent but it appears that the fundamental truth is not fully realised that, in a country like India, where the people themselves fail to apprehend the nature of the problems involved, and where there is practically no articulate public opinion, to effect any progress with sanitary measures, whether amongst human beings or animals, the driving force must come from a paternal Central Government. Only those directly engaged in work of this nature can realise with what degree of the spirit and enthusiasm of the missionary it must be attacked and the little response that can be obtained. I am not unaware of the progress that has been made with public organization in the form of agricultural and co-operative associations but only too often the life and soul of these organizations are embodied in a very meagre sprinkling of individuals and they are not sufficiently established and active to take up the burden of this work. For some considerable time to come the responsibility must remain with the Central Government and if only this fact were fully realised a considerable step forward will have been taken.

With these remarks we can proceed to consider the lines which a more active policy should take:

If we hark back to the report of the Cattle Plague Commission, to the only occasion in which the problem seems to have been fully discussed, we find that, while the ultimate ideal of "stamping out" was recognised to be impossible of attainment, a certain degree of repression was regarded as more practicable than anything that could be done on protective lines. The limitations to the application of such a policy in India were then discussed in the greatest detail, and, except that the Madras Government passed an act for the control of contagious disease which remained until only recently a dead letter, nothing was done on these lines. The position is vastly changed now, however, and while practically the same difficulties remain in the way of a suppressive policy the progress made in our knowledge of the nature of the diseases concerned and in evolving methods of preventive and curative treatment, renders a protective policy the more feasible. So far as any policy has been followed hitherto it has been perforce on protective lines, but the time has come, when, without again unnecessarily discussing in detail, measures which may be correct and thorough in principle, and the difficulties in their application, we should review the position and see to what extent a combined policy of protection and repression is indicated and practicable in the light of past experience.

It has been along these lines that the efforts of the Veterinary Department have been directed. It has been our endeavour to introduce methods of protection and other sanitary measures such as segregation and disinfection as domestic habits. As their adoption by the people is purely voluntary our attitude is of necessity that of the missionary, our work being largely educative. The only tangible representation of the results is to be found in the inoculation returns published annually. It is not so easy to show what success has been attained in

introducing repressive measures, but I fear that we cannot claim to have effect very much in this direction. The success that has been attained with the introduction of anti-inoculation is interesting, however, as establishing the acceptance of such methods by the people in spite of strong initial opposition. Perhaps, this fact shows, better than can be done in any other way, that anti-inoculation is an effective method of dealing with epizootics, for there is no doubt that its popularity is due to the proximate nature of the results and their easy apprehension compared with what can be demonstrated by other sanitary measures too irksome to be carried out. The full utilization of such methods must therefore be regarded as one of the chief instruments in dealing with epizootic diseases, and one of our chief considerations must be how this work can pass from the educative stage to become more effective. As it is conducted at present it has many shortcomings. If we compare the inoculation figures with the mortality statistics for the whole Presidency we find that the latter are not affected notwithstanding a very considerable increase in the former. This of course is due to improvement in reporting mortality statistics from year to year, and they are still too incomplete to form a basis of estimating the effect of the work. To get an idea of this it must be investigated in the field in individual outbreaks. But even then we are forced to the opinion that, while under favourable conditions anti-inoculation is very effective, it is on comparatively rare occasions that the work can be done in circumstances essential to its success. This is largely due to the fact that the work is carried out on a voluntary basis, but one of the chief reasons why more success has not been attained is the inadequacy of the staff to cope with the demand for their services. Now, whether the work is to remain voluntary or not, if the application of modern methods of preventive treatment is to be regarded (and to me it seems it must be) as one of the chief aims of our policy, it would be as well to recognise at once the need for an adequate and properly organised Veterinary staff. It is possible that the habit of viewing such a proposition from a purely financial aspect will raise in the minds of a few a doubt as to whether the country can afford such a luxury. To allay any doubts on this score, however, I should like to point out that the value of an efficient veterinary service to a country like India is not limited by what it can effect in dealing with contagious diseases alone. Reference to the past work of the Veterinary Department, as it has hitherto existed, should be sufficient proof of this. Not only has it been responsible for any progress that may have been made in stock-breeding but the following figures show what has been done in the matter of treating all classes of stock for every-day non-contagious ailments, which, it is well-known, cause very considerable loss.

Year	Staff.	Inoculations performed and per cent. per man.		Treated on tour and per cent. per man.		Treated at the dispensaries and per cent. per man.		Contra-tions.
		Inoculations.	Per cent.	Treated.	Per cent.	Treated.	Per cent.	
1908-09	33	6,897	209	15,083	484.3	56,550	1,713.3	15
1918-19	64	29,509	461.07	53,426	834.7	1,36,426	2,131.6	1,470

It is difficult to put in figures the value of this work and it can only be appreciated by careful observations in the field. What the above figures do show, however, is that the work has increased in direct proportion to the facilities made available; and, when we consider that the effective sphere of influence of a Veterinary Assistant, with a well-equipped hospital, so far as this class of work is concerned, is practically limited to an area of 6 to 8 miles radius, we can see what an enormous field still remains untouched in the Presidency. In point of fact the success that has been attained in this respect has forced upon us, who are engaged in the work, the feeling that it is in this direction that our services are of a greater economic value to the country than what we can do in regard to epizootics under present conditions; and it only bears out the opinion shared by many that a complete veterinary service, adequately trained in modern ideas of Zootechny generally, must be essential to the economy of India which is so dependent on her agricultural stock, the capital value of which, in Bombay Presidency alone, I estimate at roughly, £50,000,000 sterling. There should therefore be no compunction on the ground of expense.

in accepting the more rapid development of the Veterinary Department as part of our policy. Further, from the nature of the work that is required to be done, an important point to be recognized is, that the standard of skill and training necessary should not be governed by financial expediency but should be based on scientific progress in the matter of animal hygiene and sanitation generally.

Granted that an efficient veterinary service be provided we have had sufficient experience to know, that, without that its operations are backed up by the force of law, it must remain to a large extent ineffective, and much valuable time and energy will have been wasted.

Without suggesting that elaborate legislative measures for the control of disease are feasible, no matter how desirable they may be, I should like to indicate how certain simple measures might be introduced with considerable advantage.

The first essential to dealing with disease in any manner is early information. There can be no doubt that much of our work remains sterile at present owing to the dilatory manner in which the incidence of disease is reported. This is one of the multifarious duties of the village Patel, but only too often is it neglected until a Veterinary Assistant has visited his village on information of the presence of disease already having reached him from other sources. This neglect cannot be regarded as due to any failure to apprehend the presence of disease and its serious consequences, although this is the excuse usually offered, but to a complete apathy to public interest. There is, on these grounds I consider, sufficient justification for fixing the responsibility of reporting disease and making its neglect punishable.

The importance of early reporting cannot be too strongly emphasised, because, on sufficiently early receipt of information hangs the possibility of applying other measures that may be desirable. Such measures would include the control of movement and segregation of sick animals; etc., and, as the difficulty and inconvenience of applying such measures are in direct proportion to the area to which they apply, it is very important that action should be taken before the disease spreads to any extent. In fact I doubt very much if the proper application of repressive measures would be practicable if the area extended much beyond the village. So far as measures of this nature are necessary in amplification of protective methods, I am inclined to think that it would not be impossible to adopt the village as a sort of unit area to which they might apply. Even now our figures denoting the number of outbreaks reported really represent the number of villages affected. I should even go so far as to say that if action were taken early enough the focus of infection could be reduced to the household, in which case matters would be simpler still.

As to the measures necessary they need not be very elaborate. The first to consider is the control of movement of sick animals or their isolation. Hitherto it has been considered necessary for this purpose to establish special pounds. Pounds would not be necessary however if the restrictions were applied within a reasonable time of the first appearance of the disease, and, in the majority of cases, it would be more practicable and convenient for sick animals to be confined to their own households. The danger of further spread of the disease in the village could be immediately controlled by inoculating all the healthy animals. Even the healthy animals in the same stable with the sick could thus be protected. On inoculating, however, we often find that a certain number of animals, although apparently healthy, develop the disease shortly after inoculation, showing that they must have been in the incubative stage of the disease when inoculated. In this way the presence of the disease is often prolonged beyond the period of immunity conferred by inoculation, rendering re-inoculation necessary. In fact it would be necessary to re-inoculate every fortnight or three weeks until at least a fortnight after the disease has disappeared. To prevent the disease spreading to other villages it would appear necessary that no cattle should be allowed out of the infected village. Where inoculation is carried out however such restriction need only be confined to the animals living in infected stables or yards, both sick and apparently healthy, as we find that most of the cases in which the disease appears after inoculation or those which have lived in the same stable with sick animals, that is, which have come in very close contact with the disease.

It will be seen therefore that complete inoculation of all healthy animals, and re-inoculation if necessary, is the essential to success, and restriction of

movement is subordinate to the extent to which it can be carried out. A question for consideration therefore is whether it should not be made possible to enforce its acceptance by law. Such an idea I fear will raise terrors in the hearts of some but if we examine the question carefully we find that there is really nothing inherent in the operation to which any valid objections could be taken. The manner in which it has been accepted in all parts of India on a purely voluntary basis, with never a complaint, should be sufficient proof of this. In our experience we find that any objection to its use is usually met when it is first introduced, and, if the people are not too busy and can put up with the little trouble it entails, their suspicion can as a rule be allayed by a little tactful persuasion—especially if we arrive on the spot before the disease has run a prolonged course. Cases of flat refusal can generally be traced to the machinations of the ubiquitous obstructionist playing upon the superstitions of the people out of sheer truculence. Where it has once been carried out successfully the people are as a rule glad to come and ask to have inoculation done again as necessity arises. Any objection that could be raised to such a step could only be based on sentiment which would die down in a very short time.

In addition to these measures there is the disposal of infective material. In this respect comparatively simple methods of disinfection would be necessary but what is most urgently required is to control the disposal of infected carcasses. It is not necessary to describe the present custom, and its attendant evils, whereby such carcasses become the perquisites of the village Chamars. Not only are what may be regarded as their legitimate methods of disposal to be condemned but the custom lends itself to appalling abuse and cases are by no means unknown where Chamars have actually spread infection maliciously to the great loss of agriculturists. If India can lay claim to any progressive tendency at all surely the removal of such a weakness in her domestic economy is not unthinkable.

Although repressive measures on these lines would supplement to a very advantageous extent our protective methods, there still remains the wider question of prevention of the spread of infection from neighbouring States and provinces, grazing grounds, cattle fairs and by dealers, herds, etc. From this aspect the facilities for the spread of disease appear almost unlimited. Inadequacy of staff has prevented the Veterinary Department from seriously tackling this question, and it will be some time before we have the necessary information on which to base anything like practicable proposals for dealing with it. Meanwhile I should prefer that discussion be confined more to protective measures on the lines I have tried to indicate.

The possibility of introducing legislation of this nature in India, to my mind, is apt to be regarded with unnecessary pessimism. We know there are difficulties to be overcome which it is the habit to sum up in the general statement that the country is not yet ripe for it. It is by no means a new departure, however. Madras Presidency has had an Act passed for the control of contagious diseases since 1866, and although it may have remained to a large extent a dead letter it was there when opportunity arose for putting it into operation. This opportunity arrived with the development of the Veterinary Department, and now, I am led to believe, it can be used with considerable advantage. It only requires to be altered in accordance with modern conditions to make it very useful indeed. In Burma also a similar act is in operation. Again all over India we have had the Glanders and Farcy Act and other similar acts in operation for some considerable time and our experience of their working should have a reassuring effect on those especially who anticipate difficulties in the form of corrupt abuse of powers conferred by such legislation. Perhaps the most reasonable objection is the want of a competent agency by which any measures that may be enacted can be operated. This should largely be removed, however, when we have the village Panchayats the constitution of which is now under consideration. The question is so intimately concerned with the domestic economy of the village that the Village Panchayat should be a very competent authority for the administration of legislative measures on these lines. In fact the execution of a duty of this nature would be an excellent training for these new councils, and I would suggest that to include this amongst the other duties prescribed in it would render the Village Panchayat Act more complete. It would help to develop a sense of responsibility to public interest which is so much wanting in this country.

Without attempting to deal with the problem of the control of contagious diseases in cattle exhaustively, I have tried to indicate, in general terms, the lines on which, to my mind, a practical policy might take. My views may be summed up as follows:—

1. To meet the increasing demands of the agricultural and other allied industries the adequate control of contagious diseases of animals calls for immediate and energetic action.
2. The responsibility in this respect must remain for a considerable time to come with the Central Government.
3. A combined policy of protection and repression, if adequately carried out, offers the best prospect of success under present conditions.
4. To carry it out, a sufficient and adequately trained veterinary staff, with the supplementary legislation to enable the full utilization of all modern protective methods of treatment, should be created with expedition.

G. TAYLOR,
Superintendent, Civil Veterinary Department.

Year.	Equine.						Bovine.						Others.		
	Glanders.	Anthrax.	Surra.	Dourine.	Others.	Total.	Rinderpest.	F. & M. disease.	H. S.	B. Q.	Anthrax.	Others.	Total.	Other ovines.	Total.
1909-10	0	1	325	..	4	336	1,520	62	3,651	1,125	523	137	7,018	..	..
1910-11	6	..	411	..	3	420	2,249	79	3,292	623	752	153	7,148	..	..
1911-12	4	3	141	..	3	151	1,810	83	1,779	1,609	538	..	5,817	..	..
1912-13	0	1	84	..	3	44	2,200	139	704	211	674	28	4,006	..	..
1913-14	13	3	127	..	1	144	2,103	153	1,008	167	495	4	3,930	..	..
Total	35	8	1,038	..	14	1,095	9,882	566	10,434	3,735	2,980	322	27,919	..	..
1914-15	43	..	116	..	1	160	6,833	99	1,494	198	594	..	9,203	15	15
1915-16	5	..	145	..	3	153	13,158	291	1,157	1,024	379	49	18,068	14	14
1916-17	36	..	56	..	6	98	18,509	294	2,229	4,180	452	21	25,608	35	35
1917-18	91	..	230	..	11	332	13,944	349	5,323	848	158	3	20,625	165	165
1918-19	5	..	149	..	3	167	8,597	435	689	273	185	14	10,393	..	..
Total	180	..	696	..	24	900	61,051	1,658	10,892	6,523	1,758	87	81,957	229	229

Discussion on Subject No. 6.

Mr. G. Taylor referred to his printed note and said that he would be glad to know the opinion of the Board as regards the proposals made therein.

The Honourable Dewán Bahádur Godbole asked whether it was suggested that legislation should be introduced making the inoculation of cattle compulsory, in the case of epizootic diseases, and on *Mr. Taylor* replying in the affirmative said that he considered that such legislation would be premature.

The Honourable Mr. Purshotamdas Thakurdas said that the quality of the cattle in this Presidency was fast deteriorating, and that Government was to some degree responsible for this. He asked what was the opinion of experts on this point and expressed his view that it was due to the slaughter of good milk animals in Bombay, which are sold to butchers when they go dry. Milk was becoming steadily scarcer and dearer. This also he attributed to the cause mentioned above. He regarded the situation as very serious.

Mr. G. Taylor said that he could hardly agree with the above view. It was very difficult to say whether cattle were deteriorating or not, but he did not know what evidence there was that deterioration was going on. It was true that milch cattle were slaughtered in Bombay when they went dry; but this usually happened when milch cattle were brought to a town, because it did not pay to keep dry animals in a town. The price of milk had risen all over the world. He did not think that Government were neglecting the question of cattle.

Mr. G. Keatinge said that milch animals certainly were slaughtered in Bombay when they went dry; but considering that these animals were drawn from Gujarát, Káthiáwár and Northern India, he did not think that the number slaughtered could be regarded as very serious in relation to the number of cattle of those areas. The question was considered by a Dairy Committee held in Poona a few years ago, which came to the conclusion that so long as milch cattle were kept in Bombay, this slaughter would continue, and that the proper way to deal with the problem was to keep the cattle away from Bombay and to bring in the milk by train. He hoped that the Board would express an opinion as to *Mr. Taylor's* proposals for legislation to deal with cattle diseases.

The Honourable Mr. B. S. Kamat said that the people were not yet ready for legislation either to make the reporting of diseases compulsory or to make inoculation compulsory. The history of plague showed how difficult it was to make people recognise the value of inoculation, while as regards compulsory reporting, the people would not know what diseases were contagious and what they have to report.

The Honourable Dewán Bahádur Godbole agreed with *Mr. Kamat*, but thought that when Panchayats were established they might be of use in the matter of reporting diseases.

The Honourable Mr. B. S. Kamat asked whether legislation of the nature proposed, which had been undertaken in Madras and Burma, was not a dead letter.

Mr. G. Taylor replied that the Madras legislation had remained a dead letter until the Veterinary Department was strong enough to deal with epizootic diseases; but now that the Veterinary Department in Madras had been strengthened, the legislation was found very useful. He did not know what had happened in Burma.

Ráo Sáheb Dadubhai Desai thought that a Veterinary Dispensary should be established in each taluka, and until that had been done there was no use introducing legislation.

Discussion on Subject No. 7.

"THE DEVELOPMENT OF AGRICULTURAL PROPAGANDA AND THE PART WHICH (A) THE CO-OPERATIVE MOVEMENT, (B) AGRICULTURAL ASSOCIATION AND (C) DISTRICT LOCAL BOARDS, CAN TAKE IN CONNECTION WITH IT."

No printed note was submitted to the Board.

Mr. Otto Rothfeld stated that till recently the Co-operative agencies had confined their efforts mainly to the provision of credit. They were now establishing other kinds of societies on co-operative principles, and hoped to have societies for helping the agriculturists in buying implements, seed, etc., and in selling their produce. Such societies should be kept in close touch with the Agricultural Department. Some Urban Banks are talking of establishing Dispensaries. This needs close touch with the Medical Department. In Sind Co-operative Societies are trying to remove irrigation difficulties. This needs close touch with the Irrigation Department. Societies are also starting night schools. This needs help from the Educational Department. So far as agricultural propaganda is concerned he thought that the Unions might perform the function of the *Syndicat Agricole* in France. Each Union would form a rural club for the study of agricultural problems and for propaganda, and would have its primary societies grouped round it. Closer touch is needed between the Co-operative Department and other Departments concerned. Indeed the Co-operative Department is not really a Department, but a huge popular movement needing technical help from the Departments that can give it.

The Honourable Mr. B. S. Kamat said that the present agricultural Associations were only nominal bodies. They had no funds, could not employ trained men, and did very little work. Without funds they would never be able to do much. He read a Report showing that the Agricultural Organisation Society in England received a grant of £12,000 annually from Government and was asking for an increase in the grant. He proposed that a strong Society of this kind should be formed, and that Government should supply funds to make its working successful.

Mr. J. B. Knight said that it was not possible for a Central Department to get into touch with all individual cultivators, and that he found by experience that the Agricultural Associations which we had known did not fill the gap, and that in many instances they did nothing at all. He thought that it would be very useful if the Agricultural Department and other Departments availed themselves of the machinery of the Co-operative Societies for propaganda work, and said that other Departments could easily keep the Registrar informed on the matters on which the Societies could undertake such work.

The Honourable Ráo Bahádúr S. D. Garud said that he entirely agreed with Mr. Kamat. Agricultural Propaganda should not be left to private charity, but Government should find the necessary funds. The Agricultural Department had very few overseers and it was necessary to enlist unofficial agency in the propaganda work. The Co-operative Department would provide the machinery for this, and the Agricultural Department should provide the funds.

Mr. K. B. Bhadrapur said that Co-operative Societies already did a good deal of agricultural propaganda work, and it would be quite possible to arrange that they should do more.

Ráo Bahádúr Ambashankar U. Malji agreed with the previous speakers. The Co-operative Societies and Unions could certainly help, especially with the quasi-commercial work of the Agricultural Department, but the Agricultural Department must be prepared to find them funds, as Societies doing this kind of work would require whole-time workers.

Ráo Sáheb Dadubhai Desai thought that work of Agricultural propaganda should be handed over to District Local Boards.

Mr. G. Keatinge welcomed the offer that Co-operative Societies and Unions should undertake the work of agricultural propaganda, and thought that the time had come when agricultural associations might be merged into Co-operative Societies, and pointed out that in some countries Co-operative Societies undertook the most extensive agricultural propaganda and did all the work that could be expected from agricultural associations.

Mr. V. G. Gokhale said that in the Konkan agricultural Associations were a failure, and might with advantage be merged into the Co-operative Unions, provided that the latter were prepared to have demonstration plots and do some useful work.

Mr. Otto Rothfeld welcomed the idea of merging agricultural associations into Co-operative Unions, and believed that the latter could undertake propaganda work with success.

Mr. P. C. Patil said that some of the Agricultural Associations in the Central Division had funds and were doing good work and asked whether it were proposed to abolish them.

Rao Sáheb M. L. Kulkarni said that in Southern Division also some Associations were doing good work and needed to be encouraged and not abolished.

Mr. G. Keatinge said that there was no question of abolishing Agricultural Associations which were doing good work, but that he thought generally that advantage could be gained by merging their activities with those of Co-operative Institutions which had funds and were prepared to take up the same kind of work.

The Honourable Mr. G. S. Curtis said that the Heads of the two Departments could arrange for making the link between the Agricultural Associations and the Co-operative Unions.

The following Resolution was proposed by the Honourable Mr. B. S. Kamat, and carried :

Resolution.

" This Conference recommends that there should be secured greater co-relation between the Agricultural Department and the Co-operative Department than at present for purposes of propaganda work and Agricultural Co-operation, and such Associations should be guided, supervised and financially helped by Government in suitable cases."

Subjects Nos. 8 and 9.

LETTER FROM THE DIRECTOR OF PUBLIC INSTRUCTION, No. 16397, DATED 16TH FEBRUARY 1920, TO THE SECRETARY TO GOVERNMENT, EDUCATIONAL DEPARTMENT, BOMBAY.

With reference to paragraph 3 of Government Order No. 7048, Revenue Department, of 4th July 1918, I have the honour to enclose reports from Inspectors and extracts from communications from certain of the district officers consulted and to offer the following remarks :—

2. The Educational Inspector, Northern Division, points out that Agriculture was taught in High Schools as long as 1881-86 and was attempted in primary schools about 12 years ago. Both efforts proved failures not for lack of teachers and equipment but because public opinion was opposed to a policy under which a highly technical subject was forced upon schools intended for general education. Similarly the 'Rural Standards' and the 'Agricultural Readers' proved also unpopular and were discontinued. The Inspector, therefore, is against the production of a special agricultural syllabus or agricultural text-books for use in ordinary primary schools. He would not teach agriculture in vernacular standards IV and downwards, but favours the establishment in each district of a special agricultural primary school on the lines of that at Loni. As regards the points raised in paragraph 10 of the resolutions of the Conference the Inspector accepts those relating to the inclusion of nature study in the course of rural schools, the adjustment of all subjects to the needs of rural life, the provision of a school garden for rural schools, the institution of vacation courses by the Agricultural Department for the benefit of rural teachers. As regards other points he explains that in Gujarát primary schools are already staffed largely by men from rural areas and enlected primary teachers are appointed to the Inspecting staff, that if agriculture is not to be introduced into the primary stage a special training school for teachers

will not be wanted, and that there is no objection to recruit for the Inspectorate a larger number of graduates in Science or Agriculture although the supervision of agricultural schools should necessarily remain with the Agricultural Department.

3. Of the district and other officers consulted by the Educational Inspector, Northern Division, Mr. Hood (Collector, Kaira) accepts suggestions (a) to (e) in resolution no. 10 of the Conference, as do Mr. Smart (Collector, Panch Mahals) and the President of the Broach District Board. The views of Mr. Emanuel (then) President, Surat District Board, are attached. While he accepts the principles underlying (b), (c), (d), he sees difficulties and as regards (e) is not sure that rural teachers should be trained apart from urban. In this last matter he differs from Mr. Smart who holds that the training of rural should be quite distinct from that of urban teachers. The President, Thana District Local Board, does not favour school gardens because most school masters have no idea of gardening. He insists on the necessity of separate training for rural teachers and accepts suggestions (a) and (b). Mr. Bala, Principal, Training College for Men, Ahmedabad, would not have separate text-books for urban and rural schools but would revise the present series so as to adapt it better to rural needs. He accepts suggestions (a), (b) and (c) but is opposed to separate training institutions for rural and urban teachers.

4. Mr. Hungund, Educational Inspector, Southern Division, urges that nature study is necessary for urban as well as rural schools. He is opposed to a restriction of outlook to merely rural matters in the teaching of the three staple subjects to rural pupils and he states that the Collectors of Dhárwár and Kolába (Messrs. Haig and Bharucha) agree with him. He accepts suggestion (c) but refers to difficulties of finance and irrigation. As regards (d) he quotes Mr. Haig: apparently the Inspector and Collector agree that the staff in rural schools should not be restricted to "Castes practising agriculture". The rest of the suggestions of the Conference Mr. Hungund accepts. Mr. Pratt, lately Educational Inspector in Sind, is opposed to the adoption of separate text-books for urban and rural schools but would revise the present books. He accepts suggestion (a), but as to (b) considers that there is a risk of pushing a platitude to an illogical extreme. He does not favour gardens for village schools and as regards (d) points out that in Sind most teachers are drawn from the rural population and that not a few of the Inspecting staff come from villages. He is quite opposed to separate training for rural teachers and sees no advantage in vacation courses in agriculture for rural teachers but would not object to the inclusion in the Inspectorate of Science or Agricultural graduates if "the men appointed are capable in other ways".

5. Of the district officers consulted in Sind, Mr. Rothfeld (Collector, Sukkur) would have nature study in urban rather than rural schools. He favours suggestions (c), (d), (e), (f), and has no objection to (b), as regards (g) while recognising the desirability of having some rural representative on the Inspectorate, he lays stress on the necessity of recruiting generally the highest qualified University men therefor, and doubts the usefulness of Science or Agricultural graduates, in this connection. The views of other district officers were forwarded later by the present Inspector Mr. Grieve. I attach copies of statements by the Collectors of Karachi, Hyderabad, Thar and Párkar and Lárkána, which are of some special interest. It will be noted that these Collectors are all opposed to the direct teaching of agriculture in ordinary schools and indeed to the "over-agriculturalising" of the school-courses generally. While the Collectors of Karachi and Lárkána practically accept (with certain qualifications) the suggestions of the Conference; the Collector of Hyderabad is definitely opposed to (b) and (e), does not believe in the practicability of (a) and (c) and deems (d), (f), (g) and (h) merely the expression of "Pious hopes" which as such, may be endorsed. The Deputy Commissioner, Upper Sind Frontier, writes that "The previous effort made in Sind in this direction, i.e., rural standards, was a complete failure and while the proposals now made are in theory excellent I do not feel there is much chance of putting them into practice". He holds that suggestions (d), (e), (g) and (h) are those that should be taken up first so as to ensure close touch between the countryside and the Educational and Agricultural Departments. The Collector of Nawabsháh thinks the resolution admirable in principle but that much will depend on their execution. He would devote one section of each Reader used in rural schools to "rural subjects" and

teach such lessons in the open air either in the school garden or the fields. But he is opposed to the restriction of the school course of rural subjects exclusively. He would have a separate body of teachers trained differently from the existing teachers.

6. Mr Lory, Educational Inspector, Central Division, rightly points out that a perusal of the synopsis of the Vernacular Readers will show that a large proportion of the lessons deal with rural or "natural" subjects and that village schools are by no means exclusively attended by agriculturalists. He is in favour of suggestions (a), (b) and (c) and would make nature study compulsory in training colleges and all schools with second year trained teachers. Every school should have a garden and grants for school gardening should be given. As regards (d) he accepts the principle but adds that full effect cannot be given to it at present. He accepts also (e) but does not consider separate training institutions for rural teachers feasible. The end desired, he suggests, might be gained by a system of alternatives in the courses of our District Training Schools. He accepts (f) subject to modification. As regards (g) he considers that suitable men from rural communities should be preferred for the inspecting staff but that men should not be selected simply because they belong to such communities. At the same time he lays stress on the necessity of recruiting as highly qualified graduates as possible for this purpose. He thinks that the Training Colleges should be brought into closer touch, with primary schools and that their staffs should be recruited rather from the inspecting staff than from the ranks of High School teachers. In regards to the appointment of graduates in Science or Agriculture as Inspectors or District Deputy Inspectors he points out that what we require for these posts are men of all round qualifications and administrative capacity.

7. The general conclusions that seem to emerge from the above correspondence are :—

(i) That the revival of the direct teaching of agriculture or the old special rural standards in ordinary schools is neither necessary nor desirable :

(ii) That while a 'ruralization' of the courses in ordinary vernacular schools is desirable, at any rate in rural areas, it should not be carried to such extremes as to disgust the non-agriculturalist portion of the rural community with such schools or to deprive the agriculturalist altogether of possibilities of enlarging his horizon and his ideas of things other than local. For instance it should not entail the general exclusion of history and geography though it might render it advisable in some schools to convey information in these subjects through the reading series rather than by direct and separate lessons :

(iii) That, in spite of a certain volume of opinion on the other side, the creation for rural schools of a separate cadre or special teachers trained separately from other vernacular teachers and of a separate school course with separate text-books, even if desirable in itself (which is certainly open to doubt), is scarcely practicable under present conditions and those under which the Educational Department will have to work in the nearer future and would entail large expenditure which could probably be applied better in other ways. On the other hand a more liberal admixture in the teaching and inspecting personnel dealing with primary schools of men recruited from the genuinely agricultural classes is, within reasonable limits, desirable, as also is the inclusion in our "readers" of rural topics likely to appeal to and practically to benefit children in rural schools. At the same time it has to be recognised (a) that the countryside holds other occupants than mere agriculturalists, (b) that because a person by caste or occupation is not an agriculturalist he is not therefore necessarily out of sympathy with or unable to appreciate rural conditions, and (c) that, if certain recent researches in the Southern Division, are to be relied on, an unduly large proportion of the rustic population has no definite occupation at all and does only the very minimum of work (if any). Apparently important as agriculture is, it does not afford full-time employment to a large number of rural "hands," whose labour, therefore, should be available if necessary for other (e.g., industrial) purposes and whose outlook therefore should not be concentrated exclusively on the land. In view of these circumstances it would seem hardly wise to tie the rural schools to restricted courses and over-specialised text-books or too

severely to limit the personnel that deals with them for the benefit of particular interests and classes :

(iv) That gardens are very desirable adjuncts of rural schools, especially for the practical application of nature study, provided that they can be maintained without undue difficulties and expense and that they are properly laid out and used. The latter proviso postulates expert guidance and supervision for which we must look to the Agricultural Department unless we can have (as some other provinces have) a corps of educational officers specially trained in school-garden work and detailed as peripatetic teachers and inspectors or until our ordinary teachers and inspecting staff have had adequate training in this subject, which latter requirement presupposes that special instruction should be given in it at Training Institutions by competent instructors :

(v) That closer co-operation between the Agricultural and Educational Departments in matters pertaining to rural education is indicated. Separate training, colleges for rural teachers are not, I think, essential but the Agricultural Department might be asked to advise upon particular schemes for Nature Study and School Gardening in use at the several existing training Institutions and to inspect the actual instruction (both theoretical and practical) given therein. It might also advise generally upon the alternatives in the courses of studies at Training Institutions which should be open to rural teachers. It must be remembered in this connection, however, that teachers passing out of the training schools and colleges are liable to serve under Municipalities as well as Local Boards and that a student cannot always tell whether his lines will fall in the town or country. One other way in which the Agricultural Department can materially assist would be to subject these lessons, in our vernacular reading series which deal with rural or nature-study topics, object lessons, and so forth, to a critical survey with the object of suggesting such corrections, additions, substitutions, or other improvements as it might find necessary or desirable. On the other side if (as seems very desirable) each district is to have its vernacular agricultural school, such schools may be used as training grounds in rural subjects for ordinary school teachers and the lower ranks of the Educational Department's inspectorate, men being deputed to such schools to study both methods and matter. It might also be possible for suitable teachers to be interchangeable between these schools and Local Board vernacular schools. Similarly interchanges between the Inspectorate of the Agricultural Department and the primary inspecting personnel of the Educational Department might also be tried.

8. Until the general lines of procedure are settled it is not easy to make particular recommendations. In this connection I venture to solicit reference to paragraph 6 of my No. 15722 of 5th February 1920, dealing with the question of 'wastage' in our primary schools. I have therein proposed that in the management of our vernacular schools and the shaping of their courses much more scope should be given than heretofore to 'local option' and that the instrument to hand for this purpose is the panchayat. If this proposal is approved the same general principle obviously applies to the questions now under consideration. In the event suggested, the country side after consultation with the Educational and Agricultural Departments would be enabled with certain general limits to decide for itself what it wanted to have taught in its schools. So far we have tried to dictate from outside and from above and the result has not been a conspicuous success. It seems time now to allow those most concerned (who, whatever else they may lack, are not devoid of shrewdness and common sense) to have not merely a voice in the discussion but also a hand in the execution in the matter. In no other way are we more likely to cultivate a living interest and to awaken a genuine sense of responsibility among those for whose benefit the schools exist.

9. Subject to my remarks in paragraph 8, I offer the following more specific suggestions :—

(i) Nature Study should be compulsory in all schools possessing a teacher trained in the subject. The provision of a garden is not a *sine qua non* for this purpose.

A Syllabus in school-gardening 'nature study for training schools and colleges' and also for primary schools have already been drawn up and sanctioned by Government. Arrangements are being made for the adaptation and translation of Thompstone's book.

(ii) The teaching of "the three R's" may be adapted in rural schools to the needs of rural life but should not be exclusively restricted thereto. This can best be done through the individual teacher (once he understands what is wanted) especially if he is exercised in such adaptation at his Training School or College. Separate syllabuses and a separate cadre of teachers are not essential. With the help of the Agricultural Department the Inspector of Training Schools might draw up a set of instructions for this purpose which should be useful not only for Training Institutions but for teachers after they have gone out into schools.

(iii) School gardens should be provided in places where land and water can be had without great cost, and provided that expert advice as regards laying out and maintenance can be made available. Rewards for useful and well kept gardens should be open for both teachers and pupils. The gardens should be cultivated with a view to producing grains, vegetables and fruits as well as flowers and specimens for nature study. Ceylon has an excellent system of school gardens and possibly a certain number of vernacular teachers and assistant Deputy Inspectors might be deputed to a course of study there. This experiment had been tried elsewhere.

(iv) Co-operation between the Agricultural and Educational Departments should be promoted, more particularly by the following measures:—

(a) Suitable officers of the Agricultural Department should visit Training Colleges and Classes and, after inspection, advise upon the instruction in nature study, school gardening and other subjects relating to rural life.

(b) The Agricultural Department should undertake a survey of the existing vernacular series of readers and make definite and detailed suggestions for their improvement in regard to the lessons dealing with nature study, object lessons; rural topics, etc., in order to render the books more suitable for rural pupils.

(c) Vernacular teachers and inspecting officers may be deputed to the Agricultural schools for purposes of study.

(d) Interchanges of teachers may take place between these schools and ordinary Local Board vernacular schools.

(e) Interchanges between the inspecting personnel of the two departments may also be tried.

(v) The personnel of the primary vernacular schools and of the inspecting agency that deals with them may be recruited as liberally as possible from the rural population always provided that suitable recruits are forthcoming and that selection is not confined to particular classes. It does not, however, seem possible to pledge the Department to any definite proportion.

(vi) Science or agricultural graduates may be welcomed on the inspection staff if they are competent to perform its necessary duties and are prepared to undergo necessary training in the Educational Department, which, if a man is to be a Deputy or Inspector, should include some experience in an Anglo-Vernacular School.

APPENDIX.

Resolution No. 10 passed at the Agricultural Educational Conference held at Simla on the 18th June 1917 and succeeding days.

The Conference accepts the principle that the text-books of primary schools be adapted to the rural environment of the pupil. They consider that, where necessary, the existing text-books should be revised by the Educational and Agricultural Departments in consultation, or that special text-books or syllabi should be prepared by them.

The Conference also strongly insists on the desirability of adapting primary education in rural areas more closely to rural needs. Whilst agreeing that no attempt should be made in primary schools to teach agriculture or horticulture as such, the following suggestions are made towards the solution of this problem:—

- (a) Nature Study should form a necessary part of the curriculum in rural schools.
- (b) All subjects—reading, writing and figuring—should be taught in relation to rural life.
- (c) A garden should be attached to each rural school as an aid to nature study, though lessons should also be given in the surrounding fields.
- (d) The teachers of rural schools should be recruited as far as possible from the rural population.
- (e) Special attention should be paid to the training of rural teachers, preferably in a separate training school for this purpose.
- (f) The Agricultural Department should, when opportunity offers, co-operate by vacation courses for such teachers.
- (g) The Educational Department should endeavour to recruit to the lower inspecting staff a larger proportion of the rural population.
- (h) The Educational Department should also endeavour to recruit as Inspectors or District Deputy Inspectors a larger proportion of science or agricultural graduates.

Discussion on Subjects Nos. 8 and 9.

The Hon'ble Dewan Bahadur Godbole said that he understood that many students from the Loni Agricultural School refused to take to farming and thought it below their dignity to work in the field. It was not proper that Government should give free board and lodging to such boys.

Rao Sáheb M. L. Kulkarni said that at the agricultural schools there were very few boys of the type mentioned by the Hon'ble Dewan Bahádúr Godbole. The great majority of the students from the agricultural schools, after completing their course, went back to work on their fields, and are working there now. He stated that the school at Devi Hosur was a great success, and they had just had to reject 38 applicants for want of room.

Mr. Otto Rothfeld said that he had seen some of the agricultural schools and he thought that at this stage the concession of free board and lodging was necessary if students were to be secured.

Mr. G. Keatinge agreed with the last speaker and said that the present aim of Government was to establish one such school per district. The total cost of this scheme would only be about Rs. 2 lakhs a year. When they were approaching the ideal of one such school a district, they would certainly have to consider the question of cost before launching out into fresh expenditure of this kind, but he thought that at present there was no need for alarm at the expenditure.

Ráo Bahádúr Ambashankar U. Malji thought that these agricultural schools should be handed over to the Táluka Local Boards who understood local needs and conditions.

Sardár P. K. Biwalkar thought that there was no doubt regarding the utility of these agricultural schools. They were very necessary, and there should be one in each táluka.

The Hon'ble Ráo Bahádúr S. D. Garud said that agriculture should be introduced as an optional subject at all primary schools. This will save Government the cost of maintaining agricultural schools and those boys who want agricultural education can have it.

The Hon'ble Dewan Bahádúr Godbole said that if you ask the boys in any village school what they intended to do, they would all say that they wanted to be clerks or something of the kind, and never that they wanted to return to their fields.

Mr. P. C. Patil agreed that this was so and said that what was necessary to find was some cure for this desire on the part of cultivators' sons to be clerks.

The Hon'ble Mr. B. S. Kamat suggested an agricultural school for each táluka.

Dr. Mann said that it was not that the Agricultural Department was unwilling to co-operate with the Educational Department but that the establishment of these separate agricultural schools seemed to be the only practical way to make a start in agricultural education. He thought, however, that the teaching in the ordinary primary school needed changing. If you asked cultivators why they did not keep their children at school beyond the 3rd standard, they would reply that if the children went further than the 3rd standard they would want to give up cultivation altogether.

The Hon'ble Mr. J. G. Covernton said that he did not think it possible to amalgamate general education and agricultural education. Under present conditions it was impossible to introduce agriculture as an optional subject in primary schools. It would mean introducing a lot of extra matter into the existing course. He referred to his printed note which gave his detailed opinions.

A resolution was then passed endorsing the suggestions made in paragraph 9 of the Director of Public Instruction's printed note.

Discussion on Subject No. 10.

"THE POSSIBILITY AND UTILITY OF ESTABLISHING DIVISIONAL BOARDS OF AGRICULTURE TO DISCUSS LOCAL PROBLEMS AND TO BE CONDUCTED IN THE VERNACULAR."

Brief Summary of the discussion.

Dr. Mann said that this proposal originally came from the Indian Board of Agriculture. The Government of India had referred the proposal to the Local Government, who had put the matter before this Board.

Mr. P. C. Patil was against the proposal. He thought it doubtful whether any advantage would arise from Divisional Boards. Even Provincial Boards were still on their trial.

Dr. Mann thought that Divisional Boards would be very useful. Real agriculturists would come to them. There are many men who wish to take part in the improvement of agriculture, but there is no opening for them. Provincial Boards would provide such an opening.

Rao Sahib M. L. Kulkarni endorsed the views of *Dr. Mann* and was in favour of Provincial Boards.

Mr. V. G. Gokhale opposed the idea and said that at present there was no opening for Divisional Boards.

Mr. K. B. Bhadrapur was in favour of Divisional Boards on a linguistic basis.

The Hon'ble Dewán Bahádur Godbole said that each district had its distinct problems and proposed District Agricultural Boards held in the vernacular. He also suggested sectional Boards, e.g., a Board on potatoes in the potato growing tract of the Poona District.

Dr. Mann said that the unit for which the Board was held did not much matter, the great thing was to find out the problems of cultivators, and he was inclined to agree to the idea of sectional Boards dealing with particular crops.

Mr. G. Keatinge agreed as to the necessity of finding out the difficulties of cultivators, but thought that this could best be done in their own villages. Holding a number of formal Boards would take up a lot of the time of the staff.

The Hon'ble Mr. G. S. Curtis said that in Northern India Divisions were only about half the size they were here. Proposals had been made for Divisional Boards, District Boards and Sectional Boards. He proposed to put all three proposals to the vote.

Voting took place as follows:—

	For	Against
(1) Divisional Boards	..	11
(2) District Boards	12	..
(3) Sectional Boards	7	12

The proposal to hold District Boards was declared to be carried.

Subject No. 11.

NOTE ON THE FUTURE ORGANISATION OF THE WORK OF THE AGRICULTURAL ENGINEER.

A proper survey of the work of the Department for the past 7 or 8 years will clearly show that the necessity for an elaborate establishment was never felt so keenly as now. The main functions of the Department are to test the different kinds of labour saving devices and agricultural implements, principally appearing on the market and to report on their suitability for agricultural purposes in India. Establishment proposals were therefore put up from time to time as the

demand for the various works in the Presidency arose and I have endeavoured to give as much attention as possible to this particular class of work. Consequently many suitable changes have been made.

The work of the Department has developed rapidly since the year 1915. The great rush of work owing to the war and famine totally changed the aspect of the Department. Nearly all experimental works therefore had to be stopped and all hands were required in the execution of new works. The applications from cultivators for ordinary tube wells and deep well bores began to pour in from all parts of the Presidency. In order to meet the increasing demand from the public additional boring machines were purchased and new men had to be trained for the work. Properly qualified men, however, not being available in time some of the cultivators were very disappointed as men and machines were not to be had for their works. Similarly new pumping plants and engines were purchased and erected at several places to relieve the famine conditions. Moreover, the Mesopotamia work brought additional heavy burden on the already insufficient staff which completely exhausted them. Several proposals have been sent at various times for additional staff but only a few posts have been sanctioned and the rest were not considered although there was a pressing need for them.

As a result of all this the members who were only few in numbers and much exhausted had hardly time to attend to the detailed accounts of works and cash expenditure which gave rise to some of the irregularities pointed out by the Accountant General, in his last inspection report.

In the interest of the work in the Presidency, stock is required to be kept at several places to meet the urgent demands of the work. The Accountant General has now pointed out the necessity of keeping detailed account of receipts and issues of the stores. The Government also desire that the plants and machines purchased for the Department should be given to the cultivator on hire and revenue thereof should be collected. The objects are no doubt very sound and can be easily achieved provided a sufficient number of clerks and executive subordinates are placed at the disposal of the Department. The Government were good enough to create an accountant's post for the accounts work of the office. But he has not been able to do any appreciable amount of work for want of clerical staff to assist him and also for want of executive staff for supplying him with the details of transactions regularly every month.

For a systematic work of the Department it is now quite essential to establish proper divisions in the Presidency under the control of each Divisional Officer, as suggested by the Accountant General. To facilitate prompt execution of work and also speedy inspection thereof six divisions in the Presidency are proposed for pumping, boring and steam ploughing Departments as per statement attached. A comparative statement of proposed and existing staff is included for ready reference.

The necessity for the proposed staff is explained in the following paragraphs:—

Establishment for the Agricultural Engineer's Office.

1. *Agricultural Engineer.*
2. *European Assistant.*—It is not possible for one officer to look after the affairs of the whole Presidency, and this difficulty has already been perceived by the Director, *vide* his remarks in the Administration Report, 1918-19. A separate report in this connection has already been made as per this office No. 8099, dated 30th December 1919.
3. *Native Assistant.*—This post is a sanctioned one and was created with the object of training a native of India for the post of Agricultural Engineer in other provinces in India and it will be in the interest of the Department to continue the post and his assistance will be of great value for the administrative work in future.
4. *Boring Overseer.*—The post was created as soon as the Department began to undertake boring work and this subordinate is overburdened as the applications for the boring work are pouring in continuously.

5. *Boring Inspector*.—This is a new post and it is proposed solely to give the necessary help to the Boring Overseer in the inspection of works so that he may utilise most of his time for the more important work in the Presidency.

6. *Assistant Mechanical Superintendents*.—One subordinate is proposed for attending to purely technical work in the office and to give general assistance to the Agricultural Engineer and his Assistants.

7. Instructor to the oil engine and boring class with one fitter.

8. One Accountant for the account work and general management of the office. He is also required to conduct the audit and inspection of the Divisional Offices as often as possible in the year. This post has already been sanctioned by the Government.

9. *One Deputy Accountant*.—Whenever the Accountant will be touring in the Presidency on inspection work, it is quite essential to have a responsible subordinate for the accounts work in the office. Such posts are already existing in Public Works Offices and Treasuries where large amount of cash transactions are taking place. This office is required to spend nearly a lakh and a half in a year and the post is quite essential.

10. *Head Clerk*.—The post is a sanctioned one and his work and responsibilities will increase greatly after the creation of divisions in the Presidency.

11. *Clerks*.—There are only four clerks sanctioned for the office and the present work in the office is being cleared by them with great difficulty and by the creation of Divisions the work in the office will enormously increase and the following clerical staff is proposed in the place of existing sanctioned strength.

(a) *Senior Clerks* :—

- 1 For salary bills.
- 1 For travelling allowance bills.
- 1 For audit of stores accounts.
- 1 Typist.
- 1 Record Clerk.
- 1 General Clerk.

(b) *Junior Clerks* :—

- 2 For audit of Divisional cash account.
- 1 For store account.
- 2 Copying clerks.
- 1 Inward clerk.
- 1 Despatch clerk.

12. *Draftsman*.—The post is already sanctioned.

13. *Assistant Draftsman*.—The present tracer's post is proposed to be converted into an Assistant Draftsman's post.

14. *Surveyor*.—There is no subordinate for making surveys of any new projects. The post is absolutely necessary and proposals for the same have already been made to the Director of Agriculture on several occasions.

15. *Menial Staff*.—One Naik, and four peons and one Khalashi already sanctioned are quite inadequate and the proposed establishment is required for the purposes mentioned below :—The existing has been included in figures shown below :—

- 1 Naik.
- 2 Peons for the personal use of the Agricultural Engineer.
- 1 For the European Assistant.
- 1 For the Native Assistant.
- 1 For the Boring Overseer.
- 2 For office use.
- 1 Khalashi for sweeping office and one Khalashi for Treasury work.
- 2 Tapalees for local delivery and 1 chowkidar.

Establishment for Store.

1. Assistant Mechanical Superintendent for the general management of stores including accounts work.
2. Two Assistant Store-keepers, one of them will attend to station duty and the other will look after the receipts and issues of materials in the store. Pay Rs. 60-4-100.
3. One Senior Clerk and one Junior Clerk for keeping account of stores as the transactions take place everyday. The existing Store Clerk will be converted into Senior Clerk.
4. One peon for office work and one Khalashi.
5. Two chowkidars for watching the stores day and night.

Establishment for Workshop.

1. *Assistant Mechanical Superintendent.*—The present post of Workshop Superintendent is proposed to be converted into an Assistant Mechanical Superintendent. The subordinate will solely be in charge of petty works going on in the workshops, and as he will have the advantage of referring to the office a junior post is proposed.
2. Two chargemen for instructing and taking work from the labourers both skilled and unskilled in the workshop and outside.
3. One senior clerk and one junior clerk for maintaining workshop account and preparing bills of costs of each work done in the workshop.
4. Three boring fitters to attend to the urgent repairs of boring machines.
5. One Boring Inspector and other staff as per statement.

Oil Engine and Boring Class.

One Instructor* to be in charge of the class for giving instructions to the students regarding the Oil engines and Boring machines. It is not possible for the department to get trained men unless such an institution is opened.

Divisions for Pumping and Boring Departments.

It is proposed to open six divisions in the Presidency for pumping, boring and other works under each Divisional Superintendent and Assistant Boring Overseers and the staff for each division will consist of the following men:—

1. One Superintendent for the proper control and management of work in the division.
2. One Assistant Boring Overseer to attend to boring work in that division.
3. Two Boring Inspectors to assist the Assistant Boring Overseers in supervising works.
4. Three fitters for carrying on repairs, etc., to the pumps and engines owned by the Government as well as by the agriculturists.
5. One senior clerk for accounts work, one junior clerk for stores and two junior clerks for correspondence work.
6. Three peons, 1 khalashi and 1 chowkidar for the office.

The existing places of Mechanical Superintendents, viz., Mechanical Superintendent, 1st grade, other Mechanical Superintendents, Pumping Overseer will be converted into the post of Divisional Superintendents in the proposed new scheme. There are already three Divisions of the Boring Department under each Assistant Boring Overseer. Owing to the increase of work it is proposed to create three more divisions.

Steam Plough Department.

There is already a sanction for one Steam Plough Overseer, one canvasser, six drivers, one fieldman, four oilmen, four ploughmen, one peon and one chowki-

*This is included in the office staff.

dar for carrying on Steam Plough operation. The only changes made in the new proposals are the designation of the Steam Plough Overseer is changed into the Assistant Mechanical Superintendent, one senior clerk and one junior clerk are proposed for the accounts and correspondence work and one more chowkidar is proposed to guard the tackle. The proposed new posts are quite essential for the accounts work as the accounts are to be kept in detail in future.

In addition to the above permanent posts some temporary posts are necessary and they are required to be engaged according to current demands. These men will be engaged by charge to contingencies and their cost will be subsequently charged against the works for which their services will be utilised. Therefore a formal sanction to the entertainment of the posts will be quite sufficient.

		Rs.
Fitters	on pay from	.. 40 to 60
Drivers	do. ..	.. 40 ,, 60
Carpenters	do. ..	.. 40 ,, 60
Masons	do. ..	.. 40 ,, 60
Smiths and Moulders	do. ..	.. 40 ,, 60
Turners	do. ..	.. 40 ,, 60
Mechanists	do. ..	.. 30 ,, 50
Boring Mucadams	do. ..	.. 30 ,, 70
Trained coolies	do. ..	.. 20 ,, 30
Hammermen and Blower boys	do. ..	.. 15 ,, 20

Reasons for the proposed Increase in Salary.

In the whole of the Presidency there is a general cry about the insufficiency of pay of Government servants and proposals for the revision for the scale of pay are being put forth for the orders of Government by all departments. Keeping in view the proposals drafted by several departments the following proposals are made for this Department:—

1. Agricultural Engineer. } These two places being of Imperial line to be
2. European Assistant. } dealt with separately.

Pay Rs. 500-50-1,000, based on Imperial Grade of Assistant Engineer in Public Works Department.

3. *Native Assistant to the Agricultural Engineer.*—This post was originally created on Rs. 150-10-200, by Government in Government Resolution, Revenue Department, No. 8797 of 24th September 1912, with a view to train a Native of India for the Agricultural Engineer's post. Mr. Paranjpe was accordingly appointed to the post and he has completed five years' probationary period some two years back and is now quite able to take charge of the Agricultural Engineer's post of any province.

He is for the present working as Personal Assistant and carrying on all the duties of the Agricultural Engineer. He was recommended to act as Agricultural Engineer during the last vacancy by the Director of Agriculture and also by myself. Mr. Thiselton-Dyer was nominally appointed to take charge of the office and Mr. Paranjpe had to run the whole work of the Department for which Government was pleased to sanction duty allowance of Rs. 75 per mensem for the period. It is therefore proposed to increase his pay to Rs. 350-35-700 as he has enormous work to do and also the cost of living has greatly increased during the recent years. The suggested grade is based on the salary of the Assistant Engineer, Public Works Department, on Provincial Grade which is Rs. 300-40-860.

4. *Boring Overseer.*—This subordinate is in charge of boring works going on in the Presidency including Sind and he has managed the work very skilfully up to this time. In consideration of work and high cost of living it is proposed to increase his pay to Rs. 200-20-500. The grade suggested is based on the pay of the upper subordinate first grade in Public Works Department which is Rs. 400, now capable of being increased by the new revision.

It will be in the interest of the Department if the above two posts are gazetted as these subordinates are required to repeatedly come in contact with District Officers and therefore it is quite essential to increase their local status in proportion to their pay.

5. *Divisional Superintendents.*—Pumping and Steam Plough Departments. In the proposed new scheme the Superintendent will have more responsibility and work to do than at present. It is therefore proposed to create these posts on Rs. 160-15-340 and the proposed pay is on the lines of the divisional superintendents in the proper Agricultural Department or 2nd grade upper subordinates in Public Works Department according to old scales. The pay of the Engineers in Private Mills is for the present nearly on the same lines, certainly not less.

Mr. Vaidya, Mechanical Superintendent, 1st grade, is a most senior man in the Department and to maintain his rank and seniority in the Department it is proposed to give him the benefit of three years' increment at once, in the new scheme so that his pay may amount to Rs. 205. He has worked very satisfactorily in the Department and he is well deserving of the proposed concession. If this is not allowable by rules I have to strongly recommend a special post of Rs. 205-15-340 as a Senior Divisional Superintendent.

6. *Assistant Mechanical Superintendents.*—These subordinates will have to do nearly all the work done by the Superintendents, but they will have not as much responsibility as these men will be junior subordinates, their pay is proposed on Rs. 100-10-150 which seems quite reasonable.

7. *Assistant Boring Overseers.*—As the work of these subordinates does not require high technical knowledge as the Mechanical Superintendents, it is proposed to have a different scale for these subordinates and their pay is proposed on Rs. 100-8-180. As compared to their work the pay is not much.

8. *Boring Inspectors.*—These places are similar to the Assistant Mechanical Superintendents but require less knowledge of Mechanical Engineering, therefore the post of Rs. 75-5-100 is proposed in the new scheme.

8a. *Instructors to the Oil engine and Boring Class,* pay Rs. 100-8-180.

9. *Fitters, Drivers, Boring Fitters.*—As the cost of living has greatly increased and also as there is great demand for these men everywhere it is very difficult to get good men on present scale of pay. Therefore it is proposed to increase their salary from Rs. 40-3-70 to Rs. 70-3-100 according to qualifications.

10. *Chargemen.*—In the new scheme it is proposed to engage two chargemen to give instruction to the skilled and unskilled labourer and to exact proper work from them. Their pay will be Rs. 60-4-100 as only men of long experience of work will be appointed for these posts. One will be posted at the Shops and other outside on erection work.

11. *Surveyor.*—It is proposed to engage a surveyor of the qualifications of sub-overseer in the Public Works Department and his pay will be Rs. 70-5-120.

12. *Canvasser Fieldmen.*—These posts are already sanctioned in connection with the steam plough operation. Owing to the present high cost of living it is necessary to increase their pay to Rs. 70-5-120.

13. *Draftsman.*—The place is already a sanctioned one and his pay is required to be proportionately increased to suit the scale of subordinates. His increment is therefore proposed for Rs. 90-5-130.

14. *Assistant Draftsman.*—This post is asked for in place of the existing tracer's post and the pay proposed is Rs. 60-3-90.

15. *Oilmien.*—These posts are already sanctioned and proposal of Rs. 15-2-35 is made on account of present high cost of living.

16. *Ploughmen.*—Increase of Rs. 20-2-40 for reasons stated above.

OFFICE ESTABLISHMENT.

1. *Accountant.*—In this office the Accountant is required to do the same work as the Accountants in the Public Works Department. The Public Works

Department Accountants have sent in Memorials to Government for increasing their pay to Rs. 200—20—400. The Accountant in this office, in addition to looking after the accounts work of the office, is required to inspect the divisional offices from time to time and it is proposed to give him a duty allowance of Rs. 50 in addition to the above pay.

2. *Head Clerk.*—The work of the Head Clerk will increase enormously after establishment of proper divisions in the Presidency. It is therefore proposed Rs. 150—5—200 for him as this will be in proportion to the additional work and also high cost of living.

3. *Deputy Accountant.*—A senior accounts knowing man will be necessary for the post and he will have to look after the accounts work when the Accountant goes on inspection duty. Therefore his pay is proposed for Rs. 125-5-150 which is quite reasonable as compared to responsibility.

4. *Senior Clerks.*—Persons of long experience of work in the Department should be appointed for the posts and hence their pay is proposed for Rs. 70—5—120 as these men will have to do more responsible work in the office.

5. *Junior Clerks.*—It has become very difficult to get men on existing starting pay in the Department as they cannot pull on with such small pay. Keeping in view their difficulty for living a scale of Rs. 40—3—70 is proposed.

Menial Establishment.

	Rs.	
Náik ..	18-1-25	It is very difficult for the low-paid menials staff to pull on within 8 or 9 rupees every month. A proportionate increase in their pay is also necessary and the rates proposed are reasonable if the cost of present living is taken into consideration.
Peons ..	15-1-20	
Chowkidárs ..	15-1-20	
Khalashi ..	12-1-15	
Tapali ..	12-1-15	

W. M. SCHUTTE,
Agricultural Engineer, B. P., Poona.

SCHEME No. 1

Serial No.	Grade.	
1	Agricultural Engineer.	1
2	European Assistant 500—50—1,000.	1
3	Indian Assistant 350—35—700.	1
4	Boring Overseer 200—20—500.	1
5	Divisional Mechanical Superintendents 100—15—345.	1
6	Assistant Mechanical Superintendents 100—10—150.	1
7	Assistant Boring Overseer 100—8—180.	1
8	Boring Inspector 75—5—100.	1
9	Instructor to Oil Engine and Boring Class 100—5—180.	1
10	Assistant Store-keeper 60—4—100.	2
11	Workshop Chargeman 60—4—100.	2
12	Fitters, Junior and Drivers 40—3—70.	13
13	Draftsman 60—5—130.	13
14	Assistant Draftsman 60—3—90.	13
15	Surveyor 75—5—120.	1
16	Canvasser 70—5—120.	2
17	Accountant 200—20—400.	1
18	Head Clerk 150—5—200.	1
19	Deputy Accountant 125—5—150.	1
20	Senior Clerk and Typist 70—5—120.	1
21		1
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100		1

Temporary Establishment (Kor-pendaksho)

Serial No.	Grade.	
1	Agricultural Engineer's Office	7
2	Agricultural Store	1
3	Do. Workshops	1
4	Oil Engine and Boring Class	1
5	Steam Brough	1
6	Division No. I	3
7	Do. No. II	3
8	Do. No. III	3
9	Do. No. IV	3
10	Do. No. V	3
11	Do. No. VI	3
12	Proposed strength.	29
13	Present strength.	1
14	Increases	20
15	Junior Clerks—40—2—70.	7
16	Nak 18—1—25.	1
17	Peons 15—1—20.	7
18	Chowkidars 15—1—20.	1
19	Khalashias 12—1—15.	1
20	Tapalies 12—1—15.	2
21	Oilmen 15—2—35.	2
22	Ploughmen 20—2—40.	2
23	Fitters Senior 70—3—100.	3
24	Turners 40 to 60.	3
25	Smiths 40 to 60.	4
26	Carpenters 40 to 60.	3
27	Masons 40 to 60.	4
28	Moulder 40 to 60.	1
29	Hammer-man 20 to 30.	4
30	Blower boys 15 to 20.	3
31	Boring Mechanics or Boreers 30 to 70.	3
32	Trained apprentices 20 to 30.	6
33	Fitters 40 to 60.	4
34	Coolies 18 to 25.	10
35	Mechanists 30 to 50.	4
36		2
37		2
38		2
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Discussion on Subject No. 11.

Mr. Schutte stated that he had submitted a printed note on this subject. He must have an increase of staff if his work was to expand and be of general use to cultivators. Scheme No. 1 showed his maximum requirements during the next few years, while another scheme which he had submitted showed his immediate and minimum requirements for staff, which covered seven new posts and some subordinate staff. The seven posts were, a European Assistant Engineer, an instructor for the oil engine and boring classes, a surveyor, store-keeper, canvasser and two senior clerks. For this scheme he estimated the total cost to be about Rs. 1,686 per mensem. He gave figures showing how enormously his work had expanded and how large was the demand made by the public for advice and assistance. Scheme No. 1 provided for expansion all round. He proposed to set up a small Engineering Department in each division, equipped with tools and materials. A Divisional Superintendent would be in charge of each Depot with the necessary technical staff of boring Inspectors, fitters, etc., and work would be disposed of direct from these Depôts and all the work would not come to Poona as at present. This would save a great congestion of work at Poona. In 1918-19 he spent Rs. 3,66,000 with only one accountant on Rs. 40 per mensem to do his accounts, and he now had stores on hand worth Rs. 5 lakhs, with only a store-keeper on Rs. 20 per mensem to look after them. He had hoped that the District Local Boards would relieve him of some of his work. Several of them had taken up boring, but they were unable to carry it on successfully. He thought that his branch had a good record of work done, but it had come to this that it must be either more staff or less work.

The Honourable Dewán Bahádúr Godbole said that it was a question whether some of the work now done by the Agricultural Engineer could not be undertaken by private agency. Repairs to machinery, etc., were done by the Agricultural Engineer, both for departmental machinery and for machinery belonging to private persons. He suggested that private agencies might be induced to open workshops at places like Poona, Hubli, Ahmedabad, Nadiád or Karáchi, which would relieve the Agricultural Engineer of all this work. An initial subsidy from Government to such firms might be necessary in the beginning.

The Honourable Mr. B. S. Kamat said that he noted that the Agricultural Engineer was asking for a European Assistant and for an Indian Assistant. He asked whether two Indian Assistants would not do as well and save outlay.

Mr. Schutte replied that if relieved of this executive work his present staff was ample, but if he was to expand his executive work, viz., deep ploughing, boring operations, and the erection of pumping plants he considered that a European Assistant was essential. In reply to the Honourable Dewán Bahádúr Godbole he said that he would be very glad if private firms would take over his executive work entirely, leaving him to do experimental and advisory work, but he did not think that he could be responsible for extensive executive work in the field if all his repair work was to be done for him by the suggested agencies, and he was to have no workshop.

Ráo Sáheb Dadubhai Desai thought that a great extension of the work of the Agricultural Engineer was desirable, and would like to see a separate Agricultural Engineer for each charge now held by a Deputy Director, with a Chief Agricultural Engineer at Poona to supervise them.

Mr. Thisekton-Dyer thought that the work of the Agricultural Engineer wanted careful overhauling. The Agricultural Engineer had large numbers of men on low pay working in many parts of the Presidency under very little supervision and he did not think that this was suitable. He thought that the scope and limits of the work wanted to be clearly defined and suggested that a suitable committee be called for the purpose.

Mr. G. Keatinge said that if private agency could be found to do work now done by the Agricultural Engineer, it would be a very good thing, but could any one say where such agency was to be found. It must be remembered that it was found necessary in the beginning to have an Agricultural Engineer to advise and

assist the public in Agricultural Machinery, because it was found that some firms were giving such bad advice to the public on these subjects.

The Honourable Dewán Bahádur Godbole said that he believed that suitable firms could be found to do some of the work.

The Honourable Mr. G. S. Curtis said that there were various opinions on the subject and he thought that the matter needed discussion by special Committee, as had been suggested.

Subject No. 12.

NOTE ON COTTON SALE SOCIETIES.

These societies have not been started with a view to encouraging co-operation. They have been started to help the Agricultural Department in its task of satisfying the international capitalist market by giving them a purer Indian cotton. It is, however, also a secondary object to try, if possible, to secure for the cultivator, by co-operative combination, a fairer share of the prices allowed by the international market, that is to say, the price with a smaller deduction for the local middleman's profit.

2. The main object cannot be realized unless (a) a pure strain is maintained, and (b) adulteration is avoided. Neither of these conditions, however, can possibly be attained unless the big buyers are prepared (1) to take some trouble to secure pure and unadulterated cotton and (2) to pay a proportionately higher price for it. The facts, however, are that the big buyers refuse to take any trouble at all and that they do not pay a commensurately higher price. They content themselves with writing letters to the papers and so on. Their real idea is that other people—Government by preference—should take the trouble on their behalf and that the cultivator should produce better cotton for them at the same price that they pay for worse, thereby increasing their profits but leaving the cultivator actually worse off. However, for various reasons, Government and the Agricultural Department, are apparently committed to helping the cotton merchants, so one can only note the fact that the latter do not help themselves.

3. It is believed that the Cotton Sale Societies have done a good deal to secure the conditions noted above. To a slight extent they have also increased cultivators' profits at the expense of the middlemen and to a very slight extent indeed—if at all—by getting a little better price for higher varieties. They have done nothing to increase the co-operative spirit. It is indeed a question whether they have not harmed it by inducing dependence on experts and on a small Committee or a Chairman, usually consisting of renegade middlemen.

4. A principle of compulsion has been introduced which is quite wrong and harmful. Neighbouring Credit Societies have been induced to force borrowing members to sell their cotton through the Cotton Sale Society as a condition to getting loans. This ruins the co-operative spirit, destroys the Credit Society and only serves to prop up a Cotton Sale Society whatever its faults may be, instead of compelling it to succeed by manifesting its advantages to members. The system must be stopped. Four Cotton Sale Societies have actually gone further and are at great risk to themselves lending money to Societies on similar conditions. It is hardly conceivable that this was ever allowed but it does actually go on.

5. An absurdity arising from the unco-operative nature of these Societies is that although their turn-over is 2 or 3 lakhs each, they yet ask for all sorts of exemptions and favours from Government. For instance, some have suggested that they should escape altered assessment of a few rupees; another actually had the impudence to ask the Registrar to secure the grant or loan of a couple of thousand from Government for a building, though the members could have raised this by the deduction of a minute fraction of an anna per rupee on the prices realized. In no single Society have members made any attempt to bank any part of their large profits so as to avoid the necessity of advances in the next year.

6. These unco-operative practices will have to be stopped in the interests of the movement, unless cause is shown for winking at them for another year in the interests of the large cotton buyers. But in that case the buyers should be asked to state definitely whether they want these societies and will promise to buy from them direct.

7. Minor improvements required are, (1) study of the Barar system, (2) weigh bridges, (3) training of managers. Special facilities in the way of remission of assessments, etc., are not required.

OTTO ROTHFELD,
Registrar,
Co-operative Societies.

Discussion on Subject No. 12.

Mr. Otto Rothfeld said he had had an opportunity of discussing the subject that morning with the Honourable Mr. Purshotamdas Thakurdas, and wished to modify some of his statements in his Note. He recognized that, there were some large merchants and buyers who did sympathise with the cultivators and their difficulties in selling cotton. He would, however, like to invite the attention of the Board to paragraph 4 of his Note, and to ask their opinion on the matter.

The Honourable Mr. G. S. Curtis.—It is purely a Co-operative question and not an Agricultural one.

The Honourable Mr. Purshotamdas Thakurdas expressed the opinion that paragraphs 1 and 2 of Mr. Rothfeld's Note contained an entirely wrong view about the attitude of the cotton trade. He reviewed the circumstances of the Cotton Frauds Act of 1880, and said that the agitation then was made with the object of getting pure cotton on the market. The present movement against indiscriminate cotton mixing is in the interest of the cultivators who must lose heavily by the practice and are now losing heavily. He said that in a popular movement they must expect such demands as those referred to in paragraph 5 of the Note. Referring to paragraph 6 of the Note he said that the matter was not one for the buyers at all. They cannot bind themselves to buy from any particular society.

Rao Sahab M. L. Kulkarni said that he agreed with paragraphs 1 and 2 of Mr. Rothfeld's Note. Buyers of cotton sympathised little with the growers of cotton. They will not pay for long-stapled cotton. If they are ready to guarantee a premium for long-stapled cotton, it will be grown. If not, it may easily die out altogether.

The Honourable Mr. Curtis said that he did not think that any Resolution on this subject was possible, and declared the Board meeting to be at an end.