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ROYAL COMMISSION

ON

AGRICULTURE IN INDIA

Volume IX

EVIDENCE

TAKEN IN THE

North-West Frontier Province



CALCUTTA: GOVERNMENT OF INDIA
CENTRAL PUBLICATION BRANCH
1927

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INTERIM REPORT.

To

THE KING'S MOST EXCELLENT MAJESTY.

May It Please Your Majesty,

We, the Commissioners appointed to examine and report on the present conditions of agricultural and rural economy in British India, and to make recommendations for the improvement of agriculture and to promote the welfare and prosperity of the rural population; in particular, to investigate:—(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock; (*b*) the existing methods of transport and marketing of agricultural produce and stock; (*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists; (*d*) the main factors affecting rural prosperity and the welfare of the agricultural population; and to make recommendations; availing ourselves of Your Majesty's permission to report our proceedings from time to time, desire to submit to Your Majesty the minutes of the evidence which we have taken in respect of the North West Frontier Province on the subject of our Inquiry.

All of which we most humbly submit for Your Majesty's most gracious consideration.

(Signed) LINLITHGOW,
Chairman.
(,,) H. S. LAWRENCE.
(,,) T. H. MIDDLETON.
(,,) J. MacKENNA.
(,,) H. CALVERT.
(,,) N. GANGULEE.
(,,) L. K. HYDER.
(,,) B. S. KAMAT.

(Signed) J. A. MADAN,
(,,) F. W. H. SMITH,
Joint Secretaries.

25th July, 1927.

(62427)

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TERMS OF REFERENCE

Generally,

To examine and report on the present conditions of agriculture and rural economy in British India and to make recommendations for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population ;

In particular to investigate—

(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock ;

(*b*) the existing methods of transport and marketing of agricultural produce and stock ;

(*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists ;

(*d*) the main factors affecting rural prosperity and the welfare of the agricultural population ;

and to make recommendations.

It will not be within the scope of the Commission's duties to make recommendations regarding the existing system of landownership and tenancy or of the assessment of land revenue and irrigation charges, or the existing division of functions between the Government of India and the local Governments. But the Commission shall be at liberty to suggest means whereby the activities of the Governments in India may best be co-ordinated and to indicate directions in which the Government of India may usefully supplement the activities of local Governments.

QUESTIONNAIRE

Part I

Question.

1. Research.
2. Agricultural education.
3. Demonstration and propaganda.
4. Administration.
5. Finance.
6. Agricultural indebtedness.
7. Fragmentation of holdings.

Part II

8. Irrigation.
9. Soils.
10. Fertilisers.
11. Crops.
12. Cultivation.
13. Crop protection.
14. Implements.

Part III

15. Veterinary.
16. Animal husbandry.

Part IV

17. Agricultural industries.
18. Agricultural labour.
19. Forests.
20. Marketing.
21. Tariffs and sea freights.
22. Co-operation.
23. General education.
24. Attracting capital.
25. Welfare of rural population.
26. Statistics.

QUESTIONNAIRE

PART I

1. Research.

(*a*) Have you suggestions to advance for the better organisation, administration and financing of—

(*i*) All research affecting the welfare of the agriculturist, including research into the scientific value of the indigenous theory and traditional methods of agriculture,

(*ii*) Veterinary research ?

(*b*) If in cases known to you progress is not being made because of the want of skilled workers, or field or laboratory facilities for study or by reason of any other handicaps, please give particulars. [Suggestions of a general kind should be made under (*a*) ; answers under this heading should relate to specific subjects. The purpose is to secure a list of the problems met with by scientific investigators in the course of their work which are being held over because of lack of resources or deficient organisation.]

(*c*) Can you suggest any particular subject for research not at present being investigated to which attention might usefully be turned ?

2. Agricultural Education.

With reference to any form of agricultural education of which you may have experience, please state your views on the following :—

(*i*) Is the supply of teachers and institutions sufficient ?

(*ii*) Is there an urgent need for extension of teaching facilities in any district or districts known to you personally ?

(*iii*) Should teachers in rural areas be drawn from the agricultural classes ?

(*iv*) Are the attendances at existing institutions as numerous as you would expect in present circumstances ; if not, state reasons. Can you suggest measures likely to stimulate the demand for instruction ?

(*v*) What are the main incentives which induce lads to study agriculture ?

(*vi*) Are pupils mainly drawn from the agricultural classes ?

(*vii*) Are there any modifications in existing courses of study which appear to be called for ; if so, what are they ?

(*viii*) What are your views upon (*a*) nature study ; (*b*) school plots ; (*c*) school farms ?

(*ix*) What are the careers of the majority of students who have studied agriculture ?

(*x*) How can agriculture be made attractive to middle class youths ?

(*xi*) Are there recent movements for improving the technical knowledge of students who have studied agriculture ?

(*xii*) How can adult education in rural tracts be popularised ?

(*xiii*) In suggesting any scheme for better educational facilities in rural areas, please give your views for (*a*) its administration and (*b*) its finance.

3. Demonstration and Propaganda.

(*a*) What are the measures which in your view have been successful in influencing and improving the practice of cultivators ?

(*b*) Can you make suggestions for increasing the effectiveness of field demonstrations ?

(*c*) Can you suggest methods whereby cultivators may be induced to adopt expert advice ?

(*d*) If you are aware of any striking instances of the success or the failure of demonstration and propaganda work, please give particulars and indicate the reasons for success or for failure.

4. Administration.

(*a*) Do you wish to suggest means towards the better co-ordination of the activities of the Governments in India or to indicate directions in which the Government of India may usefully supplement the activities of the local Governments ?

(*b*) Is it your opinion that the expert scientific knowledge required in the development of agriculture in the different Provinces could be supplied to a greater extent than is the case at present by increasing the scientific staff of the Government of India ? If so, indicate the types of work which would benefit by pooling the services of experts, and suggest how that work should be controlled.

(*c*) Are you satisfied from the agricultural standpoint with the services afforded by—

(*i*) The Agricultural and Veterinary Services,

(*ii*) Railways and steamers,

(*iii*) Roads,

(*iv*) Meteorological Department,

(*v*) Posts, and

(*vi*) Telegraphs, including wireless ?

If not, please indicate directions in which you think these Services might be improved or extended.

5. Finance.

(*a*) What are your views as to the steps that should be taken for the better financing of agricultural operations and for the provision of short and long-term credit to cultivators ?

(*b*) Do you wish to suggest means whereby cultivators may be induced to make fuller use of the Government system of *taccavi* ?

6. Agricultural Indebtedness.

(*a*) What in your opinion are :—

(*i*) the main causes of borrowing,

(*ii*) the sources of credit, and

(*iii*) the reasons preventing repayment.

(*b*) What measures in your opinion are necessary for lightening agriculture's burden of debt ? For example, should special measures be taken to deal with rural insolvency, to enforce the application of the Usurious Loans Act, or to facilitate the redemption of mortgages ?

(*c*) Should measures be taken to restrict or control the credit of cultivators such as limiting the right of mortgage and sale ? Should non-terminable mortgages be prohibited ?

7. Fragmentation of Holdings.

(*a*) Do you wish to suggest means for reducing the loss in agricultural efficiency attendant upon the excessive subdivision of holdings ?

(*b*) What are the obstacles in the way of consolidation and how can they be overcome ?

(*c*) Do you consider legislation to be necessary to deal with minors, widows with life interest, persons legally incapable, alienation and dissentients, and to keep disputes out of the courts ?

PART II

8. Irrigation.

(*a*) Name any district or districts in which you advocate the adoption of new irrigation schemes, or suggest extensions or improvements in the existing systems or methods of irrigation by—

(*i*) Perennial and non-perennial canals,
(*ii*) Tanks and ponds,
(*iii*) Wells.

What are the obstacles in your district or Province to the extension of irrigation by each of the above methods ?

(*b*) Are you satisfied with the existing methods of distributing canal water to cultivators ? Describe the methods that have been employed to prevent wastage of water by evaporation and by absorption in the soil. What form of outlet for distribution to cultivators at the tail end do you regard as the most equitable and economical ? Have these methods and devices been successful, or do you wish to suggest improvements ?

(*N.B.*—Irrigation charges are *not* within the terms of reference of the Commission, and should not be commented upon.)

9. Soils.

(*a*) Have you suggestions to make—

(*i*) for the improvement of soils, whether by drainage or other means, not dealt with under other headings in this questionnaire.
(*ii*) for the reclamation of Alkali (Usar) or other uncultivable land,
(*iii*) for the prevention of the erosion of the surface soil by flood water ?

(*b*) Can you give instances of soils known to you which, within your recollection, have—

(*i*) undergone marked improvement,
(*ii*) suffered marked deterioration ?

If so, please give full particulars.

(*c*) What measures should Government take to encourage the reclamation of areas of cultivable land which have gone out of cultivation ?

10. Fertilisers.

(*a*) In your opinion, could greater use be profitably made of natural manures or artificial fertilisers ? If so, please indicate the directions in which you think improvement possible.

(*b*) Can you suggest measures to prevent the fraudulent adulteration of fertilisers ?

(*c*) What methods would you employ to popularise new and improved fertilisers ?

(*d*) Mention any localities known to you in which a considerable increase in the use of manures has recently taken place.

(*e*) Has effect of manuring with phosphates, nitrates, sulphate of ammonia, and potash manures been sufficiently investigated ? If so, what is the result of such investigation ?

(*f*) What methods would you employ to discourage the practice of using cowdung as fuel ?

11. Crops.

(*a*) Please give your views on—

(*i*) the improvement of existing crops,

(*ii*) the introduction of new crops including fodder crops,

(*iii*) the distribution of seeds,

(*iv*) the prevention of damage by wild animals.

(*b*) Can you suggest any heavy yielding food crops in replacement of the present crops ?

(*c*) Any successful efforts in improving crops or substituting more profitable crops which have come under your own observation should be mentioned.

12. Cultivation.

Can you suggest improvements in—

(*i*) the existing system of tillage, or

(*ii*) the customary rotations or mixtures of the more important crops ?

13. Crop Protection, Internal and External.

Please give your views on—

(*i*) The efficacy and sufficiency of existing measures for protection of crops from external infection, pests and diseases.

(*ii*) The desirability of adopting internal measures against infection.

14. Implements.

(*a*) Have you any suggestion for the improvement of existing, or the introduction of new, agricultural implements and machinery ?

(*b*) What steps do you think may usefully be taken to hasten the adoption by the cultivator of improved implements ?

(*c*) Are there any difficulties which manufacturers have to contend with in the production of agricultural implements or their distribution for sale throughout the country ? If so, can you suggest means by which these difficulties may be removed ?

PART III

15. Veterinary.

(*a*) Should the Civil Veterinary Department be under the Director of Agriculture or should it be independent ?

(*b*) (*i*) Are dispensaries under the control of Local (District) Boards ? Does this system work well ?

(*ii*) Is the need for expansion being adequately met ?

(*iii*) Would you advocate the transfer of control to Provincial authority ?

(*c*) (*i*) Do agriculturists make full use of the veterinary dispensaries ? If not, can you suggest improvements to remedy this ?

(*ii*) Is full use made of touring dispensaries ?

(*d*) What are the obstacles met with in dealing with contagious diseases ? Do you advocate legislation dealing with notification, segregation, disposal of diseased carcases, compulsory inoculation of contacts and prohibition of the movement of animals exposed to infection ? Failing legislation, can you suggest other means of improving existing conditions ?

(*e*) Is there any difficulty in securing sufficient serum to meet the demand ?

(*f*) What are the obstacles in the way of popularising preventive inoculation ? Is any fee charged, and, if so, does this act as a deterrent ?

(*g*) Do you consider that the provision of further facilities for research into animal disease is desirable ?

If so, do you advocate that such further facilities should take the form of—

(*i*) an extension of the Muktesar Institute, or

(*ii*) the setting up, or extension of, Provincial Veterinary Research Institutions ?

(*h*) Do you recommend that special investigations should be conducted by—

(*i*) officers of the Muktesar Institute, or

(*ii*) research officers in the Provinces ?

(*i*) Do you recommend the appointment of a Superior Veterinary Officer with the Government of India ? What advantages do you expect would result from such an appointment ?

16. Animal Husbandry.

(*a*) Do you wish to make suggestions for—

(*i*) improving the breeds of livestock,

(*ii*) the betterment of the dairying industry,

(*iii*) improving existing practice in animal husbandry ?

(*b*) Comment on the following as causes of injury to cattle in your district—

(*i*) Overstocking of common pastures,

(*ii*) Absence of enclosed pastures, such as grass borders in tilled fields,

(*iii*) Insufficiency of dry fodder such as the straw of cereals or the stems and leaves of pulses,

(*iv*) Absence of green fodders in dry seasons,

(*v*) Absence of mineral constituents in fodder and feeding stuffs.

(*c*) Please mention the months of the year in which fodder shortage is most marked in your district. For how many weeks does scarcity of fodder usually exist ? After this period of scarcity ends how many weeks elapse before young growing cattle begin to thrive ?

(*d*) Can you suggest any practicable methods of improving or supplementing the fodder supply that would be applicable to your district ?

(*e*) How can landowners be induced to take a keener practical interest in these matters ?

PART IV

17. Agricultural Industries.

(*a*) Can you give any estimate of the number of days of work done by an average cultivator on his holding during the year ? What does he do in the slack season ?

(*b*) Can you suggest means for encouraging the adoption of subsidiary industries ? Can you suggest any new subsidiary industries to occupy the spare time of the family which could be established with Government aid ?

(*c*) What are the obstacles in the way of expansion of such industries as beekeeping, poultry rearing, fruit growing, sericulture, pisciculture, lac culture, rope making, basket making, etc. ?

(*d*) Do you think that Government should do more to establish industries connected with the preparation of agricultural produce for consumption, such as oil pressing, sugar making, cotton ginning, rice hulling, utilisation of wheat straw for card-board, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc. ?

(*e*) Could subsidiary employment be found by encouraging industrial concerns to move to rural areas ? Can you suggest methods ?

(*f*) Do you recommend a more intensive study of each rural industry in its technical, commercial and financial aspects, with a view to, among other things, introduction of improved tools and appliances ?

(*g*) Can you suggest any other measures which might lead to greater rural employment ?

(*h*) Can you suggest means whereby the people could be induced to devote their spare time to improving the health conditions of their own environment ?

18. Agricultural Labour.

(*a*) What measures, if any, should be taken to attract agricultural labour from areas in which there is a surplus to—

(*i*) areas under cultivation in which there is a shortage of such labour ? and

(*ii*) areas in which large tracts of cultivable land remain uncultivated ?

Please distinguish between suggestions designed to relieve seasonal unemployment and proposals for the permanent migration of agricultural population.

(*b*) If there is any shortage of agricultural labour in your Province, what are the causes thereof and how could they be removed ?

(*c*) Can you suggest measures designed to facilitate the occupation and development, by surplus agricultural labour, of areas not at present under cultivation ?

19. Forests.

(*a*) Do you consider that forest lands as such are at present being put to their fullest use for agricultural purposes ? For instance, are grazing facilities granted to the extent compatible with the proper preservation of forest areas ? If not, state the changes or developments in current practice which you consider advisable.

(*b*) Can you suggest means whereby the supply of firewood and fodder in rural areas may be increased ?

(*c*) Has deterioration of forests led to soil erosion ? What remedies would you suggest for erosion and damage from floods ?

(*d*) Can you indicate any methods by which supply of moisture in the soil, the rainfall and supply of canal water can be increased and regulated by afforestation or by the increased protection of forests so as to benefit agriculture ? Would the same methods be useful in preventing the destruction by erosion of agricultural land ?

(*e*) Is there an opening for schemes of afforestation in the neighbourhood of villages ?

(*f*) Are forests suffering deterioration from excessive grazing ? Is soil erosion being thereby facilitated ? Suggest remedies.

20. Marketing.

(*a*) Do you consider existing market facilities to be satisfactory ? Please specify and criticise the markets to which you refer, and make suggestions for their improvement.

(*b*) Are you satisfied with the existing system of marketing and distribution ? If not, please indicate the produce to which you refer and describe and criticise in detail the channels of marketing and distribution from the producer to the consumer in India (or exporter in the case of produce exported overseas). State the services rendered by each intermediary and whether such intermediary acts in the capacity of merchant or commission agent, and comment upon the efficiency of these services and the margins upon which such intermediaries operate. Please describe

the method by which each transaction is financed, or in the case of barter, by which an exchange is effected.

(*c*) Do you wish to suggest steps whereby the quality, purity, grading or packing of agricultural produce may be improved, distinguishing where possible between produce destined for—

(*i*) Indian markets ?

(*ii*) Export markets ?

(*d*) Do you think that more effective steps might be taken to place at the disposal of cultivators, merchants and traders information as to market conditions, whether Indian or overseas ; crop returns ; complaints as to Indian produce from wheresoever originating ; and agricultural and marketing news in general ?

21. Tariffs and Sea Freights.

Do existing (*a*) customs duties, both import and export, and (*b*) sea freights adversely affect the prosperity of the Indian cultivator ? If so, have you any recommendations to make ?

22. Co-operation.

(*a*) What steps do you think should be taken to encourage the growth of the co-operative movement—

(*i*) by Government,

(*ii*) by non-official agencies ?

(*b*) Have you any observations to make upon—

(*i*) Credit societies ;

(*ii*) Purchase societies ;

(*iii*) Societies formed for the sale of produce or stock ;

(*iv*) Societies for effecting improvements—*e.g.*, the digging of wells and the construction of bunds, walls and fences, or the planting of hedges ;

(*v*) Societies formed for the aggregation of fragmented holdings and their redistribution in plots of reasonable size ;

(*vi*) Societies for the co-operative use of agricultural machinery ;

(*vii*) Societies for joint farming ;

(*viii*) Cattle breeding societies ;

(*ix*) Societies formed for any purpose connected with agriculture or with the betterment of village life, but not specified above ?

(*c*) Where co-operative schemes for joint improvement, such as co-operative irrigation or co-operative fencing or a co-operative consolidation of holdings scheme, cannot be given effect to owing to the unwillingness of a small minority to join, do you think legislation should be introduced in order to compel such persons to join for the common benefit of all ?

(*d*) Do you consider that those societies of which you have personal knowledge have, in the main, achieved their object ?

23. General Education.

(*a*) Do you wish to make observations upon existing systems of education in their bearing upon the agricultural efficiency of the people ? If you make suggestions, please distinguish, as far as possible, between—

(*i*) Higher or collegiate,

(*ii*) Middle school, and

(*iii*) Elementary school education.

(*b*) (*i*) Can you suggest any methods whereby rural education may improve the ability and culture of agriculturists of all grades while retaining their interest in the land ?

(*ii*) What is your experience of compulsory education in rural areas ?

(*iii*) What is the explanation of the small proportion of boys in rural primary schools who pass through the fourth class ?

24. Attracting Capital.

(*a*) What steps are necessary in order to induce a larger number of men of capital and enterprise to take to agriculture ?

(*b*) What are the factors tending to discourage owners of agricultural land from carrying out improvements ?

25. Welfare of Rural Population.

(*a*) Outside the subjects enumerated above, have you any suggestions to offer for improving hygiene in rural areas and for the promotion of the general well-being and prosperity of the rural population ?

(*b*) Are you, for instance, in favour of Government conducting economic surveys in typical villages with a view to ascertaining the economic position of the cultivators ? If so, what, in your opinion, should be the scope and methods of such enquiries ?

(*c*) If you have carried out anything in the nature of such intensive enquiry, please state the broad conclusions which you reached.

26. Statistics.

(*a*) Do you wish to make suggestions for the extension or improvement of the existing methods of—

(*i*) ascertaining areas under cultivation and crops ;

(*ii*) estimating the yield of agricultural produce ;

(*iii*) enumerating livestock and implements ;

(*iv*) collecting information on land tenure, the incidence of land revenue and the size of the agricultural population ;

(*v*) arranging and publishing agricultural statistics ?

(*b*) Have you any other suggestions to make under this heading ?

MINUTES OF EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION ON AGRICULTURE.

Friday, March 18th, 1927.

PESHAWAR.

PRESENT:

THE MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E. I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Mr. B. S. KAMAT.

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Mr. W. ROBERTSON-BROWN, Agricultural Officer in the North-West Frontier Province.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (i) *Organisation.*—Research in the fundamental principles of agriculture may be carried on chiefly at the Agricultural Research Institute, Pusa. As the need for improved farm practice and better workmanship in the fields is far greater than for strict agricultural investigation, the provinces should consentrate on the more practical farming problems. Too much attention is being given to teaching and research; the Indian cultivator is not ready to make use of the latest results of inquiry.

Administration.—Specialists should devote their lives to their chosen study. The appointment of experts to administrative offices is retarding progress in agricultural science.

Financing.—The views and estimates of agricultural experts might receive more consideration from Finance officers than they now do.

(ii) Veterinary research may very well be left to the Research Institute, Muktesar, until the cultivators have more knowledge of simple veterinary practice.

(*b*) As the cultivators are not yet acquainted with well-established modern methods of agriculture or animal husbandry it is surely not necessary to devote more attention to strict research.

(*c*) So great is the need for better practice in fields, and so numerous are the still neglected recommendations of the research-workers, that it seems hardly desirable to seek fresh subjects for investigation.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) As only a small proportion of those who receive instruction at the Agricultural College actually make true farming their life-work, the institutions for training would appear to be sufficient.

(ii) Apart from the demonstration farm, in no district is there need for more agricultural institutions or teachers.

(iii) Agricultural teachers should not be drawn from rural areas exclusively. Men with experience of the town appreciate opportunities in the country. The youths of so-called agricultural extraction who attend the agricultural colleges spend most of their young lives at a city school.

(iv) As only those desiring to enter Government service study at the agricultural college, the attendance is great enough.

(v) Appointment in one of the Government services.

(vi) They are not all the sons of agriculturists, and this is as it should be.

(vii) The provincial agricultural colleges might be more useful, and perhaps more appreciated by those desiring to farm, if they were schools of agriculture, the students doing most of the work of the farms and the instruction being of a strictly practical kind. In agriculture, as in every other branch of Indian public service, the need of better workmanship is great. The Agricultural Research Institute at Pusa should insist, as is now done in Germany, on all men having not less than two years' practical experience before they are admitted for higher training. For appointment to the Indian Agricultural Service the most promising men in the schools of agriculture might be sent to the Research Institute for training. Excepting to study a special subject or to gain breadth of view it should hardly be necessary for anyone to go out of India for training. Appointment to the Agricultural Service, in all its branches, should be gained in open competition.

(viii) (*a*) Nature study should be an important subject in every school.

(*b*) School plots are rarely ever likely to be truly useful in a country which is mainly agricultural.

(*c*) There is no need for school farms; they are liable to become extremely unattractive; but scholars may with advantage be taken over well-run district agricultural stations and on to the land.

(ix) They enter or try to secure Government service.

(x) By demonstrating in each district that farming on a progressive demonstration farm is profitable; by Government marking its appreciation of worthy farmers in society.

(xi) No. Until the bigger land-holders themselves farm a part of their land, until they have "home farms" whereon good practice and well-bred stock may be seen, the technical knowledge of those desiring to farm in an up-to-date way cannot be improved. The need for home farms is great beyond anything else in uplifting Indian agricultural practice.

(xii) By showing on district demonstration stations and on the home farms that the life thereon is full and fascinating, and that the operations are profitable.

(xiii) Far above educational facilities is the need to show on the demonstration or home farms that good farm practice will enable men to pay for education.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Demonstration of the good and, hardly less, the beautiful and fascinating on the Government agricultural experiment stations.

(*b*) Field demonstrations outside the agricultural experiment stations and demonstration farms can attain little compared with their cost and worry. The cultivators may more profitably be attracted to the demonstration farms.

(*c*) By showing that the practice recommended is practicable and profitable the cultivators can be induced to adopt expert advice.

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(*d*) Pusa No. 4 wheat, having proved the best of many varieties tried at Tarnab, is now the common variety over the greater part of 300,000 acres of irrigated land in the North-West Frontier Province. New varieties of the peach, plum, apricot and pear selected in the trials at Tarnab have almost entirely displaced kinds that were popular for many years at Peshawar. These are but two of many examples of the cultivators' willing acceptance of improved crops.

QUESTION 4.—ADMINISTRATION.—(*a*) The adjustment of the agricultural activities of the Government of India and the Local Governments appears fairly equitable; but the Agricultural Research Institute, Pusa, would probably best serve the country as an acknowledged training college, through which, alone, men might enter the Indian Agricultural Service.

(*b*) The scientific staff of the Government of India should most certainly be sufficiently manned and well enough equipped in every respect to train specialists for the Provinces, and to work on fundamental agricultural principles. The great purpose of the Agricultural Research Institute, Pusa, should be to train scientific workers in research.

(*c*) (i) *Agricultural.* No. Too much attention is devoted to teaching and research; too little to the improvement of practice—to uplifting those who labour in the fields.

Veterinary.—(i)—No. Who needs veterinary aid should pay for it, excepting in measures to prevent the spread of disease. The veterinary hospitals are used chiefly by the carriage-hirer or citizen.

(ii) Yes,—satisfied.

(iii) Yes,—the roads are as good as can be expected.

(iv) Yes,—the weather report is especially useful.

(v) Yes,—satisfied.

(vi) With telegraphs certainly.

Wireless has not so far been applied to agriculture.

QUESTION 5.—FINANCE.—(*a*) Only by the establishment on a sound basis of co-operative credit societies may the cultivators be helped financially. They are nearly all in debt, and cultivate less than 10 acres. On minute holdings or on land for which a high rent is paid, long-term credit on an economic basis appears impossible.

(*b*) *Taccavi* may most usefully be given to help land-holders to undertake some new work of improvement and then the scheme should be critically examined by an expert in the line of work contemplated. To relieve distress in agricultural misfortune *taccavi* is useful. The Department of Agriculture should be consulted on all the agricultural questions wherein *taccavi* is proposed.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The desire without having the necessary capital to be an independent cultivator or farmer rather than labour for another: the practice of landholders who put tenants without capital to cultivate their land: the small size of the holdings of tenants and small landholders alike, are the chief causes of agricultural indebtedness. Compared with these reasons, the expenditure on birth, marriage and death ceremonies, and on litigation, although considerable, is yet comparatively small.

(ii) The landholder, himself in debt, to some extent finances his penniless tenant: the moneylender finances the landholder: or the bania directly finances the landholder's tenant. The small landholder borrows, now that land alienation is prohibited, from the bigger debt-stricken landholder who in turn borrows money to acquire the small landholder's land. For the ceremonies at birth, marriage or death the Bania is the chief creditor. In all these cases the man who lends the money has little security; he is compelled to save his capital and gain a return on it by taking a high rate of interest. Under the circumstances, the moneylender is far from being the unrelenting usurious person he is commonly believed to be.

(iii) An instinctive reluctance, no doubt born of poverty, to pay for anything and a sad lack of the sense of fair dealing in borrowing and paying back, are the chief reasons preventing the repayment of loans. The vast majority of the cultivators who borrow know they cannot repay and few attempt to do so. Rather, when the axe falls, they let land or property or even their personal freedom go to meet their liability. Hardly ever do they make enough money by the loans contracted to repay what they have borrowed.

(*b*) The bigger landholders must farm a liberal part of their holdings. They should endeavour to pay wages and help to uplift those dependent on them. To enforce the application of the Usurious Loans Act, to facilitate the redemption of mortgages can at best but put off the day of reckoning for most small holders, and action would surely inflict injustice on those who have supplied money. It would seem better to let the failures drop out and encourage men with ability and capital to farm in a progressive way. Where almost every small cultivator is in distress, how can relief be given without inflicting hardship on others?

(*c*) No measures should be resorted to that will restrict or control the credit of cultivators, especially the right of mortgage or sale. But non-terminable mortgages should be prohibited.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) The owners of fragments who will not consolidate these may be encouraged to sell them. Nothing in the world will induce the owners of small plots in the North-West Frontier to come to an amicable consolidation arrangement with their neighbours.

(*b*) Chiefly waywardness and the determination to get the best of any bargain: the desire to be the owner of land however small the area.

(*c*) Cases may be dealt with on their merits alone. It is improbable that legislation would give general satisfaction.

QUESTION 8.—IRRIGATION.—(*a*) In Dera Ismail Khan a project is being examined.

(1) The District and Public Works Department canals of the Province urgently require detailed critical study and probably considerable remodelling. Wide areas of land are being put out of cultivation by seepage, by inefficient, ill-aligned and badly maintained water-courses; by the presence of water-mills on the canals; by neglect on the part of cultivators of fundamental principles in irrigation. The landholders must and probably would accept any action that promised to save the land from becoming unculturable, and to be for the good of the community. The need of drainage and more strict control of the existing canals is infinitely greater than the need for new irrigation projects.

(*b*) The methods of distributing the supplies are satisfactory. The great defects are the almost total lack of drainage, the inefficient water-courses, the neglect of the ordinary common-sense rules of irrigation, the presence of many ill-placed mills on the canals.

QUESTION 9.—SOILS.—(i) Above all else an examination of the areas which are water-logged or saline, followed by hearty co-operation in drainage schemes between the Irrigation Engineers and the landholders are necessary. The surplus water removed, the cultivators may be trusted to improve wide areas which are now out of cultivation or are rapidly becoming unculturable.

(ii) The areas devastated by alkali may be left untouched for the present. To save more land from ruin is the obvious urgent line of action. Given abundant water and efficient drainage, much salt land can be reclaimed.

(iii) By the preliminary study of areas scoured by hill-torrents and thereafter, in co-operation with the cultivators, the establishment of dams,

banks, plantations, pasture, &c., there is no doubt extensive areas of good land may be brought under cultivation; but for the present work should be conserved in saving the cultivated land of the Province that is being ruined by irrigation without drainage.

(*b*) (i) Whilst numerous small areas have shown marked improvement by drainage and good farm practice, no extensive tract has been improved. In fact, neither the soil nor the farming over most of the Province have improved in the past 16 years. Much land has markedly decreased in productiveness.

(ii) Due to the practice of irrigation without drainage, a very large part of the land on the Lower Swat Canal has certainly deteriorated within the past 16 years.

(*c*) The charges made for irrigation should be high enough to permit the allotment of money to drainage schemes, the maintenance of the more important water-courses, the supervision of every water-course.

Inefficiently or carelessly used irrigation renders land unculturable. There is no irrigated area in the North-West Frontier Province on which careless practice is not actually threatening to put land out of cultivation. On the other hand, there is no extensive area on which good crops can be produced without irrigation.

QUESTION 10.—FERTILISERS.—(*a*) The cultivators quite understand the use of natural manures, and use what they have with considerable skill and economy. The method of conserving the supply is by no means bad, bearing in mind the circumstances met in collecting the material.

(*b*) The few who may purchase artificial fertilisers are astute enough to request a statement of composition with the consignment. The chemists of the Department of Agriculture in the present state of progress might and probably do undertake to give, on payment, analyses of artificial fertilisers. Until there is a trade of some value in the manure, laws regulating it are hardly required.

(*c*) By demonstrating the advantages of fertilisers on the Government farms; by publishing information on their use.

(*d*) No artificial manure to speak of is used in the Province. Of farmyard manure everyone everywhere uses all that is available. The advantages of green manuring, the benefits following leguminous crops are well understood by the cultivators.

(*e*) On the Agricultural Station, Tarnab, the practice for some years has been to apply not more than 16 cartloads of farmyard manure per acre to any crop, and to supplement this with artificial manures. The phosphates, nitrates and potash manures have acted as they are expected to do, and have been found profitable, the farming being very intensive, the crops—wheat, maize, sugarcane, chillies, green fodders, extensive orchards and some pasture. Green manuring has also been practised at Tarnab and in all the irrigated country round. In India, where the holdings are small and often occupied for not more than three years, the use of artificial manures may hardly be safely encouraged.

(*f*) By encouraging the establishment of fuel—plantations, groups and lines of trees to supply fuel. In the North-West Frontier Province the practice of using cow-dung cakes does not prevail to a great extent. But almost anywhere the dung that goes to make the fuel is gathered from roads and places where it would otherwise be lost to the fields.

QUESTION 11.—CROPS.—(*a*) (i) By breeding and selection, improvement is proceeding on sound lines and quite fast enough.

(ii) The arable crops in favour meet the requirements very well. In maize, wheat, sugarcane, cotton, fruits, barley, gram, *arhar*, *moth*, *mung*, clovers, oil-seeds, etc., etc., there is a liberal variety all the year round. The great aim must be at growing these crops well. At the same time there

is and will probably always be opportunity to introduce new crops such as sugar-beet, other root crops, legumes like the ground-nut, etc.

(iii) New or improved and pure seeds are most successfully sent out on payment; the demand is sure when their merits are shown on the demonstration farms. Given free of cost, seeds and plants do not always reach those who may make the best use of them.

(iv) Dámage of any great importance is rarely done by animals in the North-West Frontier Province. The jackal spoils some sugarcane by chewing it; a variety which this animal does not appear to appreciate is on trial.

(*b*) Sugar-beet, which has grown extraordinarily well at Tarnab, may prove to be a valuable crop in the Peshawar District. The potato yields well and is grown on the hills and in the vicinity of Peshawar; but as fresh seed must be purchased annually from the hills at a cost of about Rs.50 to Rs.60 per acre, and as the potatoes rot in the hot summer days, there is no prospect of the useful tuber becoming a popular common food in the lower valleys of the Province. Vegetables might with great advantage be grown by the cultivators for their households, if they dwelt on the land and so could protect the plots; but they live in the villages. As fruit trees must be protected when they are bearing, as most kinds require treatment which the small farmer cannot give and, not least, as trees afford shelter for birds which injure the grain crops, it is rarely advisable to encourage fruit-growing on small holdings.

(*c*) All the important or staple crops have been improved considerably by the introduction of new varieties in the past 16 years.

QUESTION 12.—CULTIVATION.—(i) Diligently and efficiently performed, the farm practice is good and well-adapted to the size of the holdings. Every cultivator of ten or more acres should however possess a Rajah plough or other suitable soil-inverting plough.

(ii) The rotations are sound and suitable. Mixed crops are not grown in the Province. The introduction of a root crop would tend to improve the wheat, maize—in fact all of the crops which now are grown.

QUESTION 13.—CROP-PROTECTION, INTERNAL AND EXTERNAL.—(i) The measures in force to exclude external pests and diseases seem adequate.

(ii) Until education is more general and has improved the outlook of the farmer, measures against internal infection can hardly be adopted.

QUESTION 14.—IMPLEMENTS.—(*a*) A long series of tests on 180 acres at Tarnab has shown that positively on ten or more acres, every cultivator should have a good, light, soil-inverting plough. Until the power of the bullocks has been greatly increased no other of the implements tried need be added to the small farmers' stock of country implements.

(*b*) The weight and power of the draught animals must be improved.

(*c*) The manufacturers of implements have done and are doing their share towards improvement thoroughly well and at great sacrifice. The prices of the implements are rarely prohibitive to those who can use them. But there is no prospect whatever of modern implements being used until bullocks fit to draw them have been bred.

QUESTION 15.—VETERINARY.—(*a*) It should be under the Director of Agriculture.

(*b*) (i) They are under the District Boards, and the system has failed.

(ii) There is no need for an expansion of the present system.

(iii) Yes.

(*c*) (i) They very rarely use them because they are situated in the towns or tahsil headquarters distant from the villages: it is not often possible to let a sick animal which has to be fed and attended to remain at the dispensary: an ailing bullock is often not worth veterinary aid and the

cost of maintaining it away from home: in most minor affections or afflictions the cultivators are able to adopt more or less suitable measures. So far as the farmers are concerned, it might be best if a man with some veterinary training were employed at each agricultural station or demonstration farm. At present the dispensaries are used chiefly by the carriage hirer, the mounted police, the citizens. The time has perhaps come when trained men might set up in private veterinary practice in the towns and cities.

(ii) There are no touring dispensaries in the Province, and it is hard to see how they may be really economical or truly beneficial.

(*d*) The life of the cultivators is communal; the animals come nightly into the village dwellings; segregation is impossible. Then those owners whose cattle are not stricken in epidemics elude having them treated. Legislation would inflict hardship greater than its benefits in the present stage of animal husbandry. Until the bigger landholders have herds of well-bred cattle impelling them to resort to preventive measures, legislation dealing with segregation, notification, and other measures in outbreaks of disease must be fraught with insurmountable difficulties.

(*e*) There is difficulty but this could no doubt be overcome if other circumstances were favourable to inoculation.

(*f*) Faith in the Great Creator, and the reasons stated at (*e*) above. It is not a fee that would stand in the way of popularising preventive inoculation.

(*g*) (i) Not at present. Plain uphill work in establishing herds on modern lines is more to be desired.

(ii) The setting up of provincial research institutions is not necessary.

(*h*) (i) Yes,—by the officers of the Muktesar Institute.

(ii) The provincial veterinary officers surely have a wider field of work than they are able to overcome, in getting veterinary recommendations observed in the Provinces.

(i) In view of the opinions expressed above, a superior veterinary officer with the Government of India does not appear necessary.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) By making it perfectly plain that the first duty of the bigger landholders is to their land and their tenants: by Government refraining from imposing duties on landholders that may take them off their land, cattle-breeding on home farms may receive more attention than at present.

(ii) No marked improvement in dairy cattle and dairying can be expected until the landholders maintain herds of pedigree cattle.

(iii) There really is no animal husbandry worthy of notice in the North-West Frontier Province. By paying premiums on registered pure-bred bulls the humble cultivators on certain tracts in the Punjab for example are encouraged to take interest in maintaining a few pedigree cattle. But the schemes appear rather to aim at keeping a number of animals pure for the good time when the bigger landholders shall take up cattle-breeding.

(*b*) (i) Excepting by the banks of certain rivers and streams, there is nothing that might be called common pasture in the Province, and no measure to prevent the overstocking of river-sides would be acceptable to the people.

(ii) Good farmers of course aim at having the common borders of fields as small as possible. When the bigger landholders breed good cattle they will surely make paddocks for them. Suitable grasses are available and other circumstances are not unfavourable.

(iii) The best cultivators usually secure a reasonable amount of dry fodder, catch crops, stalks of cereals, pulses, etc., etc. They depend far more on this kind of cattle-food than on pasture.

(iv) The cultivators of the North-West Frontier Province are fortunate in this respect. By growing the annual clovers called *shaftal* and *berseem*

they may have an ample supply of lush green fodder from November to June. Thereafter Sorghum, maize, grasses, the stalks of crops, etc., are available to the man with forethought.

(v) With the fodders already mentioned and a little maize, barley, and gram all from a soil well supplied as a rule with lime, the necessary mineral constituents are not deficient.

(*c*) On unirrigated land, in January, February and early March; on irrigated tracts, January and February, and sometimes in June. But in the hands of a good farmer there should rarely be any period of serious fodder famine in the North-West Frontier Province.

(*d*) On irrigated land the skilful farmer should have no real difficulty in maintaining a supply of cattle food the year round. The problem is of course harder on unirrigated tracts; indeed the cattle thereon must undergo some hardship; they must exist on chopped wheat, straw and oil-cakes, on dry grasses and loppings from trees, etc. By establishing plantations, groups, lines, etc., in the dry tracts, of trees such as the *locust*, olive, mesquite, *ber*, mulberry, fig, even the *shisham* and numerous other drought resistant trees, the days of fodder famine may be ameliorated. The extensive plantation of the locust is especially desirable on both irrigated and *barani* tracts.

(*e*) By relieving them of revenue, police, and other Government duties which they say occupy their time and prevent them from farming, the bigger landholders might be impelled to attend to their legitimate work on the land. So long as they are able to plead engagement on Government business the landholders will not practise farming. By making it plain that enterprise in agriculture leads to honour and pride of place in the estimation of Government and in the opinion of their neighbours, the leading men would surely farm.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) The average cultivator, small holder, tenant or even labourer does not truly work even so little as six hours on 200 days of the year. They might be profitably employed, if they had hope, enterprise and ambition, eight hours per day 250 of the days of the year, yet still have 52 full days of rest, 52 half holidays, 20 celebration holidays, with 20 days allowed for family troubles or sickness. There is no real slack season on even so little as five acres of good irrigated land to the keen cultivator. The great majority of men spend endless weary idle days in the village when they ought to be busy in the fields. Everywhere the crops suffer from neglect and not, as is generally supposed, from a lack of knowledge of good practice. On unirrigated crops there are slack seasons, but in the North-West Frontier Province, work on the roads, contract carting, making baskets or ropes, cutting fuel, etc., etc., provide a reasonable amount of employment. Considerable suitable work might also, in the course of time, be provided by the establishment of plantations on the unirrigated tracts. Yet there is plenty true agricultural work almost everywhere now, if the landholders will but settle down to it.

(*b*) Almost sufficient wild honey is procurable by those who most desire it and can pay for the luxury. The demand for high class section honey would hardly warrant many people making even a subsidiary business of bee-keeping. Then the wild bee appears to take ill to domestication and imported bees, where they have been tried, have failed on the hot plains, Still, further experiments are desirable. Poultry-keeping is not, and can hardly be, profitable with eggs selling at 3 to 4 annas per dozen and chickens at 8 to 12 annas. Fowls cannot be fed at the prices. The hens must long continue as at present to pick up their living in the village. Fruit-growing conducted on progressive lines is highly profitable and, as a business apart from farming, is extending at Peshawar. Treated as a subsidiary industry, however, small orchards are rarely remunerative. Where it has been tried, sericulture has not proved profitable. On the

hills whereon excellent material for making ropes, baskets, mats, etc., etc., is abundantly available, the business is well-established. By the rivers also a species of tamarisk yields unlimited supplies of withies suitable for making a great variety of cheap baskets. In short subsidiary industries can be established only where suitable raw material is plentiful and cheap. In the pursuit of progressive intensive farming there is work for every willing man in the North-West Frontier Province.

(*c*) No,—it should surely be better to leave the work to the enterprise of business men.

(*d*) No,—the effect would rather be to throw many men idle in the country over considerable parts of the year; to make those who at times cannot get work in the factory unfit for the employment which is nearly always open to them in the fields.

(*e*) Yes,—this would surely lead to some improvement provided the cost of the study were not too great.

(*f*) No measures can offer greater rural advantages than better farming.

(*g*) A beginning in this direction can best be made by the educated and well-to-do of the villages and towns. It would not appear that Government can do anything in the matter.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) There is no shortage of labour on well-established cultivated areas in the Province.

(ii) There is a great shortage of settlers and labour on the new Upper Swat Canal, due chiefly to families being unwilling to move permanently, even so far as two days' journey, from the home in which they were born. Then the terms of tenancy or employment offered by the landholders are not attractive or favourable to pioneers. Not much of the new land is fertile and it is not yet levelled or adapted to irrigation. The fear prevails that, having worked and put the land into a more or less cultivated profitable state, the landholders may at any time offer it at an enhanced rent to new tenants. Without security of tenure why, it is asked, should men desert their old homes to undertake pioneering? It is the hope of acquiring possession that will tempt worthy men to part from their relations and a pittance. That "union is strength" is the faith of every frontiersman; the prevalence of feuds is due to allegiance to kith and kin. If the bigger landholders will put the more fertile tracts of the new canal area in a fit state for farming and offer this on lease for not less than ten years at a rent on which pioneers can live, the tract may be populated.

QUESTION 19.—FORESTS.—(*a*) Yes.—the forests on the hills are fully and suitably used.

(*b*) By establishing drought resistant trees and shrubs on the dry more or less unculturable areas; by encouraging the landholders to set out plantations on uncultivated areas, by planting copse-woods rather than big shade trees along the banks of the canals, road-sides and railways; by demonstrating on Government land that all this is possible; in short by giving some attention to sylviculture on the plains.

(*c*) Yes,—most of the hills of the North-West Frontier Province are more or less bare of trees or even vegetation, yet certain areas clearly show that only protection is required to get them clothed again. The greater part of the Province has been rendered unculturable by forest denudation on the hills. And as reafforestation can only be gained by protection; and as most of the hills are in Independent territory, nothing can be undertaken at present. There are wide tracts within the Province which could be clothed, but at a great expenditure and with no prospect of a reasonably early and adequate return.

(*d*) Only by protecting wide areas of the hills, mostly in Independent territory, may the bare slopes be clothed and the land below saved from erosion and rendered culturable. The imperative need of forest conservancy

on the mountains and hills has resulted in the neglect of sylviculture on the plains. There is great scope for planting on the cultivated tracts.

(*e*) Not afforestation—but there are opportunities for sylviculture.

(*f*) Excessive grazing on the hills of the Province is rare; destruction by unbridled hill-torrents has long been and is still, due to forest denudation on the borders of the Province.

QUESTION 20.—MARKETING.—(*a*) Yes, on the whole. The holdings are so small, the parcels of produce so tiny, that the cultivators cannot hope to do better than trust to those who collect and sell their grain, etc., until co-operative marketing becomes widespread.

(*b*) Please see separate note on marketing,* etc.

(*c*) Not in the present stage of trade in the North-West Frontier Province.

(*d*) Yes—it would be a distinct aid if prices were regularly posted in the leading markets.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—Not in the present stage of progress in the North-West Frontier Province.

QUESTION 22.—CO-OPERATION.—(*a*) and (*b*) Very little evidence of the wish or will to co-operate has been shown thus far in the Province; but a trial has been undertaken in one district and is being closely observed. The greatest need is for credit societies.

(*c*) Legislation to compel the cultivators to join co-operative societies is not advisable meantime. The principles, the aims and benefits of co-operation, may first be brought to the notice of the villages in the manner which experience in co-operative work has shown to be best.

QUESTION 23.—GENERAL EDUCATION.—(*a*) (i) For the sons of the bigger landholders who intend to farm and who have the desire to raise the standard of life of those engaged in the business, for every one hoping to serve in the Revenue Department of Government, higher or collegiate education, especially in the sciences relating to agriculture, is essential. A high value should be set on these studies in the college examination and especially in appointing Government servants.

The great aim may surely be to show how those in authority may help to make rural life better and brighter. At present the higher or collegiate education is not sending any men to farm. Yet farming offers great scope and a man's life to the educated or enterprising, to the well-to-do. Farming is neglected utterly by the landholders who could most easily take it up; they clamour for Government posts or join the crowded professions. The desire of collegiate men who have no capital to gain a living in the cities is certainly laudable and generally wise, for they may hope there to set out in life on a higher pay than the clever experienced workman in the fields can ever earn. The desertion of farming by the educated is to be deplored. That pride of place has long been given in the sight of men to the frequenters of the towns has undoubtedly impelled landholders to neglect agriculture. Unfortunately it has to be admitted that the collegiate man in the village is perforce cut off from educated society.

(ii) The beauty, the romance of the natural sciences might well be more important subjects than they are in the middle schools, even at the cost of some proficiency in what now comprises general education.

(iii) Far more important than the three R's, moral understanding is essential at this stage in any one's education. The love of the good, the beautiful and brave are won or lost before the age of 12 is reached. Every lesson should tend to cultivate this. To the teacher who has the rare gift of observation and who has country lore, the fields are better than any mere poky school plot or garden. It must be rare indeed that the teacher is able to teach rural schoolboys aught in agricultural practice.

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* See Appendix on page ~~152-A~~ 153

(*b*) (i) Education in the country need not differ very much from that which is best in the towns. In both, the beauties and wonders of nature, the romance of travel, of the sciences may find a place; country walks and talks may be equally useful and appreciated in the town and country. The important fact is that in India, as in any other country, there is no place for more than the three R's, with story and romance, in the life of the scholar under 12 years of age.

(ii) There is no compulsory education in the Province.

(iii) The fact that in the present stage of progress in rural parts primary education offers no useful advantage to those who work on the land. On all the fields of the North-West Frontier Province there may not be a dozen boys able to read or write. Education to the age of 12 only is of little value to any one in any country.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) By giving a long lease at a moderate cash rent; by providing a respectable home and steading. The rent is altogether too high at present; the custom of taking a half or a third of the produce as rent must deter any free man from farming. In these directions the bigger landholders only can take the initiative. The tenant on the other hand should hire labour on cash wages and for not less than six months. Government may show on bright demonstration farms that the business is not only profitable but that it affords an eager happy useful life, and that farmers may be as progressive and cultured as men in the towns.

(*b*) The short term lease, the tenants lack of capital, the smallholding, the knowledge that although the business of farming yields a living and a free life it rarely produces a commensurate monetary return on the capital and labour involved. The staple crops on a small area of rich irrigated land are hardly ever profitable; on the other hand there are not markets for the products of intensive farming.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) It would soon be ascertained what the landholders may attempt and how the tenants live, if the Government could, after a close study of every detail, acquire a small village or group of hamlets in a thickly populated area, with its land of not less than 100 acres and, as landlord, remodel the dwellings, demonstrate the advantages of sanitation, finance selected tenants—do, in fact, all that which a good landholder is recommended to undertake, and keep accurate records of the income and expenditure of the tenants and the entire scheme. There would be no difficulty in acquiring the land with its hamlets, and the cultivators would heartily welcome the undertaking. To do all this on a new area without population would not yield the desired information or bring the advantages of better sanitation to public notice.

(*b*) It seems unnecessary to make an economic survey of the entire village. It would surely be enough to know exactly the income and expenditure of typical small farmers on the various tracts, of families on 5, 10, 20 or more acres, of those in debt or free of it, of tenants working on the prevailing rents, of those paying cash, or rent in kind, etc.

(*c*) In 30 villages situated on irrigated land in the five tahsils of the Peshawar district an enquiry was carried out by the Agricultural Officer and an experienced Assistant in the year 1923. Right in the villages, surrounded by the landholders and a large company of cultivators, with the advantage that every one present knew that the enquirers had accurate intimate knowledge of farm practice, its cost or profit or loss, the investigation was conducted with perfect frankness on both sides. The broad conclusions were that (*a*) nearly every landholder, big or small, was deep in debt, (*b*) tenants are all in debt, generally to those whose land they cultivate, (*c*) the smallholder who is not in debt can make a living for himself and family on five acres but he cannot send his children to school, (*d*) the

tenant giving half the produce as rent cannot live decently on five or even ten acres: he would be better off if he were regularly employed on even so little as annas 0-10-0 per day, (*e*) the custom of taking half or less of the produce instead of a moderate cash rent is a great obstacle to agricultural progress, (*f*) the rent charged for the bare irrigated land without a steading or even a dwelling throughout the Peshawar District is about double that demanded for the best arable land in England with a house and steading on the farm. On the rents now prevailing no farmer with capital, however enterprising and experienced he may be, can farm a reasonably big area of land at a profit.

Oral Evidence.

46,766. *The Chairman*: Mr. Robertson-Brown, you are Agricultural Officer in the North-West Frontier Province?—Yes.

46,767. Would you give the Commission an account of your own training and any past appointments that you may have held?—I studied at the Royal Horticultural Society, fruit culture and botany; at Cooper's Hill, entomology and botany; at the London Polytechnic, advanced agriculture; I had estate training in Lanarkshire, Kirkcudbrightshire and Banffshire. My first experience was gained in the Indian Gardeners' Service; I toured in South Africa, visiting the Agricultural Colleges there; I have been here, at Peshawar, for 16 years. That is all.

46,768. At the bottom of page 5 of the Provincial memorandum,* it is stated that the sanctioned staff of the farm consists of yourself, six Agricultural Assistants and four clerks. Is that correct to-day?—It is correct to-day excepting that we are one man short at present, and that appointment is now being filled by a young man who has been sent to Lyallpur for training.

46,769. What other staff have you in the Province?—That comprises the whole staff.

46,770. And how is that staff disposed at the moment?—One is the Farm Manager at Tarnab, another is in charge of fruit; there is one in charge of the Kurram Valley, one in Waziristan, and one in Hazara.

46,771. Have you any peripatetic demonstrators travelling about the country at all?—No; in the Kurram there are no very definite headquarters, and the man is engaged in going about hither and thither; in Hazara there is a small farm, so small that the man is able more or less to be constantly on tour.

46,772. Broadly speaking, it is the case, is it not, that if zamindars are to have the advantage of what you can show them or teach them, they have to come to you?—That is the case.

46,773. To turn to your note: you say in answer to our Question 1 (ii) (*b*): "As the cultivators are not yet acquainted with well-established modern methods of agriculture or animal husbandry it is surely not necessary to devote more attention to strict research." I suggest to you, on that point, that research must necessarily to some extent keep ahead of practice and of methods actually demonstrated?—By research I mean that which is really fundamental, that which the chemist or the botanist would do; in other words, more profound researches into subjects like botany and chemistry.

46,774. Unless research does keep ahead of practice there is a danger that you may create a demand and suddenly find that you have no supply?—When I speak of research I refer to the more profound researches.

* Not printed.

46,775. While you say, on page 2, in answer to our Question 2 (viii) (*a*), that nature study should be made an important subject in every school, you do not think that school plots are useful?—That is my opinion.

46,776. Is that founded on experience?—On observation.

46,777. In this Province?—No; beyond its borders.

46,778. Have you had an opportunity of judging of the usefulness of the school plots where they exist in the Punjab?—Nothing further than looking carefully at two schools at work and observing the boys at work. What I observed was that boys really were more skilful than their masters, because they were agriculturists by birth.

46,779. *Mr. Calvert*: Where was that?—Near Lyallpur.

46,780. *The Chairman*: Would you turn to page 2. You say: "Demonstration of the good and, hardly less, the beautiful and fascinating on the Government agricultural experiment stations." Do you find that there is a tendency on the part of the zamindars to question the practical value of demonstration carried out on a Government farm because, in their view, that farm is lavishly provided with manure, with improved implements, with superfine cattle, and so on?—Yes; the demonstrations in the Government farms are mostly of superior crops, better animals or better varieties.

46,781. Do you not find that results shown on Government farms are regarded with some suspicion? The zamindar says: "After all, you are in charge of the Government farm and you have got Government funds behind you, and you have every opportunity to employ labour"?—It is true that they invariably say that we have got the treasury behind us.

46,782. To what extent do you develop the beautiful and the fascinating on your own experimental stations?—They appreciate that which is pleasing; the aim is at attracting visitors to the farms.

46,783. In the next paragraph you say: "Field demonstrations outside the agricultural experiment stations can attain little compared with their cost and worry. The cultivators may more profitably be attracted to the demonstration farms." Do you not think that it is important that demonstration should be carried out under conditions as much as possible like those of the normal zamindar's holding?—I think they are clever enough to appreciate any difference there is; in carrying out experiments in the village the difficulty is to get done what is wanted; they prefer going their own way, and it is really very hard to control them in that matter.

46,784. Would you give us a description of your seed distribution organisation?—Until four years ago, seed was more or less distributed free of cost to those who desired it; intimation was given to the effect that seed was available and those who wanted it came for it. Now anyone comes to the headquarters and gets what we have; the area of ground from which we can provide seed is comparatively limited; we can only grow more or less a nucleus stock to those who need it; we have no seed farms.

46,785. Have you attempted to make any arrangements with large cultivators to grow your seeds and to multiply them for purposes of distribution?—Yes; Pusa No. 4 wheat, for example, has spread over the greater part of the Mardan and Charsadda tahsils largely through one or two men who have grown and distributed our seed.

46,786. What was the arrangement between yourselves and these people?—They were provided with a nucleus of seed free of cost for propagation, and they sold their crops to those around them.

46,787. Who sold the seed?—The men who grew it.

46,788. It did not come back to your department?—No.

46,789. Were you responsible in any way for the purity of the seed when sold?—No; excepting that an Assistant went round and examined the seed, and he personally knew every field from which the seed came.

46,790. When you yourself sell seed, how do you fix your price?—The local market rate plus four annas; that is for wheat.

46,791. Why do you add four annas?—Because nice, clean, pure seed might be used for breadmaking.

46,792. *Sir Ganga Ram*: Is it to cover establishment charges?—No, it is to make quite certain that the seed shall be sown in the field and not be used for food.

46,793. *Mr. Calvert*: Four annas a maund?—Approximately that.

46,794. *The Chairman*: On page 3, in answer to our Question 4 (*a*), you say: "Pusa would probably best serve the country as an acknowledged training college through which, alone, men might enter the Indian Agricultural Service." What do you mean exactly by the Indian Agricultural Service?—The service which is now Indianised; the training, in my opinion, is admirable, but the higher form of training can be best got at Pusa. I do not thnk it would be good to go to the Agricultural Service straight from Lyallpur, for instance, without first of all going to Pusa for final training.

46,795. You mean that every Indian going over into the present Provincial Service or the new Superior Provincial Service ought to pass through Pusa?—The Superior Provincial Service only.

46,796. On page 3, in answer to our Question 5 (*b*), you are dealing with the question of *taccavi* loans, and you say: "The Department of Agriculture should be consulted on all the agricultural questions wherein *taccavi* is proposed." What are you thinking of when you say agricultural questions?—For any improvement that a man may wish to carry out on his own land, I think it is advisable that the Agricultural Department should look into the matter to see whether it would be feasible or advisable.

46,797. Under existing arrangements, does the Agricultural Department not hear about these matters?—Not under existing arrangements; we are a very small department.

46,798. On page 4, in answer to our Question 8 on Irrigation, you convey the view that the problems of water-logging and consequent deterioration of the soil are serious and are likely to grow still more serious?—Yes, that is my opinion.

46,799. Is it held that this water-logging is due to seepage from the main and feeder canals, or it is due to over-irrigation in the ordinary sense?—It is a combination of both.

46,800. Is it mainly seepage from the canals?—I think not; I think it is due, in large measure, to the lack of control of water courses by the cultivator.

46,801. What makes you think that it is due to irrigation proper and not to seepage from the canals?—I have come to that conclusion through my constant touring over the land; I ride the country yard by yard.

46,802. How long have you known this Province intimately?—Since 1910.

46,803. Can you tell the Commission whether there has been a marked deterioration in this situation since 1910?—Yes; in my opinion things have got worse; there is more land going out of cultivation.

46,804. Due to salt efflorescence?—Chiefly.

46,805. *Professor Gangulee*: Can you give us an idea of the area?—I cannot do that.

46,806. *The Chairman*: Have you formed the view that the mischief could best be met by drainage schemes or by raising the water from the sub-soil by means of wells?—I think it could best be met by drainage.

46,807. If you have got a good fall, in that case you think drainage would be the best way?—Yes.

46,808. Is drainage attempted on any important scale?—Yes, in Mardan it is under construction, I believe.

46,809. Are there any instances where any area of land affected by water-logging and by salt has been improved by drainage?—Yes, one cultivator has carried out drainage, but nothing much has been done by Government so far as I am aware.

46,810. Has much of the land affected gone out of cultivation?—Yes, a considerable area has gone out of cultivation.

46,811. Have the cultivators moved or taken up land in the neighbourhood?—Much of the salt land is the property of those who own very extensive areas.

46,812. Was it cultivated by the same persons, or by tenants?—By tenants; the tenants keep moving about, taking up the land for two, three, or four years on short leases; as a matter of fact they are addicted to moving about constantly.

46,813. *Sir Henry Lawrence*: They leave one land and go to another?—Yes, they are tenants possessing very little capital.

46,814. *The Chairman*: Do you find that, as a rule, land vacated after three years' holding is re-occupied by a new tenant in the same year, or is it left to lie fallow?—That which is worth cultivating is rarely left entirely fallow; there is always another man ready to cultivate it.

46,815. It is not a form of shifting cultivation?—No.

46,816. On page 5 you say: "The cultivators quite understand the use of natural manures, and use what they have with considerable skill and economy," and you say that the method of conserving the supply is by no means bad. What is the method?—It is done very largely close to the dwelling which is surrounded by a wall; the manure is put in one corner, and, as the rainfall is light, there is little or no fear of the rain affecting it harmfully.

46,817. Is it covered over?—No.

46,818. Is cowdung burnt to any extent?—Not to any great extent; at any rate, less than is the case down country.

46,819. Is that because there is more fuel available?—That may be so, especially in the Peshawar Valley.

46,820. You give the quantity of farmyard manure to be applied to the land as 16 cartloads per acre. What would be the weight of your cartload here?—About three-quarters of a ton; I do not really mean that every crop which is grown gets that quantity; once in a rotation of three years the application is given.

46,821. When they do manure a field that is approximately the dressing given?—Yes.

46,822. You say that you do not think that it is sound to recommend the use of artificial manures because cultivators are so often moving every three or four years. Do you take that view because you are not certain that the man would be able to exhaust the value put into the land before he leaves?—Knowing how readily he may take the manurial value from the land he may take too much before he leaves it; the lease being so short, he may apply the nitrate heavily and leave nothing for the man who follows.

46,823. On page 5, in answer to our Question 11, under the heading "Crops," you say: "By breeding and selection, improvement is proceeding on sound lines and quite fast enough." Why do you suggest that improvement is going on fast enough in this matter?—Because there is no need for too rapid changes. We have got a good wheat for example; let it go on for some time; it is no good constantly changing varieties.

46,824. I think that if they have their crop increased by, let us say, 25 per cent., they will be able to bear the shock with a very even mind?—Undoubtedly, but there is such a great deal of difficulty in getting new varieties out again; Pusa 4 is grown on perhaps very nearly 300,000 acres in this Province, and to introduce another would entail years of trouble.

46,825. *Professor Gangulee*: There you are thinking chiefly of wheat?—Equally of sugarcane.

46,826. *The Chairman*: Again on page 6, in answer to Question 11, you mention the difficulty of storing potatoes through the hot months. Have you attempted storage below ground here?—Yes.

46,827. Has it proved a success or a failure?—A failure.

46,828. Due to humidity?—Yes, and excessive heat.

46,829. Is it really the case, in your view, that fruit trees on a farm aggravate the damage done by birds?—Yes, this is the case with fruit trees or any other trees; the birds take the nearest tree and sail over the land, and as the fields are small it is somewhat difficult for each plot to be protected; the birds move over the land in dark clouds.

46,830. Is it your considered opinion that fruit-growing does not work in satisfactorily with the practice of farming on the ordinary small holding in this Province?—Yes.

46,831. Are there any other difficulties which you have not mentioned?—There is one point and that is with regard to the special marketing of fruit.

46,832. If you had an organisation amongst your small men it might be possible to market collectively, might it not?—I think it would be extremely difficult and even hardly advisable to have this; I would rather like to see fruit really well grown because there is no market for the common fruit, of which we have a great abundance.

46,833. Would you let us have a note of typical rotations of crops?—Yes, I can give it to you now. They are clover, sugarcane, chillies, wheat, clover again. Then there is clover, maize, wheat, wheat again, and clover, and so forth.

46,834. *Sir Ganga Ram*: You do not put wheat after maize?—Always; of the maize which is grown probably 75 per cent. is followed by wheat.

46,835. Immediately after?—Yes, within 10 days.

46,836. Does that give you a good yield?—Yes, the wheat is lightly manured; all over the Peshawar Valley wheat follows maize.

46,837. What class of clover do you use here?—*Berseem*, which we got really from Pusa originally, that is about 15 years ago; and there is an indigenous clover called *shaftal*.

46,838. *Mr. Calvert*: These are irrigated rotations?—Yes.

46,839. *The Chairman*: These are two typical rotations on irrigated land?—Yes.

46,840. Have you a dry rotation?—Very largely oilseeds, and wheat, or wheat after wheat.

Mixed crop or pure?—Pure.

46,841. Where does your potato come in?—It is not part of the rotation which is customary on purely agricultural land.

46,842. On your potato land, do you grow potatoes year after year?—There are summer crops which may be one of the capsicum family, or it may be maize or juar for fodder; but the potatoes are mostly grown round the towns, and of course on the hills during the summer; the bulk comes from the hills.

46,843. Are they grown in the hills on ground that is tilled regularly year by year, or are the patches moved about?—On ground that is tilled regularly; the rotation may be maize, it may be a pulse of some kind.

46,844. Is wood ash a favourite manure for potatoes?—No, the manure most favoured for potatoes round about Peshawar is the city sweepings.

46,845. *Sir Ganga Ram*: What about castor cake?—They do not know that; it is not used here, although it is popularly down country.

46,846. *The Chairman*: On page 6, in answer to our Question 14, you are talking of agricultural implements. You say, "A long series of tests on 180 acres at Tarnab has shown that positively on 10 or more acres, every cultivator should have a good light-soil-inverting plough." Is that test designed to discover the value of inversion against non-inversion ploughs?—The chief object has been to eradicate root weeds; this can only be done with difficulty by the country plough, whereas the soil-inverting plough does it admirably.

46,847. Is it mainly because of its capacity to kill weeds that you use the soil-inverting plough?—Yes, that is so.

46,848. In answer to Question 15 on veterinary matters, you say that the veterinary dispensaries are under the District Boards and that the system has failed. Do you suggest that the system should be changed?—Yes, I think so.

46,849. Would you take the dispensaries away from the District Boards?—Yes.

46,850. Do you not think that would be regarded as rather a backward step?—The District Boards would be glad to be rid of them as far as I am able to judge, as their maintenance is rather a heavy charge on the District Boards.

46,851. Where are your dispensaries?—Invariably close by the cities or towns.

46,852. How many of them have you in the Province?—I am afraid I cannot answer that question, but the Veterinary Officer will perhaps give you the information.

46,853. *Mr. Calvert*: There are 16.

46,854. *The Chairman*: I see, on page 11 of the Provincial memorandum, a list is given of the average size of the holdings district by district, and the average varies between 1·5 and 6·1. Are there many holdings of 10 acres and over?—Quite a large number in Mardan and Charsadda.

46,855. On page 8 you suggest that large landowners should be relieved of revenue, police, and other Government duties. What duties are those?—Collecting revenue, doing police work, and so on. I do not for a moment say that it is entirely possible, but they might be relieved as far as possible.

46,856. Do you think that these reasons are valid or are they excuses?—They are excuses in large measure.

46,857. Do you not think that men with sufficient intelligence to discover these excuses would find others if you removed these?—That is quite possible.

46,858. *Sir Ganga Ram*: But is it not a fact that they themselves consider it a mark of respect to do these duties for Government?—Undoubtedly, but at the same time they constantly plead being engaged in works such as those which I have mentioned, and in consequence they do not do any farm, with of course some pleasant and marked exceptions.

46,859. *The Chairman*: I judge from your remarks on page 8 in answer to Question 17, that you would prefer to see an attempt made to employ the idle time of cultivators on the land rather than in subsidiary and spare-time occupations. Do you think they could profitably and usefully employ all their leisure on the land?—I think so.

46,860. Is there a tendency to look down upon spare-time occupations in this Province?—I think not. This Province perhaps has got quite an unusually large supply of work other than farming. There is a great amount of basket-making, rope-making, carting, etc.

46,861. On page 9 in answer to our Question 18, you say: "There is a great shortage of settlers and labour on the new Upper Swat Canal . . ." ?—Yes.

46,862. Largely, in your view, because landowners do not offer sufficiently attractive terms to tenants?—That is my view; the work on new land is pioneer work.

46,863. Does it mean reclaiming scrub jungle?—Not exactly reclaiming jungle, but the levelling of fields, adapting them for irrigation: the conditions that usually apply to new work, pioneer work.

46,864. Would there be an opening for steam tackle, at any rate, in the pioneer work?—I really do not think so.

46,865. What does it amount to, breaking up difficult land or simply ploughing for the first time?—The land is not difficult; the great difficulty is in getting it level and perfectly adapted to irrigation.

46,866. That is to say, terraced to some extent?—Yes.

46,867. And *bunded*?—Yes, and all that pertains to adapting land to irrigated cultivation. It has to be made to acquire fertility; it is not all fertile and ready to receive the best crops.

46,868. *Professor Gangulee*: Is it all virgin land?—More or less, yes.

46,869. *The Chairman*: Will you turn to Question 19, page 9, where you say that the forests on the hills are fully and suitably used? Does the Province ever suffer from fodder famine?—No.

46,870. You do not lose important numbers of cattle through shortage of fodder?—I have never heard of such a thing.

46,871. Do the military authorities purchase important quantities of hay and preserved fodder in the Province?—Very extensively, especially *bhusa;* that is wheat chaff.

46,872. In your view, does that purchase tend to raise the price of *bhusa* and other feeding stuffs to the cultivator?—To a very small extent.

46,873. You do not regard that as an important factor?—No. They save enough for themselves.

46,874. We have before us your separate note* on marketing to which you refer on page 10, in answer to our Question 20; I judge from that note that it is your view that it would at this stage be extremely difficult to organise sale societies on a co-operative basis amongst the cultivators; is that your view?—It would not be so difficult in my opinion if co-operation were established; then the matter would be easy; but co-operation does not exist at present.

* See Appendix on page 152 A.

46,875. There is a possibility in the future that it may be feasible?—I think so.

46,876. But in the meantime would you seek to introduce your credit societies first?—Yes.

46,877. What is your own view as to the reasonableness or the reverse of the charges made by middlemen for the service which they give, in other words, the margin upon which they operate?—I have never observed that it is very exorbitant; it is fairly reasonable in view of all the circumstances; the difficulty of dealing with little lots.

46,878. To what extent have you personally studied the fruit market and the possibility of extending that market?—I have visited the more important fruit markets in India, and I have studied the markets in South Africa, the manner of exporting and the manner of gathering the fruit.

46,879. Have growers in this Province been able to get into direct touch with hotels and large organisations of that sort?—No, I hardly think that is feasible.

46,880. You would make any attempt of that sort, in the face of very fierce opposition from the local dealers, I suppose?—Yes; and, besides, the fruit growers are so ill acquainted with that which is best in marketing that they are more or less dependent on the agents in Calcutta. Very good faith exists between Peshawar and Calcutta and Bombay; the men in the markets of Calcutta and Bombay are to agreat extent Pathans, men of this part of the world. They trust one another very freely and adjust the bills very nicely.

46,881. What is the method as a rule?—Commission sale; the bamboo baskets, or whatever they may be, are put on the rail, and the men at the other end auction them and dispose of them.

46,882. Are they packed and sent by rail to Calcutta by the grower in the North-West Frontier Province at his own expense?—No, the grower in the North-West Frontier Province hands them over to a dealer in Peshawar who has intimate business association with the man at Calcutta.

46,883. Even the large grower?—There is no really large grower in the Province.

46,884. So that as the first intermediary you have your dealer in Peshawar?—Yes.

46,885. He collects?—Yes.

46,886. Does he also to some extent grade and select?—In a moderate measure.

46,887. And he packs?—Yes.

46,888. And rails to Calcutta?—Yes, or wherever the fruit may go.

46,889. Does the Peshawar dealer purchase outright?—He purchases the orchard as it stands; he puts his own chowkidar in the orchard when the fruit is approaching ripeness.

46,890. What is the earliest stage at which the fruit is bought?—The orchard may be bought for its life; that is to say, it might be bought for five or more years; a dealer in Peshawar will buy it for five years.

46,891. But when it is bought by the year, is the crop ever bought when the fruit is first set?—It is bought very often when it is in blossom. The circumstances forcing the early sale are mostly debt; if a man who has got an orchard requires money he sells it to the dealer.

46,892. In your view, is the market capable of being extended to any important degree?—I think so; there is a very big opening for really good fruit.

46,893. What do you grow in this Province in the shape of soft fruit?—Peaches, plums, apricots.

46,894. A certain amount of grapes?—Yes, most excellent grapes.

46,895. Anything else?—Quinces.

46,896. All soft fruit?—Yes; pears, too.

46,897. Do you grow apples?—No, very, very few apples.

46,898. Do you grow citrus fruit?—To a very small extent; the Punjab can grow citrus fruits better than we can, and, as there is no hope of an export trade, they are not very extensively planted.

46,899. Are you growing any hard fruit at all?—Pomegranate, walnuts to a small extent.

46,900. Is that at all important?—The walnuts produced within the border are not very important, but there is a very large trade across the border in walnuts passing through the Province.

46,901. Is that produce going overseas or is it entirely consumed in India?—I think it is confined to India.

46,902. So that, in the main, you are concerned here in the production and marketing of soft and highly perishable fruit?—Yes, that which we can grow best.

46,903. In the meantime is it the case that refrigeration is not being used to preserve these fruits?—Yes, it is not being used. I studied that in South Africa, and the conclusion I came to was that refrigeration is hardly necessary; ventilated vans serve the purpose. If it were possible to fill a van with really first-class fruits at Peshawar and open it at Calcutta, all would be well.

46,904. At what season of the year is the peak of your peach production?—July.

46,905. A hot month?—Yes.

46,906. And yet you can rail those peaches in good condition to Calcutta or Bombay?—Yes, provided they are not disturbed *en route*. I may add that the peach and plum season begins on the 15th May and ends on the 15th August.

46,907. Are there many complaints about pilfering?—No.

46,908. What, in your view, is the smallest orchard which is likely to prove remunerative?—A 4-acre block would warrant a man skilled in the work undertaking it.

46,909. Is that a whole-time job for a man and his family?—Yes, very much so.

46,910. And that is the smallest unit you recommend?—Yes, to employ a really skilled man who is going to do it in a business way.

46,911. You are firmly of opinion that a few trees to employ the spare time and eke out the exiguous means of the very small cultivator are not to be recommended?—That is my view.

46,912. Can you tell us the area under fruit in the Province?—I have not got it now; I will reply to that later.*

46,913. And give, at the same time, a statement of the area under other crops?—Yes.†

46,914. *Sir Ganga Ram*: And the yield per acre under fruit?—Yes.‡

46,915. *The Chairman*: What is your own view of the present prospects of co-operation? You have, I think, a forward movement in being at the moment?—Yes.

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* 12,000 acres approximately.
† 1,620,000 acres approximately.
‡ Not received.

46,916. And that has been running for about five years?—I think not more than two.

46,917. Is it making headway?—Progress is very slow, but, as far as one can judge, fairly satisfactory; but it is in Hazara.

46,918. On page 10, in answer to our Question 23, you give rather a gloomy picture of the educational system in the Province; you say: "On all the fields of the North-West Frontier Province there may not be a dozen boys able to read or write"?—I am afraid that is true. There is such a demand for men with a little education in the Police and in the Army that the educated all go to these services.

46,919. With regard to cattle improvement, how many bulls have you at the moment registered and approved?—Three in service; we have many young bulls, and eight or nine young heifers, with a herd of cows.

46,920. Where are these three bulls situated?—They are at Tarnab; we have no bulls out in the district; they are for local service around Tarnab alone.

46,921. You have not been able to get out into the districts any bulls of approved breed?—That is done at present entirely by the Veterinary Department.

46,922. Do you know how many bulls they have out?—I cannot say.

46,923. Do you take an interest in sheep farming, or is that under the Veterinary Department?—Under my Department.

46,924. Do you think there is a future before sheep farming in the Province?—A most excellent future; sheep farming is not badly done at present.

46,925. Can you give us an idea of the extent of that industry at the moment?—No, I can not.

46,926. Can you estimate the sheep population?—No, I cannot do that.

46,927. Does all the wool come out from this side of the Province?—Yes, the wool mostly comes to Peshawar and is marketed there.

46,928. Do you know at all the quantity or value of the wool that comes through Peshawar?—Yes, the average fat-tailed sheep yields perhaps a pound and a half twice a year; that is 3 lbs. a year.

46,929. Do you know, at all, the total value of the wool passing through Peshawar?—No.

46,930 Do you think it likely that the breeds of sheep could be greatly improved without loss of vigour?—Yes, I am perfectly convinced great improvement can be made; we have been working on that for the last 10 years.

46,931. Do you put out many rams?—Yes, about 50 or 60 rams; that is to say, the rams are sold to those who wish to purchase them.

46,932. Do you think that effort is on a sufficiently large scale to make an appreciable improvement in the breed?—I think we ought to be bolder now; until now we have been more or less fixing the type that we like.

46,933. Has it been a question of selecting indigenous varieties, or improving by a cross introduced from abroad or from other parts of India?—We are improving the indigenous variety, which is excellent, by using rams of the same breed from Bagdad.

46,934. Has the Merino cross produced an animal capable of withstanding climatic conditions?—The only Merino cross in the Province is away up in the hills.

46,935. And they are doing well as far as you know?—They are doing moderately well, but the test is on a very small scale; if we are going to make any marked difference, it will have to be taken up much more boldly.

46,936. Sheep is a subject which is divided between you and the Veterinary Department?—I breed sheep because sheep may suitably run on the farm; sheep are kept by very many all around me. The Veterinary Department are dealing with sheep in the hills.

46,937. *Sir Henry Lawrence*: What is the distinction? How much of the work is under you and how much under the Veterinary Department?—The only flock of sheep in the Province is on my farm, and it is the fat-tailed breed which is confined more or less to this part of the Province. It is the custom almost everywhere in the district to keep a certain number of sheep, and especially in the Peshawar Valley; little flocks run hither and thither over the arable land.

46,938. *The Chairman*: I think that you carried out an enquiry into the economics of some 30 villages, did you not?—Yes.

46,939. In the Peshawar District?—Yes.

46,940. Were those results ever put together in printed form?—No.

46,941. *Professor Gangulee*: Are they going to be printed?—No

46,942. *The Chairman*: Have they been put together in typescript?—Triple carbon leaf copies were taken; that is all. The enquiry was entirely for our own guidance as a department and from an agricultural point of view.

46,943. Have you any agricultural teaching in the middle schools in the Province?—In a very small way at Nowshera. Agriculture is a subject permitted in what they call the University Entrance Examination.

46,944. So that that is in the Anglo-vernacular middle school?—Yes.

46,945. Have you any purely vernacular middle schools?—I am not aware of any.

46,946. *Sir Henry Lawrence*: On page 8 you say that the average cultivators "might be profitably employed if they had hope, enterprise and ambition." What is the difficulty there? Why have they not got these qualities?—Farming without capital leads nowhere; a cultivator leases his land from the landholder; he has got no capital; he is, shall we say, on half share; there is no hope of making anything on that; that is the leading difficulty: lack of capital. Lack of capital results in lack of hope.

46,947. But he can obtain a lease for a long period?—That is somewhat difficult. It is very unusual.

46,948. Ordinarily, is he an annual tenant?—I think the lease is perhaps more frequently for three years.

46,949. That is the custom?—Yes, three years is the custom; but it is hardly correct to say that there is any custom; each landlord makes his own arrangement and the tenant, on the other hand, is inclined to take the most he can from the land and get out as quickly as he can to another area; he moves about very very freely.

46,950. Would you say insecurity of tenure was a greater handicap than the lack of capital?—No, lack of capital is the great trouble. I quite believe if a landlord found a tenant who had capital, the latter would get a lease for a considerable length of time.

46,951. There is nothing to prevent his getting it?—Except the lack of capital.

46,952. *Sir Ganga Ram*: Is this poor cultivator, who lacks of capital, better off since the passing of the Land Alienation Act, or worse?

46,953. *Mr. Calvert*: The Act does not affect the tenants.

46,954. *Sir Ganga Ram*: I want to know about the poor landed proprietors; has their condition improved with regard to capital since this Act has been passed?—I do not think it has improved.

46,955. Has it become worse?—I believe the tendency is that way.

46,956. His credit has gone down?—Yes; he has less facilities for borrowing.

46,957. Since the Act has been passed, are the rich cultivators more given to moneylending?—The rich cultivator does not make a practice of lending money, but by the Land Alienation Act he is better able to acquire land.

46,958. But does he not employ his spare money now in moneylending?—I am afraid there are very few landholders in the Province who have any spare money. They are about as much in debt as the tenants themselves.

46,959. Not all?—No, there are exceptions.

46,960. I am informed that one Nawab is lending money on a very large scale; is that right?—I do not know.

46,961. On unirrigated land, if there is a small stream passing through the land of a cultivator, can he put in a pump without any permission from Government?—Yes, as far as I am aware; all along the hills everybody is doing that.

46,962. Is there any regulation about it?—I am not aware of any.

46,963. Is there no law to protect the interests of the people at the tail end of the stream?—I do not know, but I certainly know that a man down the hill would take care that his water was not cut off; I am not aware of any law.

46,964. You do not know of any rules by which cultivators are prevented from taking away too much water?—No. I am not acquainted with the rules.

46,965. Is any attempt being made to afforest these barren rocks on this side of the border?—There is a scheme with that in view.

46,966. Under what department is that scheme?—It would be under the Deputy-Commissioner, guided by the Forest Officer.

46,967. You are not aware of the details of that scheme?—No, it is beyond my province.

46,968. Is the idea to terrace them?—I should think not: I should think the idea would be to establish that which could be most easily established.

46,969. By terracing could not you make grass grow there?—No, I do not think terracing would do that; that is a very big thing; the best plan would be to establish wild, free-growing, hardy, drought-resisting trees and shrubs.

46,970. And by bunding them across?—The scheme which should be first established should be independent of water; things can be found to grow without water.

46,971. I know you have given a great impetus to horticulture; but agriculture is also in your charge, is it not?—Yes, agriculture is my primary charge; fruit takes about fourth or fifth place in the department's scheme of work.

46,972. You have got one farm at Tarnab?—Yes.

46,973. What is the actual expenditure on that farm?—Rs.40,000 a year, being the headquarters for the Province; it is an experimental station. The actual average expenditure is Rs.40,000 and the income in each of the past three years nearly Rs.33,000.

46,974. Then there is only a loss of Rs.7,000?—Approximately, on the farming, apart from staff; that is, my own pay and the pay of the assistants employed.

46,975. That is the only farm you have here?—No, we have a second in Hazara which is a small place.

46,976. Are you aware of any hydro-electric schemes here?—Nothing that has gone through; I have heard them frequently spoken of.

46,977. Have you any scheme in view to utilise the great fall of Malakand? —No; looking far far ahead, I should like to have sugar-beet factories helped by this scheme; but that is a long way ahead.

46,978. Has no scheme been thought of by the Irrigation Department?— The question has been frequently considered, but nothing has resulted so far; the difficulties seem to be almost insurmountable at present.

46,979. You speak of a Pusa No. 4 wheat; have you tried Punjab No. 8? —Yes.

46,980. Has that been successful or not?—No.

46,981. You prefer Pusa No. 4?—Yes.

46,982. Are you aware of any natural deposits of manure here?—They exist just across the borders in some caves, and there are many hills, the sites of old villages, which are rich in salts; they are liberally used.

46,983. Are there any in such a condition that you could take them across to other places?—It is the common practice; the hills are disappearing. I imagine nitrate of potash is the useful constituent of the manure.

46,984. When you say drainage would be better than waterlogging, what is in your mind as the system of drainage that you propose?—Liberal irrigation with adequate drainage.

46,985. Drainage into what? Has any scheme been thought out as to how the water is to be drained?—That is what I suggest might be done, to a greater extent than now, by efficient drains.

46,986. Has no scheme been worked out for that?—Yes, there are certainly schemes; I think the Irrigation Officer will be able to tell you exactly what is proposed.

46,987. I am surprised to hear that your system here is one of sowing wheat after maize; in our colonies wheat after maize is only put in as a sort of catch crop, not as a regular crop?—It is common practice here.

46,988. Does it give a reasonable yield?—Most excellent; we dare not grow wheat as one crop a year; it would lodge.

46,989. Do you grow cotton?—No, it is not profitable.

46,990. But Peshawar cotton fetches a very high price?—Yes, but that is grown on a very limited area of land; when I say we do not grow cotton, the area is, say, 30,000 acres compared with a million acres of wheat.

46,991. But what other crops do you grow?—Sugarcane, 40,000 acres; chillies, probably nearly 20,000 acres; maize, 500,000 acres, etc.

46,992. Is there any system here of giving so much water per gross area? —Yes, the supply is very, very liberal indeed; naturally, as I say, because there are maize, chillies and sugarcane, all intensive crops. The cropping is very intensive in the valley.

46,993. Have you observed the delta of water required to irrigate each crop?—No.

46,994. The Irrigation Department have got that information?—I think they will have it.

46,995. They must communicate that information to you; it is most important information?—The water really is very abundant in the Peshawar valley; where it is at all available, it is scanty.

46,996. Are you aware of the researches made into waterlogging in the Punjab by Professor Wilsdon?—Yes, I have visited his farm and have had visits from the Punjab officers on the subject.

46,997. Did you agree with some of the results?—Yes, I entirely agreed. I did not, however, like mole drainage.

46,998. In this Province are there any Crown lands belonging to Government?—Nothing to speak of.

46,999. You speak of artificial manures in your note; what artificial manures do you use?—Superphosphate chiefly; our soils are lacking mostly in phosphates.

47,000. Do you use bone meal?—No, superphosphate.

47,001. Do you import it?—It comes from Calcutta.

47,002. From Messrs. Shaw Wallace?—Yes.

47,003. At what rate is it delivered here?—It may land here, I believe, at Rs.10 or Rs.12 per 100 lbs.

47,004 You use that only for sugarcane?—No, I use superphosphate for chillies and fruit.

47,005. How much do you use per acre?—I should never think of using more than 200 lbs. per acre.

47,006. *Professor Gangulee*: That is what you use in your own farm? —Yes; when I speak of artificial manures, I am speaking of my own farm entirely: the cultivators do not know it or use it.

47,007. *Sir Ganga Ram*: How long does the effect last?—I have observed the effects of superphosphate on a crop up to 3 years.

47,008. You do not use bone meal here?—No.

47,009. Why not?—It is slow in action, and if we must pay carriage, we had better pay it on that manure which is most concentrated.

47,010. Is any bone meal exported from here?—Bones are exported, but not meal.

47,011. They do not make meal?—No, meal is not made.

47,012. Would you prefer to stop that export and keep the bones here? —If we knew of an easy method of converting bones to phosphate, we should be very glad.

47,013. Mere bone meal made very fine has an immediate effect?—Yes, but it is difficult to get it in a finely divided state.

47,014. There is no well irrigation here?—There is in certain parts, and even where canal irrigation is practicable the well is sometimes preferred.

47,015. How far down is your water-table?—It varies a great deal; it may be anything from a foot to fifty feet.

47,016. Have tube wells been tried here?—Yes, and they have been very successful, but for municipal purposes only, not for agriculture. They have been tried for agriculture also, but they were not profitable.

47,017. Can you say what discharge they give?—No. I have watched them many times, but I have not endeavoured to take the discharge.

47,018. On page 3, you say *taccavi* may be given "to relieve distress in agricultural misfortune." What do you mean by that?—If a man has a disaster either to his family or his crops.

47,019. Is *taccavi* given for that?—I believe so. It is certainly given in the case of disaster to his crops.

47,020. I thought *taccavi* was intended only for land improvement?—I believe it is given for these other purposes also.

47,021. You say that wide areas of land are being put out of cultivation by seepage. You mean seepage from canals?—Yes, and from the excessive use of irrigation and so on.

47,022. That would be waterlogging; the term "seepage" is specially applied to seepage from the canal banks?—Yes, but both have the same effect and result in waterlogging.

47,023. Has pumping the seepage back into the canal been tried here?—No.

47,024. You know that we are doing it in the Punjab?—Yes.

47,025. Are you trying new implements like the Rajah plough here?—We have tried numbers of implements, but the Rajah plough is the only one we urgently want.

47,026. That is on your farm here?—Yes.

47,027. What about the cultivators? Do they use harrows?—No.

47,028. You have abundant water?—Yes.

47,029. That is the reason why they do not care about it?—Yes. The water takes the place of cultivation.

47,030. *Sir James MacKenna*: I understand that in this Province *berseem* seeds?—Yes. In a good season it will give 500 lbs., and in a bad season about 200 lb. per acre. The demand for it in the Province is so great, however, that we have none to export.

47,031. It is very important from the point of view of other Provinces, because it does not seed there?—It is spreading rapidly here.

47,032. Do you give technical training in improved methods of agriculture on your Tarnab farm? Are you training any cultivators there?—Of the fifty men who are more or less constantly employed there, nearly all are under training. There is no scientific training; our great aim is better workmanship.

47,033. You refer to the labour employed on the farm?—Yes.

47,034. Will these men go back and cultivate themselves?—Yes. Almost all of them own a little land.

47,035. How long do they stay with you?—3 years, though some stop 5, 7 or even 10.

47,036. They go back and cultivate their own land thereafter?—Yes.

47,037. Do you regard them as useful propagandists?—They are excellent for that purpose.

47,038. Is the home farm idea developing at all here?—I am sorry to say that, though there are one or two, I cannot say it is developing.

47,039. Have you seen the large grant farms in the Punjab, such as Mr. Roberts's?—No.

47,040. Has that system occurred to you as a possible way of developing waste lands in this Province?—There is practically no waste land here. There are big holdings, but the cultivators would certainly not consider they were waste land.

47,041. With regard to sugar-beet and sugar production, have any commercial proposals for factories been made to you by firms out here?—After the Sugar Commission's Report, Tata's expressed their willingness to do

something; they thought the conditions were fairly satisfactory. They found them otherwise elsewhere, however, and therefore they did not come here. I happen to know that a sugar-beet-*cum*-cane factory has been started in Louisiana; it was working last year.

47,042. You are in a position of magnificent isolation here?—Yes.

47,043. You say very definitely you consider the way to tackle your problem is to introduce modern methods of agriculture rather than to spend much time on research?—Yes.

47,044. By that you mean crop selection and so on?—Something more profound than that, perhaps; any Province can do crop selection.

47,045. Whom do you rely on most?—Pusa.

47,046. Have you found Pusa of definite help to you?—Yes; we could not carry on without Pusa. We see the experts in chemistry, entomology, botany, etc., almost every year. They help us in all research matters.

47,047. Do you think there is any possibility of your staff being extended to any great extent? I imagine finance is the limiting factor?—Yes. We are trying to get over that by becoming self-supporting as far as we can, and we hope to attain that position this year or next.

47,048. Assuming you can put that very cogent argument before Government and are able to expand somewhat, what will you do?—I would like to see a demonstration farm in each district.

47,049. You do not want to have a superior staff; to have a botanist and a chemist, for example?—No. There is more to be done in the way of getting better workmanship.

47,050. That is the line you recommend if and when your Government is in a position to finance further developments: an expansion of demonstration farms?—Yes.

47,051. Have you a definite scheme for the expansion of your staff, or is that adequate?—No, that must follow our becoming more or less self-supporting, unfortunately.

47,052. Have you any definite method of training?—We have a definite scheme sanctioned by Government, by which men will come for two years' training and go through the various branches. They will do ordinary work as labourers, but on three afternoons a week they will be told what they have been doing in a more or less scientific way by a trained Assistant. That scheme will probably begin this month. The men will then be sent out to various landholders. The landholders are being asked to send their men in for training.

47,053. I was thinking more of your own staff, of the men you will put in charge of propaganda work in the districts?—My highest scheme would be for men to have a year at Pusa after passing through Lyallpur and having gained experience with us at Tarnab.

47,054. Would he have sufficient knowledge of English to profit by that training?—All we have had are fluent in English.

47,055. *Professor Gangulee*: You have just told us that you have a certain number of men working on your farm who would be useful as propagandists. Are they literate?—No. By propaganda I mean that they will show by their skill in the field what they are capable of doing.

47,056. They are chiefly recruited from the villagers themselves?—Yes, who are nearly all illiterate.

47,057. Are they already out in the villages?—Except for the men in charge of cattle, we have no men living on the experimental station. They go nightly to their homes.

47,058. They do not farm their own land?—Their brothers will be farming, and they help them and come to us in their spare time.

47,059. You have a number of Agricultural Assistants?—Yes.

47,060. What are their qualifications? How were they trained?—I have two who have taken what is now the four-years' course at Cawnpore, and four who are two-years' course men from Lyallpur.

47,061. Do you find them satisfactory?—Yes, they are excellent men.

47,062. Are they cultivators themselves?—They are of agricultural extraction in the strict sense of the term; they are all village born, with one exception, and he is nevertheless very good.

47,063. What definite improvements in agricultural practices have you observed in this Province in the last 20 years?—I see no marked improvement in the practice, but I have travelled over a great part of India many times, and the practice here is, on the whole, better than I have seen anywhere else.

47,064. Are there any improvements due to your department, such as the introduction of better seed and so on?—Yes, there is Pusa 4 wheat, which we got from Pusa, and which has been propagated from a maund of seed to sow 200,000 acres in under 10 years.

47,065. When you refer to new varieties of staple crops, have you in mind only one such crop, wheat?—No, there is also maize. That is not an improved variety, but a selected variety of that which the cultivators themselves have long had. I have tried all the world over to get a better variety than we have, but have not been able to find one.

47,066. You refer to a soil-inversion plough. Is that in favour here?—No. The holdings are too small for it to be used profitably.

47,067. What are the chief money crops in this Province?—Sugarcane and chillies; especially the former.

47,068. They are exported, I suppose?—Yes, the *gur* goes to a large extent to the Punjab, and the chillies are exported from the Province almost entirely.

47,069. I understand, from your note, sugar-beet has done exceedingly well under irrigation on your experimental farm?—Yes.

47,070. Are you continuing that experiment?—Yes, and I hope to be able to show you bountiful crops to-morrow.

47,071. What is the prospect of sugar-beet being introduced on a large scale?—As far as I can judge, I do not think very much white sugar will ever be made in India from cane, because the water is lacking. That is the great trouble. On the other hand, beet does not require much more water than wheat, and the roots can be grown wherever wheat is produced.

47,072. *Sir Ganga Ram*: Does it not require ploughing to a great depth?—That does no harm, but it can be grown without that. Even if depth were essential, it is just as possible to plough deep in India as at Home.

47,073. Could such deep ploughs be worked by your animals?—Yes, they pull the Rajah plough, which everyone ought to have.

47,074. But are the animals strong enough for this deep ploughing? Would it not require steam cultivation?—The better animals can manage the Rajah plough very well. People who were advanced enough to take to sugar-beet, however, would probably have animals which were good enough.

47,075. *Professor Gangulee*: Is there any scope for long staple cotton in irrigated areas?—Our Tarnab farm has grown long staple cotton for the best part of seven or eight years, but the bolls do not open; they do not

ripen. I am going to Lousiana and Georgia this year to see why we cannot grow it.

47,076. Is it the seasonal difficulty?—We have a longer and hotter season than they have in Georgia, but our bolls do not open.

47,077. For how long have you carried on this experiment with long staple cotton?—From 1910 to 1919.

47,078. Have you published the results of your experiments?—We have published almost nothing; I am alone here.

47,079. Do you see any sign of the landowners of this Province maintaining home farms?—I know of one which is very well run indeed, and there are several others in contemplation.

47,080. Generally, I understand from your note, they are not very keen?—That is so.

47,081. What is the difficulty?—They are engaged in another world, in Government work. The fact is that, like other people, they want to get away from the villages to a brighter life.

47,082. It is the attraction of town life which is chiefly responsible?—Yes, the need for society; the need to be where others are.

47,083. Do the landowners in this Province visit your experimental farm?—Yes. Not so many landlords come there as I would like to see, but cultivators come every day; we have a stream of visitors all the year round.

47,084. Is there anyone there to explain things to them?—There is an excellent manager, and I am there fairly constantly myself.

47,085. Are the results of your experimental station published in the vernacular?—No. We have not published enough.

47,086. On the first page of your note you say that the appointment of experts to administrative offices is retarding progress in agricultural science. What exactly do you mean by that?—I would rather see an eminent botanist remain an eminent botanist or an eminent chemist remain an eminent chemist than become an administrator.

47,087. You say the Veterinary Department should be under the Director of Agriculture. Why?—The members of the Agricultural Department are dealing with cattle every day of their lives; their acquaintance with animals is, I believe, more intimate than that of a man who only deals with them from a veterinary point of view.

47,088. In answer to our Question 16 (*a*) (i) on page 7, you suggest that Government should refrain from imposing duties on landholders. What are you referring to there?—I think perhaps the time is coming when Government will be able to carry on its work with less aid from landholders than has been required in the past.

47,089. What is the nature of these duties?—Every little official requirement or duty is thrust on the landholder. It is, of course, their deliberate wish and aim to be as much employed in Government work as possible.

47,090. You say that small orchards are rarely remunerative, and that 4 acres is the smallest that will pay?—That is the smallest for a commercial orchard which can send fruit to Bombay and elsewhere.

47,091. What is the average area the cultivators have?—A man may have ½ acre.

47,092. An area of 4 acres is, in your opinion, the economic unit?—Nothing smaller will warrant him putting money and skill into it.

47,093. Is not there a good deal of trade in dried fruit between Peshawar and Calcutta?—That does not affect our cultivators here; it simply passes through.

47,094. *Mr. Calvert*: You have tried Federation wheat here?—Yes.

47,095. Was that a failure?—No. If I were farming on my own account I would grow no other; but it requires good cultivation.

47,096. I believe it failed when tried in Attock?—Yes.

47,097. Was that due to bad cultivation?—Possibly; possibly to the land being rather poor. If I were going to farm myself I should have the land in high condition and grow Federation.

47,098. You are inclined to try the introduction of exotics from overseas? —Yes.

47,099. Do you think that is a good line to take?—Federation is an excellent example of a good exotic wheat, and some of the other wheats now in favour may also be exotics. Sugarcane exotics do well; our best cane is an exotic.

47,100. We have been told that the Punjab 8A and 11 are better wheats that the Pusa 4, which is not suitable to this climate?—That may be true of the Punjab, but they are our worst wheats here; they will not stand up.

47,101. Has there been much expansion of tobacco cultivation here?—The tobacco grown here is for the Pathan *hookah*; it is not cigarette or pipe tobacco.

47,102. Have you done any work on tobaccos?—We do a little.

47,103. What tobacco do you grow?—The tobaccos we have received from Pusa and from America grow admirably; first-class cigarette tobacco could easily be grown here. There is actually a big import of tobacco from the frontier to the Punjab at the present time.

47,104. The Punjab people complain that the expansion here is killing their trade?—Yes.

47,105. Is that due to improvements which have been introduced?—No. Tobacco is a crop which is only a short time on the land and which is very profitable. In the Punjab, moreover, there is a disease called *orobanche* which we have not got yet.

47,106. You speak of artificial manures being profitable. Do you mean profitable in an economic sense, in that you recover more than the cost of the fertiliser?—Yes. The profit at the experimetal station is considerable, but all the farmyard manure we can possibly collect at Tarnab would suffice for only 40 acres, and we have 180 acres.

47,107. Do you find these artificial fertilisers profitable even with wheat? —Yes.

47,108. When you say damage is rarely done by animals, do you mean to say your fruit crop here is rarely damaged by animals?—There is usually a man in the orchard in a *machan* to keep pests off.

47,109. Do you not have flying foxes and so on?—Hardly any.

47,110. Have you actually made sugar from beet?—No. For a month or so over the the greater part of 10 years a chemist has been deputed to us from Pusa to determine the beet sugar content, which is the important point.

47,111. But actually sugar has not been made from your beet?—No.

47,112. You say the measures to exclude external pests are adequate. Are there any measures to exclude external pests from Afghanistan?—No. I am speaking there of places like Bombay, where there are big imports.

47,113. You say poultry-keeping can hardly be profitable. Do you mean to say there is no scope for poultry-keeping with English breeds amongst all these cantonments?—With the people in cantonments it might be better

to have English varieties, but that is a small matter compared with the number of people who keep fowls in villages. The cantonment people can get their eggs at three or four annas a dozen, but they would have to be charged about Rs.1.8 a dozen for English eggs.

47,114. Would not people in the cantonments be prepared to pay a higher price for English eggs and poultry?—I have no experience, but I am confident they would not pay so great an increase as I have mentioned.

47,115. You regard it as unnecessary to make an economic survey of an entire village, but unless you do that how can you find out what is your typical small farmer?—If I know what he makes out of the crops he grows I can tell what it costs him to live.

47,116. How can you tell what is typical unless you examine them all?—If I knew what his crops produced, knowing the majority of these people are able to live on eight to 10 annas a day, it would be fairly easy to come to a conclusion.

47,117. Are you not beginning at the wrong end?—I do not think so.

47,118. What do you call the typical small farmer?—A man with five acres, of which one will be under sugarcane, one under wheat and so on.

47,119. Five acres is typical for this tract?—Yes. With five acres he may make Rs.500 a year, Rs.100 per acre. Few do better.

47,120. *Sir Ganga Ram*: Do you mean he makes Rs.100 an acre from sugarcane?—No, but with all the crops he grows it works out at Rs.500 for five acres, or Rs.100 an acre.

47,121. *Mr. Calvert*: That is for irrigated land?—Yes.

47,122. You say you found tenants were generally in debt to their landlords. Does that debt influence the period of their tenancy?—Yes, it binds them to the land. They cannot move away so long as they are in debt.

47,123. You informed the Chairman that tenants changed, roughly, every three years. Is that based on a careful scrutiny of revenue records field by field?—No. I am not in a position to scrutinise revenue records, but I am constantly in the fields.

47,124. You have not tested whether individual fields are cultivated for anything approaching three years or more?— No, except that I am constantly in the fields and am acquainted with individuals for miles around.

47,125. In the case of small holders, you are inclined to exclude small animal husbandry like poultry-keeping and you also exclude fruit. What is he to do?—I exclude them as a business apart from anything else. By all means let them take to poultry as a subsidiary occupation, but not to fruit. There is no place for fruit cultivation on such a scale; it would mean a loss rather than a gain.

47,126. Do you know of any country where small holders have been able to make a decent living except by animal husbandry and horticulture?—No, but every country I can think of is in a more advanced state agriculturally than India.

47,127. Have you studied Sicily or Southern Italy at all?—No, I have not been on the continent of Europe.

47,128. What hope do you hold out for the improvement of the condition of the small holder in this Province?—Bigger holdings. I would begin with the landlords. Let the landlords farm themselves, and gradually get men with capital to take up farming. A man without capital cannot farm; small holdings are hopeless.

47,129. You would reduce the present cultivator to a farm labourer?—I would rather he was a well-paid farm labourer than a small and debt-stricken tenant.

47,130. In your inquiry in these villages, did you discover the existence of a landless tenant class?—Yes, not only in the area of my inquiry, but it is common all round about. The landless man becomes a tenant and is financed by his landlord, and the landlord in his turn, unhappily, is sometimes in debt and is financed by the moneylender.

47,131. In the Peshawar district, you have about 80 families per square mile of cultivation. Of that 80, how many would be landless tenants?—I should think more than half.

47,132. That is not based on any actual count?—No, but thinking rapidly of the villages I know, I think about half the people are landless tenants.

47,133. *Mr. Kamat*: With regard to this economic inquiry into 30 villages, although you have published no report is it your opinion that such inquiries are of great importance in diagnosing the causes of indebtness and other factors?—Yes, I think such inquiries are important. The Settlement Officer is in the best position to make such inquiries accurately.

47,134. As a result of the inquiry you made, I expect you have come to certain broad conclusions?—Yes.

47,135. On that I want some further information. The small holder who is not in debt can make a living for himself and his family on five acres?—Yes.

47,136. You told one of my colleagues that the chief difficulty in the progress of agriculture is lack of capital for the tenant?—Yes.

47,137. Along with this factor there is another, viz., that you have here, the *batai* system?—Yes.

47,138. As a result of your inquiry you say: "On the rents now prevailing no farmer with capital, however enterprising and experienced he may be, can farm a reasonably big area of land at a profit." That is to say, even with capital but with this system of *batai*, or half-share, it is not possible for an enterprising and experienced man to make a profit?—That is so. It is not possible here to hand back a half share and live.

47,139. Supposing the agriculturist has capital available, but is on the *batai* system, will he be happier?—I think he would be happier as a contented, well-paid labourer than as a free man living from hand to mouth.

47,140. Which is the greater obstacle: the *batai* system or want of capital?—Want of capital.

47,141. That is to say, given the capital but keeping the *batai* system, the position of the agriculturist would improve?—They are very closely associated.

47,142. *Mr. Calvert*: How do you reconcile your statement that there is lack of capital with your other statement that they are in debt? How can there be debt without capital?—They are invited to cultivate a certain area and they have no capital, so the landlord finances them.

47,143. Then they have capital?—But the capital is not their own. As a result of getting their capital in that way they have to give a half share back.

47,144. *Professor Gangulee*: The landlord gives them the money to farm with?—Yes.

47,145. And takes it back on the *batai* system?—Yes. I think that is severe, but you cannot expect anything else.

Mr. W. Robertson-Brown.

47,146. *Mr. Kamat*: You say the tenant who gives half his produce as rent cannot live decently on five or even 10 acres?—I feel confident of that.

47,147. So far as this system of giving half the produce is concerned, it does not matter then whether the holding is five or 10 acres?—That is so.

47,148. In other words, the factor of the size of the holding does not apply and the factor of having or not having capital does not apply so long as the system of giving half the produce (i.e., of *batai*) is there?—I agree. The system of giving half the produce is too severe; it makes the rent too heavy.

47,149. That is, then, the most important factor in this Province; the system of *batai* is the greatest obstacle?—I would not say the system of *batai* that prevails elsewhere is necessarily so. In other parts of India there are variations of it; it may mean half the produce or it may mean only a third.

47,150. Can you suggest any system to solve this problem?—I would like to see the bigger man cultivating with capital and employing labour and paying his labour well, as they do in some other parts of the world.

47,151. The present situation, in your view, is this: the tenant is in debt because he pays half the produce?—Yes, that is one of the causes.

47,152. And yet the landlord is also in debt although he receives half the produce?—Yes, but the landlord starts in debt.

47,153. You say whether it is five acres or 10 acres does not matter so long as the half-and-half system prevails?—Yes.

47,154. Taking the proposal for a moderate cash rent, instead of *batai*, will that solve the problem of all the people concerned being in debt?—No; the landlord would have to have more capital. Those who have capital will be in the best position to carry out what I want to happen, and what is now very far away.

47,155. Your solution therefore would be bigger holdings, a cash rent system and more capital for the landlord?—That is exactly what I mean; that would be the great thing to which to aspire.

47,156. The size of holdings here has remained nearly the same during the last 10 years?—Probably.

47,157. The density of your population, although it fluctuates from district to district, is on an average the same? The pressure of the population on the land, I mean, is the same?—Yes.

47,158. The indebtedness also is there. I do not know whether it is increasing?—Yes.

47,159. What then about the improvements you say you have effected by better seed, better implements and better cultivation to relieve the situation both for the tenant and the landlord?—They will undoubtedly have some influence, and the adoption of such improvements as we are able to offer costs nothing.

47,160. But it does not relieve the position?—If you can add Rs.10 an acre to wheat in the North-west Frontier Province that will give Rs.10 lakhs a year, and that will go some way towards effecting an improvement, while the cost of adopting such improvements as we can suggest is either nothing or very little.

47,161. *Sir Ganga Ram*: Would not this cash system, if adopted in preference to *batai*, make the landlords absentee landlords?—No. My whole aim is that the bigger men should farm themselves.

47,162. If they employ tenants, which is the better system: *batai* or cash rent?—Cash rent is decidedly the better system. *Batai*, whether it be

half share or third share, rather binds a man. I would like to see the tenant pay his money and be done with it, as is the case in Scotland, for example.

47,163. Was not the cash rent system the cause of all the trouble in Ireland? The landlords took the money and remained in London?—That hardly applies in this part of the world. We have no London here.

47,164. You said in reply to Mr. Calvert there were 80 families to the square mile here. That means eight acres per family. What will be the effect of sub-division in the next generation?—I suppose it has been going on for a long time.

47,165. It will go on still further. The law of partition applies here, does it not?—Yes.

47,166. Would you lay down that a certain area should be indivisible?—I would not unnecessarily interfere; it is their own matter; I suppose they will have to adopt that which is found to be economically the best.

47,167. That will lead to very small holdings. Is the value of land appreciating or depreciating?—It is going down slowly, I think.

47,168. Is the yield also going down?—I think not; it is increasing and the quality is also improving.

47,169. Then what is the cause of the value of the land going down?—Because the Land Alienation Act closes down the market; the open market naturally puts up the value of the land.

47,170. How many times do you plough before sowing wheat?—About three times.

47,171. Will three times give you a good yield?—Yes; after maize I plough about three times.

47,172. And supposing it is not after maize?—If it is *ek fasli* wheat, that is, a one-year crop (and it is very rare indeed for wheat to be a one-year crop) I would give perhaps half-a-dozen ploughings, but that is on irrigated land.

47,173. How much seed do you sow per acre of wheat?—About 50 lbs., that is, 25 seers.

47,174. Is that broadcast?—On irrigated land it is broadcast, on *barani* land the seed may be 100 lbs., or 80 lbs., and it is then drilled.

47,175. On *barani* lands do you advise the people to put *bunds* all round?—It is invariably the practice to catch as much rainfall as there is; they put the *bunds* round more or less.

47,176. You advise them to do it?—As a matter of fact we have not worked very much on *barani* tracts. When I speak of *bunds* I mean more especially on parts like Dera Ismail Khan where flood water is caught by *bunds*.

47,177. Is the water table parallel to the slope of the country?—I could not tell you.

(The witness withdrew.)

KHAN SAHIB MOHAMMAD ASLAM KHAN, Honorary Magistrate and Zamindar of Mardan.

Oral Evidence.

47,178. *The Chairman*: Khan Sahib Mohammad Aslam Khan, you belong to the Peshawar district of this Province?—Yes.

47,179. You have not provided the Commission with a note* of the evidence which you wish to give before us. Perhaps you would tell us first whether you yourself own land?—Yes, I own land.

47,180. Would you tell us how much land you own?—A little more than 1,500 acres.

47,181. Of these 1,500 acres, how many do you farm yourself?—I have only 50 acres, excluding the gardening portion, there are three gardens comprising some 27½ acres.

47,182. Is that fruit-gardening?—Yes.

47,183. You have 50 acres of cultivated land, 27½ acres of orchard, and the rest you let out to tenants: is that the position?—Yes.

47,184. On the *batai* system?—Partly on the *batai* system, and partly on cash payment. By cash payment I mean lease money, the lease being for a limited number of years, from three to five or six.

47,185. What fruit have you planted in your orchard?—Peaches and plums as summer fruits, and oranges, Malta oranges and *sang taras* as winter crop.

47,186. Which is the most paying crop?—I should think Malta oranges, peaches and plums.

47,187. Do you market the whole of your fruit by selling it to an agent in Peshawar?—No, I give it out on lease to a person.

47,188. And he puts on his own chowkidars and he plucks the crop?—Yes.

47,189. You do the pruning, do you?—Yes, annually, and I provide the gardeners; in fact, I do everything in regard to agriculture myself.

47,190. On the 50 acres that you farm, what is your principal crop?—Wheat and barley as spring crops; maize and sugarcane as autumn crops.

47,191. Is it irrigated land?—Yes, it is irrigated by the Lower Swat Canal.

47,192. Are you satisfied with the supply of water that you are getting?—Yes; but sometimes during drought I am not satisfied; while it may also happen that we may get excessive rainfall, in which case we do not want water. On the last occasion the crops were destroyed by an excess of rain, and once before there was a scarcity of rain.

47,193. There are one or two questions that I should like to ask you. Do you think that the Agricultural Department might do something more in the way of demonstration?—Yes, if it is extended it can do much more than it is doing at present. At present we have got no Agricultural Department except the farm at Tarnab.

47,194. Of course that is only a beginning. But meantime do cultivators come from a distance to see the farm, or is it only the local cultivators who see it?—Anybody who takes an interest in agriculture, whether he lives far or near, will certainly come to the farm. Take my own case: I live about 35 miles away from the farm, and I pay three or four visits annually to see what has been done and what more I can learn from the farm.

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* The witness submitted a note subsequently (see Appendix to his oral evidence).

47,195. *Sir Ganga Ram*: Perhaps you have a motor car, whereas others have not?—No, I have no motor car.

47,196. Then how do you go?—By train; I come all the way from Mardan.

47,197. *The Chairman*: Do you use the Rajah plough on your own holding?—Yes.

47,198. Is that a success?—Yes.

47,199. Have your oxen difficulty in pulling it?—Yes, the average ox cannot work it.

47,200. Is there a veterinary dispensary in your locality?—Yes; there is one in Mardan tahsil.

47,201. Is that helpful?—Yes, but not sufficient for the needs of the people, because the Mardan tahsil comprises a very large area.

47,202. Are you a member of the local District Board?—Yes.

47,203. Does that Board maintain the dispensary in question?—Yes, the Board supplies medicines to the dispensary.

47,204. Do you take any interest in the management of the dispensary? Have you a sub-committee of the District Board?—Yes, but I am not a member of the sub-committee; at the same time the District Board has no command of the internal affairs of the veterinary hospital, which has its own officers. The District Board just keep up the building and provide the medicines.

47,205. Do you breed your own working cattle?—No, I generally purchase my cattle.

47,206. Do you keep any milch cows?—Yes, about four or five.

47,207. For your own use?—Yes.

47,208. You do not sell any milk?—No.

47,209. What do you feed those cows on?—On clover, green barley and *mote*.

47,210. What is your clover?—*Shaftal*.

47,211. Have you tried any *berseem* at all?—No.

47,212. Do you experience any difficulty in getting green food for your cows at any season of the year?—In the months of June, July and August we experience great difficulty in providing for the milch cow. Similarly, from the last half of November to the first half of February.

47,213. Have you tried making any silage?—No.

47,214. Do you know how to do that?—No, it cannot be done in the irrigated area.

47,215. You can store it above ground?—We have heard that in *barani* land it can be stored, but we do not know whether it can be done above the ground.

47,216. In irrigated land if the water level is too high you have to make a mound and then dig your pit, and you get the necessary degree of dryness; or you can build a tower. But you do not know about that here, do you?—No.

47,217. Would that method not be useful to you?—Yes, if it can be taught to us we will use it.

47,218. Have you any views about the future of co-operation in the Province?—Co-operative societies will certainly be a very great boon to our Province, especially to our district of Peshawar, which is comparatively more fertile and irrigated.

47,219. How do your tenants get their capital?—They generally get it from the village *sowcar*.

47,220. Do you ever provide your tenants with seed?—Sometimes, when I have got it in store I supply them with it.

47,221. They pay you back in seed, do they?—Yes, if I give them wheat they give me back wheat.

47,222. *Sir Ganga Ram*: Do you charge anything extra?—Not from my tenants; I have never charged them anything extra.

47,223. *The Chairman*: Do you think that there are many boys or young men at work in the fields who can read and write?—So far there have been very few examples of that type of man.

47,224. Have all the literate people gone into other employments?—Yes; if a man gets a post of tahsil chaprasi or that of a constable he will never look at agriculture.

47,225. *Mr. Kamat*: As a landlord, would you like to change the system of *batai* into that of cash rent?—Yes, in some cases cash rent is useful for the landowners; in some cases *batai* is profitable; in other words, wherever there is intensive agriculture, there *batai* is more beneficial to the landowners.

47,226. Why do not the majority of landlords like the cash system?—The majority like the cash rent system, because they are always hankering after Government employment and they cannot supervise their land, with the result that they lease it out.

47,227. So far as you know, are there many landlords who are not educated and yet do not live in their own villages?—I shall instance my own case. I belong to Mardan, and some of my land is situated in Mardan, but my estate is situated some 12 miles from that place. Every big landlord possesses some land in his own village where his forefathers lived, and at the same time a big piece of land is also possessed outside the village, probably a good distance away.

47,228. Is it the case that only educated landlords live in towns away from their villages, or it is also the case that uneducated landlords also live in the towns without going to their villages?—There are many instances in which landlords are found to live in towns instead of in their villages, and that is especially the case here in this Province, where life is not safe after sunset. In support of this statement I would refer you to the reply which His Excellency the Viceroy gave during his last visit to our Province to the address presented by the Municipal Committee, Peshawar, when he admitted that life was not safe outside the city walls, and therefore this fact set a limit on the expansion of the city. The situation regarding safety of life and property may very well be imagined out in the countryside.

47,229. *Sir Henry Lawrence*: You grow peaches?—Yes.

47,230. How long does your peach season last?—Generally for three weeks; I am talking about my own villages.

47,231. Your trees only give fruit for 21 days?—Yes, that is so.

47,232. Here is a statement which says that peaches gave fruit in Peshawar for 45 days formerly and now they give fruit for 90 days?—I have no experience of Peshawar City; my estate is situated some 30 miles from Peshawar.

47,233. Would it be correct to say that, through the advice of the Department, the length of the peach season at Peshawar has been increased from 45 days to 90?—Yes, the varieties which we have got from the experimental farm are more durable than the ordinary country peaches.

47,234. And that improvement has been shown to the cultivator by the department?—My own experience is that the peaches distributed by Mr.

Brown are far better and last many more days than the others. They can be sent to Calcutta and Bombay, whereas the ordinary peaches cannot travel beyond Delhi or Agra.

47,235. Is that the case with plums also? Has the season for plums been increased from 30 to 90 days?—I have not counted the days, but that is my impression.

47,236. And that again is an improvement which has been shown to you by the department?—Yes.

47,237. *Sir Ganga Ram*: You said you are the owner of 1,500 acres of land. Are you the sole proprietor of that land?—Yes.

47,238. Did you inherit this land or did you buy it?—Some of it I bought and some I inherited from my father.

47,239. How much has been inherited?—I think some 1,200 or 1,300 acres, and the remainder was bought by myself. Some of the land was purchased by my guardian for me and some I purchased myself.

47,240. How many sons have you?—Only one.

47,241. Supposing you had four or five sons will the land be equally divided among them?—Yes, according to the Islamic law it will have to be equally divided.

47,242. So that within three or four generations it would come to about 10 acres to each? What would happen then?—I am not responsible for the future when I will be no more.

47,243. What I want to know is, whether you would recommend that a certain area should be made impartible, that is, not divisible. Would you like to have the law of primogeniture?—I would agree with the majority of the public here.

47,244. Would you not lay down certain limits beyond which partition should not take place?—Without gauging the general sense of the representatives of my Province I am not prepared to answer that question.

47,245. What about the dignity of Nawab? That dignity will not remain once the area dwindles down to 10 or 15 acres?—Every Pathan who is free considers himself to be a Nawab; the Pathans are a democratic people and they have got no faith or belief in Nawabships or Khanships.

47,246. *Sir Thomas Middleton*: How many pairs of cattle have you got on your 50 acres?—I have some four pairs of bullocks for improving the waste-land.

47,247. What did these bullocks cost you?—An average pair of bullocks cost me something like Rs.250.

47,248. For how many days in the year do they work?—I do not exactly remember because the work is done under the supervision of my agent.

47,249. *The Chairman*: Have you got any sheep?—No.

(The witness withdrew.)

APPENDIX.

General remarks made by Khan Sahib Mohammad Aslam Khan regarding the condition of agriculture.

The most evident reason of the backwardness of Indian agriculture is the absence of the use of the modern machinery of Europe and United States of America. The goods imported to India from Europe and America to meet our requirements are machine-made, and in exchange for a full

week's earning of an Indian cultivator we get the production of only an hour's work of foreigners and hence the Indians are consequently losers. To remedy this evil either the import of machine-made foreign goods should be prohibited so that India may produce even those goods by manual labour as they do in agriculture, or Indian agriculture should be elevated to the standard of the industries of Europe and America wherein the more productive and time-saving machinery is used, so that there may remain no difference between the agricultural life of India and that of the comparatively advanced countries of the world who export their machine-made goods to our country and feed upon the scanty earnings of our manual labour.

Our Province remained part and parcel of the Punjab from 1849 till 1901, and in every phase of life we were progressing at the same pace as the Punjab, when we were unfortunately separated from it in November, 1901. Since then our progress has been retarded in every respect, so much so that for the last 26 years, having remained separated from our main body, we have been supposed not to deserve those rights (Reform Scheme) which are enjoyed even by our immediate neighbours, i.e., the District of Attock, Mianwali, Dera Ghazi Khan and Muzaffargarh, who are in no respect more advanced than we are.

There is very little difference between the agricultural life of the Punjab and that of our Province generally and the agricultural life of our Province and that of the northern half of the Punjab particularly. So any scheme which proves successful in ameliorating any aspect of agricultural life in the northern half of the Punjab can most surely be brought into practice with enormous advantage to the people of our Province, plus arrangements for safety of property and life after sunset and the spread of education on a more liberal scale, for the disease of our ignorance is supposed to be more serious and more chronic, and, therefore, a more chronic and more serious disease requires stronger and bigger doses of medicine. At the same time I should like to suggest that agricultural education should not be inserted in the present system of education and it should be allowed to develop the mentality of the people. As regards agricultural education, there should be separate middle and high schools in suitable places, the former containing four classes and the latter six classes (including four classes of middle). It should be left to the choice of the student, after passing the fourth primary examination, as to whether he would join an agricultural middle school or that of Arts, but he must pass the middle school examination. To make education compulsory up to the middle standard is the crying need of our Province, and until it is done it is quite useless to spend even the present amount on primary education, because, after having passed the fourth primary, if a student does not study any further, he forgets everything within two or three years.

Genuine forests in this Province are to be found in the Hazara district and, instead of being of any use to the agriculturist class, they are a source of constant trouble and nuisance to the public generally and to the neighbouring villages particularly, on account of the corruption and extortions of the subordinate officers and the Forest Department. The Hazara people say that to live in the neighbourhood of a forest is just to live in the vicinity of hell.

If here in the Peshawar district, on suitable spots in the canal irrigated area, small forests amounting to an area of about a square mile each are started, and arrangements made to stop the corruption of the officers thereof, that would relieve the troubles of the agriculturist class to a great extent regarding the scarcity of firewood, grass, timber wood, etc.

The scarcity of firewood in rural areas here can easily be removed to a great extent if the Canal Department decreases the water rate for the crop of *arhar* which is generally sown by the peasantry for fuel.

Increase in the number of post and telegraph offices in the canal irrigated area and the extension of railway, roads of both sorts, metalled and unmetalled, will have a tremendously good effect on agriculture. In Peshawar district the connection of Mardan with Swabi and Charsaddah, and that of Peshawar with Abazai, and that of Abazai with Takht Bahi by railway, will prove highly useful from the agricultural, political and commercial points of view. Similarly, the connection of Mardan with Katlang, Kohi Barmol, Rustam, Lund Khowar, and that of Takht Bahi (a newly started market on Nowshera Dargai railway) with Abazai, and that of Mardan with Utmanzai *via* Shah Beg, Ferozepur, Khan Mahi, Mohammad Nari, by metalled roads will result in unexpected prosperity of the agricultural life of the canal irrigated area of the Peshawar District, and the increase of communication between these places will also mitigate the unsafety of property and life after sunset to a very great extent.

Our land is assessed and taxed separately by the Revenue and Canal Departments on the basis of inquiry about rates in the markets, but no provision is made to connect and link us by means of roads with those markets so that we may transport our agricultural products freely. The so-called few roads laid out by the District Board long before the construction of the canals, i.e., in the beginning of British Raj, are incompatible with the needs of the people to-day, and happen to be built in out of the way areas at present. In addition thereto they are very badly managed and consequently turn out impassable. Therefore for vehicle traffic we are at the mercy of the canal authorities, who are too sparing in the allowing the use of their roads, and only influential personalities can obtain permits to use the canal roads on the payment of very high fees for mileage. The middle class and the public in general have no means of conveying their products to market, except the one which has been in vogue since pre-historic times, i.e., loading on pack animals, which is inconsistent with the advanced times and expensive in addition.

A merchant sells his merchandise worth lakhs of rupees and the same passes through numerous hands without any stamp duty thereon, but a tract of land at every alienation undergoes the burden of stamp duty, etc., at full selling price, and so a big portion of its value goes to the Imperial Treasury in the form of stamp duty, etc.; add to this the absence of capital required for farming, the exorbitant rate of interest paid by the zamindars on the necessary capital borrowed from the village *sowcar*, the amount required to avail oneself of the luxuries imported from the West, and the net result is the irremediable insolvency of the zamindar. At the most the stamp duty can be justified only on the first alienation of a land and thereafter there should be only the registration and mutation fees, and nothing more on any subsequent transfer.

The Meteorological Department informs the Canal Department of the coming events and changes in weather, but not the zamindars, and so that department is quite unknown to the zamindars. Similarly, as to the current rates of agricultural products in markets and any probable changes occurring therein in the near or distant future, not the rural population only but even the zamindars living in towns are always in the dark and so every penny of probable profit in this respect goes to the pockets of the Banias.

The underground water-level is rising very rapidly every year. Even now very extensive tracts of land have gone out of cultivation and become water-logged in the canal irrigated areas in the Peshawar district, which can be ascertained very easily from the annual returns of the Canal and Revenue Departments. Had the Canal Department at the time of the

construction of the Canals made arrangements by way of precaution for the necessary drainage at suitable spots, the present state of things would have been avoided.

At present we hear a rumour that the Canal Department has decided to dig out drainages at suitable spots in order to lower the underground water-level and get the waste land reclaimed and rendered culturable; but at the same time it is said this scheme is going to be completed within a period of five to 10 years. Along with the present ignored condition of agriculture and the utter disregard of the circumstances of zamindars on the part of the Government if this drainage scheme is also taken up by the Government in such a slow manner, the area at present cultivated will certainly go out of cultivation within a very short period, and though the Government will not feel the loss of water-rate or revenue of so big an area, yet the agriculturist class will surely turn into mere dacoits and robbers on account of having no occupation or employment to live by.

The introduction of the Land Alienation Act has proved an unexpected blessing in the Peshawar district generally, and in our Mardan sub-division particularly, but the place heretofore occupied by the blood-sucking *sowcars* and professional usurers has been taken by the capitalist big zamindars who, though possessing thousands of acres of land (both sorts, cultivated and waste) are still striving to acquire more and more of it and trying in every way to ensnare the middle class landowners and to deprive them of their lands. If this state of things continues and the middle class zamindar is not protected from the devouring policy of the big landlords the result will be that a large number of people will lose proprietary interest in land and consequently in agriculture, and the only means of earning their livelihood will be highwaymanship, robbery and raids. There should be a law to the effect that if a zamindar already possesses a certain number of acres of land, say two or three thousand acres in one sub-division, he must not purchase more there, but should improve what he already owns, and invest his spare capital in other agricultural concerns conducive to the common welfare of the zamindar public, like co-operative credit societies, zamindar banks, dairy farming, poultry farming, sericulture, etc.

In undertaking the above schemes for the development of agriculture, the question of finance naturally arises. For this I have suggested no solution in these remarks; but it is a matter of common knowledge that we have been formed into a separate Province not on any economical basis or self supporting principles but for some political or Imperial purposes, and so every new scheme for the development of any phase of life in our Province should be financed from the Imperial Treasury or Political Fund, because we are the gate-keepers of India.

As to the recruitment of the agriculturist class in various departments of Government service generally, and in the Revenue, Judicial, Irrigation, Agriculture, Education and Engineering Departments particularly, it hardly needs any recommendation. The agriculturist class must be given any opportunity in the different departments and it will be one of the infallible remedies for the uplift of this heretofore ignored class. Up to this time everything has been enjoyed by the non-agriculturist and the capitalist exclusively, and the agriculturist has been playing the part of a slave.

Regarding the visit of the Royal Commission the whole of our Province generally, and the zamindars of the irrigated area particularly, are really very anxious to see themselves relieved of their present calamities, difficulties and troubles and to make a new and prosperous start in life as a result of the recommendations of the Commission.

KHAN BAHADUR ABDUL RAHIM KHAN, M.B.E., Barrister-at-Law. Gul Imam.

Replies to the Questionnaire.

QUESTION 5.—FINANCE.—(*a*) Co-operative societies, co-operative banks and co-operative stores should be immediately started and properly controlled. Government officials responsible for the maintenance of these should be selected out of the agriculturist classes, who could be expected to be well acquainted with the difficulties and needs of rural communities.

Short term credit would be more useful in the case of advances made for the supply of seeds, etc., but in cases of advances for improvement of land or purchase of bullocks, etc., the long term system would be of greater use.

(*b*) Yes. At present full use is not made of the facilities of the *taccavi* loans granted by the Government. The poorer agriculturists of rural areas are either ignorant of the existence or working of the system, or find it impossible to go through the long and tedious process of making applications and spending days and days in going about from one small official to another. Very often the loans are granted to those who can approach the small officials easily and the more deserving and needy are lost sight of.

The system of *taccavi* loans should be made better known to the poorer peasants living in remote rural parts. Better facilities should be provided for the less advanced farmers to obtain loans. The long process at present in vogue should be shortened. Loans should, wherever possible, be granted on the recommendation and at the instance of the more respectable zamindars themselves. The borrowers should be required to pay loans by easier instalments. The securities demanded should not be too heavy.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are (i) The general poverty of the peasant classes.

(2) Uncertain supply of water.

(3) Failure of harvests, due to want of control over flood water.

(4) Indebtedness due to high rates of interest charged by moneylenders.

(5) Want of education and proper training in scientific methods.

(ii) The sources of credit are the crafty weighman and the unscrupulous moneylender, who charge extortionate rates of interest and cheat the poor illiterate peasants in many different ways. Cases can be cited orally.

(iii) The main reasons preventing peasants from repayment of debts are:—

(*a*) The very high interest charged which makes it impossible for the borrower to pay even the interest, not to speak of the principal, out of the produce of his soil.

(*b*) The system of accounts adopted by the moneylender who defrauds the poor peasant in various ways, keeps his accounts in a language which even the educated among the agriculturists do not know.

(*c*) The small yield of crops due to old methods of agriculture adopted.

(*d*) Occasional disease among cattle and the ignorance of the agriculturists of veterinary science.

(*e*) Occasional failure of water supply, there being no perennial canals.

(*b*) The Usurious Loans Act and the Punjab Redemption of Mortgages Act should be introduced immediately and worked sympathetically Special measures should be taken to require the Bania to keep his accounts regularly and supply the borrower copies of the entries in his books at regular intervals or whenever required. Co-operative banks should be started in every village.

(c) Non-terminable mortgages should be entirely prohibited. Legislation on the lines of the Punjab Land Alienation Act should be introduced in every part of India, and necessary restrictions placed on the liberty of the agriculturist to mortgage or sell his lands and property wholesale.

QUESTION 8.—IRRIGATION.—(a) In both the districts of Dera Ismail Khan and Bannu new irrigation schemes can be successfully carried out which will turn the existing barren tracts into pleasant and fertile smiling fields.

(i) Perennial and non-perennial canals can be constructed in both the districts.

In Dera Ismail Khan (1) the present inundation canal of Paharpur can be very easily made a perennial one, at a cost of only Rs.180,000; (2) in the same way Waran channel can be very easily made a perennial one. If the scheme for the Kalabagh Canal on this side of the river Indus is carried out it will change the whole aspect of Dera Ismail Khan and a pretty large portion of the Bannu district.

3. In Dera Ismail Khan the floods have much to do with its irrigation. If the authorities will seriously attend to them and have the help of the expert at their disposal they can do lots and by controlling these floods they can do no end of good to the zamindars, because wherever these floods are brought under proper control they have made the poor zamindars rich and happy. These floods taken under control not only increase the productive quality of the soil but also increase its value and price as every year they throw silt over the irrigated fields.

For instance, Bund Sangra-Wala, constructed by Mr. Copeland, in Dera Ismail Khan, has done wonders. The price of that land was then Rs.3 per *kanal*, now it is at least Rs.25. The zamindars of that tract are happy beyond their expectation. Similar schemes there are in plenty in our district, only they have to be carried out. They would make it a garden and we could then proudly call it a happy valley.

In Bannu, although there is perennial water, still big portions of land are lying altogether uncultivated. If the Kurum Dam Scheme is taken in hand and completed it will irrigate these vast fields and their source of irrigation will be a perennial one.

In Bannu if the flood water of the Gambila Rod is taken under control it will irrigate a very big area which at present is lying altogether barren and uncultivated. The floods in the Gambila Rod are not utilised by the zamindar at all. Its source of irrigation is not a perennial one but it can be made a most useful and paying non-perennial one by building dams at different spots.

In Bannu district there is a great scope of increasing water supply by drainage and by sinking artesian wells, specially in the tracts lying between Ghariwala and Tutghari.

(ii) Tanks and Ponds.

There is not much scope for developing tanks in the districts of Dera Ismail Khan and Bannu, but ponds can be worked out most successfully in the Dera Ismail Khan district, especially along the side of the river Indus by *jalars* and the pumping system.

In the Bannu district there are no ponds but there are some spots, specially in the bed of the Gambila Rod, where the pumping system can be introduced.

(iii) Wells.

Wells can be sunk in a good many places in the Dera Ismail Khan district where already a lot of wells are sunk.

In Bannu, too, there are lots of uncultivated places where wells can be very easily sunk, especially in Dalokhol and the tract lying between Lukky and Dalokhol along the side of the Gambila Rod.

The obstacles in both the districts for the extension of irrigation by each of the above methods is want of special attention by the authorities concerned. I do not mean to insinuate that the authorities are altogether indifferent. I mean that not so much special interest is taken by them as the poverty and pitiable condition of the poor people require and deserve.

QUESTION 12.—CULTIVATION.—(i) I do suggest improvement in the existing system of tillage which is a most defective one, specially in those fields which have got perennial sources. For them modern ploughs are most necessary; if they were introduced they would decrease to a great extent the hard labour of the poor tenants. Our present ploughs are working at a great disadvantage on the marshy and grassy tracks and if the modern improved plough is introduced it will reduce the labour a lot.

(ii) The customary rotations and mixtures of the more important crops are necessary, but unfortunately the poor zamindars are either ignorant or in some places they cannot afford to do so, especially where the soil is rich and irrigated by floods, because if they grow gram or other crops instead of wheat the produce is not equal to that of wheat either in quality or in quantity.

QUESTION 14.—IMPLEMENTS.—(*a*) I would strongly suggest and recommend the improvement of existing agricultural implements and the introduction of new agricultural implements and machinery. These improved implements are necessary for the big zamindars.

(*b*) The following steps may usefully be taken to hasten the adoption by the cultivator of improved implements:—

(1) In each tahsil there should be an institution where these implements will be kept under a trained person who will teach and demonstrate to the zamindars how they are worked.

(2) The Government should arrange to provide and supply these improved implements at the least possible price to zamindars.

(3) If that is a troublesome task for the Government then they should advance *taccavi* to the big zamindars, who would do the needful for the cultivators under the supervision of trained persons who would be engaged by them.

(4) If the above suggestions cannot be acceptable to the Government, they should have an exhibition of these improved implements in each district under the supervision of a trained person.

(*c*) There are lots of difficulties which manufacturers have to contend with in the production of agricultural implements and their distribution for sale throughout the country. We know that in India, unfortunately, there are very few manufacturers of implements and these few have not got sufficient capital to manufacture in sufficient number as the implements are not cheap and therefore do not fetch sufficient profit.

I suggest the following means and measures by which these difficulties may be removed:—

(1) These manufacturers should be encouraged and patronised by the Government, either by the purchase of a sufficient number of these implements or by advances of money to them, in order to enable them to distribute them among the cultivators.

(2) The big zamindars should be given *taccavi* for purchasing implements from the manufacturers.

The best thing would be that in each province the Government should start a factory in which implements will be made and sold at a nominal price to the zamindars. In these factories the iron-smiths should be allowed to work so that they may learn how to make these implements; unless they have the required training they will not be able to manufacture

the implements and sell them cheap. This factory will not be an expensive one in the long run.

QUESTION 15.—VETERINARY.—(*a*) Unfortunately we have no Director of Agriculture in our Province; if we have one, I would strongly recommend that the Civil Veterinary Department should be directly under him; as we have none, naturally it must remain independent.

(*b*) (i) Dispensaries are not entirely under the control of Local (District) Boards. They are partly under the control of the District Boards and partly under the Municipalities. If they come under the control of Local Boards there is no reason why this system should not work well.

(ii) The need for expansion is not adequately met in our Province because there are not sufficient dispensaries to meet the local demand.

(iii) I would not advocate the transfer of control to provincial authorities.

(*c*) (i) Agriculturists make full use of those veterinary dispensaries which are available to them.

(ii) Unfortunately there are no touring dispensaries in our Province. If there had been touring dispensaries agriculturists would have made full use of them.

(*d*) Many obstacles are met with in dealing with contagious diseases:—

(1) There is not sufficient medical help available for agriculturists to take advantage of.

(2) If there is some medical help available to them, it is far away. So on account of their ignorance and conservatism they hesitate to take advantage of that.

(3) There is not sufficient grazing ground in order to segregate animals suffering from contagious diseases, and all the cattle graze on the village common. I would certainly advocate legislation dealing with notifications, segregations, disposal of disease cases, compulsory inoculation of contacts and prohibition of the movement of animals exposed to infection.

Failing legislation, it is rather difficult to suggest any other effective means of improving existing conditions, as it is difficult to have a strong village committee to cope with the difficulty.

(*e*) I do not think we have sufficient serum to meet the demand, as we have not got sufficient dispensaries.

(*f*) Firstly, as there are not sufficient dispensaries for preventive inoculation, so naturally this question does not arise. If we had dispensaries, there would not be any obstacle in the way of popularising preventive inoculation. As far as I know, no fee is charged in the available dispensaries. Certainly, if any fee is charged from the poor zamindars and tenants that will act as a deterrent.

Note.—In our district the condition of the zamindars is very pitiable indeed. We have no touring dispensaries at all. When there is any disease the animals die without any veterinary help. These touring dispensaries must be started and introduced at once, because cattle die in great numbers. Each animal lost is a great pecuniary loss to the poor tenant. The prices of oxen are increasing by leaps and bounds; the poor tenant is always handicapped when he loses his bullock, and its loss is a loss of a fortune, as he hardly earns as much every year as is equal to its price.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) The following measures should be taken to attract agricultural labour from areas in which there is a surplus to areas under cultivation in which there is a shortage of such labour:—

(1) *Taccavi* should be given to tenants for buying bullocks.

(2) *Taccavi* should also be given on favourable terms for their maintenance.

(ii) In areas in which large tracts of cultivable land remain uncultivated, such uncultivated land should be given to the tenants on favourable terms, *i.e.*, the rate of *batai* should be profitable to the tenants, and for a short period no *batai* should be taken at all. After that period, for a certain time nominal *batai* should be taken by the owners. The half-and-half *batai* should not be enforced until after a pretty long time. Such tenants should be helped with *taccavi* for buying bullocks, &c.

(*b*) There is a shortage of agricultural labour in our district owing to the following causes:—

(1) Our lands are not irrigated on account of our streams and channels not running in working order.

(2) Land in a good many villages remains uncultivated for a long period.

(3) On account of failure of harvests, shortage of fodder took place which did away with a good number of cattle. The result is that a good many villages have absolutely become deserted. Now if these channels and streams are brought under working order by controlling the flood water, the difficulty will be met in a short period.

QUESTION 19.—FORESTS.—(*a*) The present lands are not put to their fullest use for agricultural purposes in our Province. No grazing facilities are granted to the zamindars. On the other hand, the forest rules are very hard and strict, especially in the Abbotabad district, where the zamindars are rightly grumbling against their strictness. The sooner these strict orders are done away with the better. If the members of the Commission will pay a flying visit to some of these spots they will see with their own eyes how hardly and strictly these hard rules are enforced. I am not certain that forest rules in other parts of India are as hard as these, but I believe they must be pretty hard too. They deserve to receive the Commission's immediate special attention.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) The following steps are necessary to induce a larger number of men of capital and enterprise to take agriculture:—

(1) They should be given Government land on favourable terms.

(2) They should be encouraged to have Government land on a lease for a period in which they could make sufficient profit. It would be a mutually paying concern, because after that period of lease the quality and value of the land would have increased so much that that land would fetch a fancy price.

(*b*) The following are the chief facts tending to discourage owners of agricultural land from carrying out improvements:—

(1) The land is not a paying concern.

(2) They do not receive *taccavi* for their requirements.

(3) These constant settlements are a serious obstacle in the way of improvement.

(4) They do not receive the sympathy and help they deserve at the hands of the officials.

(5) They have not got any zamindar association which can bring its requirements and needs to the notice of officials.

(6) Lastly, the zamindar's profession is neither a paying concern nor can it command respectability in the eyes of officials.

General Remarks.

At the end, I would venture to request the members to allow me to bring a few points to their notice for their kind observation, consideration and reflection:—

1. It goes without saying that at present a serious problem which troubles the zamindars all over India is that the prices of bullocks are daily rising

by leaps and bounds. Not only does this worry them at the present, but in the near future this will be a still more serious problem for them, and I must say it will be beyond their power to solve it. It will also put Government in an awkward position to find a remedy.

It is rather sad that Government did not grant land to the zamindars for breeding cattle at the time when it realised its difficulty from the military point of view and took what steps were necessary for the Army requirements; if that step had been taken then, the question would not have been so serious, and there would not have been any chance of its becoming so alarming in the near future. Fortunately or unfortunately, in India the majority of the landowners are not big zamindars. The land is owned by petty zamindars. There is no chance that the petty zamindars will improve their land through machine cultivation; they must always depend on bullocks. Now, one has to see how that can be done. There is only one way to meet it, and that is to increase pasture grounds everywhere. In India there are vast green fields and green mountains which can be usefully utilised for that purpose. The zamindars should be given all possible facilities for starting breeding of cattle; that will enable them to start dairies and the breeding of all kinds of cattle which will enable them to have good bullocks, good cows, good sheep, &c. It will enable them to have a strong constitution and physique by having plenty of milk, butter and good meat in their diet.

If proper attention is devoted to that line there is no reason why India should not provide butter and meat to markets outside of India. It is rather disappointing, when one goes to Simla, to see that one has to get butter and milk from the Aligarh dairy. Although all these mountains are very green and grassy, still one sees no good cattle. If it is fair to expect the zamindar parents to give their sons as soldiers for India, is it not equally fair that the State in particular, and all Indians in general, should see that the zamindar parents and their children are properly maintained and brought up in a good physical condition?

The big zamindars can, perhaps, do away with bullocks and they can develop their land with the modern machinery system, but the poor zamindar has to look to the bullock for cultivating his land. By providing him with the pasture grounds we will enable him to have cheap strong bullocks. It is desirable that an effort should be made to provide pasture grounds if possible in each district to meet the local demand of the zamindar in this respect.

2. I would also suggest that all the revenue officers who are in touch with the zamindars should have compulsory agricultural training as they have compulsory settlement training. It is rather hard to put the destiny of the poor zamindar in the hands of officials who are simply interested in them as a matter of duty. These officers, to be kind and sympathetic, must be interested in them by nature, and that can be brought about only by getting them to understand their needs and wants. When they get this training they are bound to get such sympathy and a natural liking towards the poor zamindars.

If possible, these officers should be taken from members of the zamindary class who are qualified. There is also the same unpleasant relation between the big zamindars and their tenants. As the big zamindars have not received agricultural training so they do not treat the tenants fairly. In order to remove this unpleasantness the big zamindars' sons should also receive agricultural training.

I would strongly suggest that in all institutions which are meant for the sons of Chiefs a thorough training in agriculture should be given, so that when they leave these institutions they may be good and kind zamindars and useful citizens.

3. Unfortunately, the present system of agricultural education in all institutions is a defective one in a good many points:—

(*a*) There is not sufficient practical education.

(*b*) The chief defect is that they are so conservative and partial that they consider it a sin to admit students from outside of their Province.

It is strange that when the question of duty comes we should call ourselves Indians, and when the question of right comes we should call ourselves Bengali, Madrasi, Punjabi, &c.

It is rather hard on those Provinces in which there is no such institution that, as a rule, their students are not admitted in the institutions of other Provinces, and even if some neighbouring Provinces happen to take their students they are taken in a very limited number.

I would suggest that students from such Provinces should be admitted in all agricultural institutions all over India. This is the case with us as well as with the people of Baluchistan.

4. I would suggest that every year a good many qualified students should be sent out of India, at least for three years at State expense, to study and specialise in some particular branch of agriculture, and when they come back they should be patronised by Government, who should provide them with grants of land and money on favourable terms.

5. I would suggest that one institution directly under the control of the Government of India should be opened, where complete practical education should be given to qualified students from different parts of India.

6. Lastly I would suggest that the Government should also draw the attention of the Ruling Chiefs of India to the necessity of carrying out similar improvements in their States so that the zamindars all over India should move forward together.

The management of all properties which are under the Courts of Wards should be entrusted to qualified persons who will see that the property is improved and developed on modern lines. Moreover, all those minors to whom the properties belong should have a thoroughly good training in agriculture, so that when they take charge of their properties they may be a blessing not only to their own families but also to their tenants and to their country.

Oral Evidence.

47,250. *The Chairman*: Khan Bahadur Abdul Rahim Khan, you are a barrister-at-law from Gul Imam?—Yes.

47,251. You have sent us a note of the evidence you wish to give. Do you wish to add anything to that at this stage?—I wish to bring to your notice one point I omitted to mention in my note, but which is most important. Before any recommendations are made by the Commission with regard to this Province, I think it is most important that we should be put on the same footing as other Provinces. The Reforms have not been applied at all in this Province. I do not wish to insinuate anything against our officials, but until the voice of the people can find expression in elected district boards and municipalities and through representatives in the Legislative Assembly no recommendations can be effective.

47,252. You put that forward as having, in your view, a direct bearing on agricultural progress?—Yes.

47,253. You realise, of course, that this Commission has nothing at all to do with constitutional questions?—Yes. But it is a most important point to make your recommendations effective and useful.

47,254. Have you experience of agriculture matters?—I am not an expert. I am a zamindar, and I own a good deal of land and take an interest in

my tenants; but I have not had an agricultural training and have no agricultural qualifications.

47,255. You do not farm yourself?—I have started doing a little for the sake of recreation, but that is all.

47,256. How much land do you own?—My family owns a great deal of land; I cannot tell you the exact area. We hold a great deal of land in the Punjab as well as in this Province.

47,257. Do you own any irrigated land in this Province?—Yes.

47,258. I see you have high hopes for the future of co-operative societies in this Province?—Yes.

47,259. Are you familiar with the past history of the movement in the Province?—I do not know of any attempts to introduce it.

47,260. You do not know of any attempts to introduce co-operative credit societies here?—Not in our district.

47,261. You think the cultivators of this Province will take to co-operation readily?—Yes. Our people are very enterprising; next to the Parsis, they are the most enterprising community in India. When they see a thing is good they take it up. If you make a tour through this Province you will see that many people here have bought motor lorries, motor cars, and so on. Many of our people have been to Hong Kong, China, and to other parts of India, and they are always willing to take up any new ideas which seem promising. If Government, therefore, initiates anything constructive the people will take to it, and in the end Government will be saved a great deal of expense. Once Government shows the way our people will take more advantage from it than any other community in India.

47,262. With regard to *taccari*, you say the existence of the facilities should be made better known to the poorer cultivators, and the machinery should be simplified?—Unfortunately, *taccari* here is often not utilised for the purpose for which it is taken. As a rule, *taccavi* is given to very poor people, who are always in debt, so that when they get *taccavi* for, say, buying bullocks, they spend it in paying off their debts. As a rule *taccavi* is given, not on the representation of respectable zamindars but to anyone who goes to a petty official and asks for it. I know of instances where men who won no land at all have got it. *Taccari* should be given to the bigger zamindars, who could make much better use of it; they could buy bullocks and hand them over to their tenants. At present the small men have to pay out sums of money to various petty officials or they will not get anything. I do not think that is confined to this Province only; it exists all over India.

47,263. You will probably agree with me that before Government can lend public money in the form of *taccavi* loans it is necessary that due and sufficient inquiry should be made as to the applicant, his need for credit and so on, and that punctual repayment must be insisted on; but you think that, apart from those points, the machinery might be simplified?—Yes. In America, I believe, there is an institution by which the farmer can go direct to a firm and get the assistance he requires. If such an institution were started here I think it would be found to be cheaper.

47,264. Amongst the reasons which you give on page 42 of your note for agricultural indebtedness is "Uncertain supply of water." Is that a criticism of the Irrigation Department?—No. I am speaking there of my own district, where a lot more could be done. Everything depends on the control of the flood water. If it is not controlled the tenants run short of water and their bullocks die. Then they have to borrow money from the moneylenders at a high rate of interest, and thus a failure one year means that they are in difficulties for two, and can only get straight again in the third year.

47,265. Do you think the irrigation authorities might do more to help? —Yes, especially in our district. I am not criticising the Irrigation Department, but they have to look at things from their own point of view. For instance, take the Paharpur canal, which used to be under the Irrigation Department. The people in the area it served applied for it to be made perennial. It could be made perennial at a cost of Rs.1,80,000. As this has not been done the villages along that area are becoming deserted and the land going out of cultivation, all for want of Rs.1,80,000. The trouble is that this Province is regarded as a sort of white elephant, because the charges for the independent territory fall on us, though they do not benefit us in any way; and the members of the Assembly do not take much interest in us. We asked Government to spend the necessary money to make the canal perennial, and said that if Government did not see its way to do so it should advance the money to the zamindars and lend an expert from the Irrigation Department. The Waran canal can also be made perennial. Mr. Copeland, who was Revenue Commissioner, constructed a dam there at a cost of Rs.25,000 which has been of the greatest value to the zamindars. The price of land has risen ten times in consequence.

47,266. On page 42, in answer to our Question 6 (*b*), you say: "The Usurious Loans Act and the Punjab Redemption of Mortgages Act should be introduced immediately." My information is that the Usurious Loans Act has been introduced in this Province?—In time everything introduced in the Punjab is introduced here also. If it has been introduced already, so much the better; but the zamindars do not know of it.

47,267. What steps could be taken to make the Usurious Loans Act more effective in this Province?—What has been done in the Punjab.

47,268. What about the other Act you mention, the Redemption of Mortgages Act? Has that been introduced in this Province?—I do not think it has been.

47,269. My information is that that Act has already been introduced in the five districts of this Province?—I did not know that.

47,270. It has not been effective, so far as you know?—No.

47,271. In answer to our Question on Irrigation, you say "The present innundation canal of Paharpur can be very easily made a perennial one, which will cost only Rs.1,80,000." That is the one you have just mentioned? —Yes.

47,272. On what is that figure founded?—When the last deputation waited on the Chief Commissioner he replied that the Canal Department were making a survey on our side of the Indus. We are waiting for the result of that survey.

47,273. Can you tell us what authority lies behind that figure? —We put it in when we made our application, and I think it is correct. I think it was taken from a report by the Canal Department.

47,274. On page 44, replying to our question on wells, you say: "The obstacles in both the districts for the extension of irrigation by each of the above methods is want of special attention by the authorities concerned." What exactly is in your mind there? That the wells should be constructed by Government, or that the people should be helped to construct them?— No. It is unfortunate, but I do not think a proper geological survey has even been made in this Province. I have studied geology a little and am applying my knowledge to my land at present. I think artesian wells could be sunk in many parts of the Province. The Commission is probably aware that artesian wells have been sunk near Quetta, and if they can be sunk there it seems probable they could be sunk here.

47.275. You want facilities for them in this district?—Yes.

47,276. You think cultivators would be prepared to finance the operation? —Yes.

47,277. In answer to our question on Implements you say: "The big zamindars should be given *taccavi* for purchasing these implements from the manufacturers." Is there anything to prevent them obtaining *taccavi* at the present time for this purpose?—In the Punjab where there are these facilities they are taken advantage of, and I think they would be here. I do not mean to say our officials are not sympathetic, but the object of this Commission, I think, is to encourage the zamindars.

47,278. I quite understand the general principle you are enunciating, but I do not see how it applies here. You say the big zamindars should be given *taccavi*. If a big zamindar applies for *taccavi* at the present time, is his application refused?—The amount of money sanctioned is not sufficient for the big zamindars, and as a rule it is given to the small men rather than the bigger ones. It is said that the big zamindars have money of their own and can afford to do these things themselves, but that the small men have not and should therefore be given *taccavi;* but I think they should be liberally provided with funds.

47,279. On page 45, in answer to our question on veterinary matters, you suggest that veterinary dispensaries should be placed completely under the control of Local Boards rather than under the joint control of Local Boards and Municipalities. Would you like to develop that at all?—As I have said already, there is no system of election to our District Boards and Municipalities, and public opinion has no voice. No doubt respectable and popular men, both from the point of view of Government and of the public, are appointed to these bodies, but elected men would be responsible to the people, and if they did not do their duty they could be replaced at the next election.

47,280. On page 46, in answer to our Question 19 (*a*), you say: "On the other hand the forest rules are very hard and strict especially in Abbotabad district where the zamindars are rightly grumbling against their hardship." Will you expand that?—I am ignorant of the forest rules in other Provinces, but the Forest Department look at things from their own point of view, which is to sell the timber and make as much money as possible. They do not look at it from the point of view of the zamindar. The cattle, for instance, are not allowed to graze; the grass has to be cut. I have no documentary proof, but I think the Forest Department in this Province is not paying, and if the forests could be handed over to the zamindars it would be a great blessing; at present there are no good cattle there and the zamindars are very badly off.

47,281. Are you familiar with any district where over-grazing has produced deforestation and deforestation has been followed by serious soil erosion?—No.

47,282. Do you know that there is danger of that? In some districts it is a very urgent problem from an agricultural point of view. On page 46 you say: "These constant settlements are a serious obstacle in the way of their improvement." That is in answer to our Question 24 (*b*)?—Yes. The difficulty is that after a period there is another settlement. The idea, of course, is to increase revenue; but that has a blasting effect on the energy and efforts of the zamindars.

47,283. What is the period of assessment? Not less than 20 or more than 40 years?—If Bengal has a permanent settlement, why should not there be one all over India?

47,284. You advocate a permanent settlement?—I am strongly in favour of it.

47,285. On page 45, you mention that the price of bullocks is rising rapidly. Can you give us any exact information on that matter?—I am myself a zamindar, and I remember the bullocks I used to buy 10 years ago.

47,286. In 1917?—Yes. I have to pay double as much for them now.

47,287. They have gone up 100 per cent. in price?—More than that.

47,288. What do you pay for a good pair now?—The other day I got a pair from Rajaun and paid Rs.100 each. Three years ago I bought a similar pair for Rs.50 each.

47,289. You think the price has gone up 100 per cent. in three years?—Yes, and when the Sutlej scheme is completed there will be a shortage of bullocks all over the Punjab. Rajaun is the source of our bullocks, but when the canal scheme is completed there will be a demand for them from all over the Punjab. That is why the Punjab is now giving grants for breeding. There is no local source of bulls in this Province.

47,290. What steps do you suggest?—A special inquiry should be made to see if bulls can be bred at Abbottabad, and in each district land should be acquired for breeding. In Peshawar there is Government ground for that purpose. Moreover, the military people should be stopped from buying *bhusa* in this district. In some places the cattle are getting no *bhusa* at all because it is all sold to the military.

47,291. On page 48 you say that it is rather hard that people from this Province, where there is no agricultural college, are not admitted to such institutions elsewhere. Is it your suggestion that they are not admitted to such institutions in neighbouring Provinces?—If they are it is as a favour, not as a right, and only a limited number is admitted. This Province and Baluchistan are under the Legislative Assembly direct, and everywhere we are regarded as outsiders; one of our men was refused admission to Pusa on that account. I think men from this Province and from Baluchistan should have special privileges and be admitted to any institution in India. We have big zamindars here, but there is nowhere for their sons to obtain proper education.

47,292. *Professor Ganqulee*: Did you say one of your students had been refused admission to Pusa?—Not a single man has been taken there.

47,293. But do you know definitely that one student was refused admission there?—It is a long time ago and I forget his name, but I know they do not take them.

47,294. *The Chairman*: The point is a very important one. Would you let us have in writing the name of this gentleman who was refused admission?—It was a long time ago. Everyone is interested nowadays in the improvement of agriculture, and every zamindar will soon want to send his son to an agricultural college. A certain number is taken at the Lyallpur College at present, but when a hundred want to go there the Punjab people will say: "We started this college for our own children, not for yours." I myself have had difficulty in getting admission for my two boys, whom I wanted to go to Lyallpur. I was told I had applied rather late, and only one boy was taken. The point is that the Punjab people have a prior right to vacancies, while there is nowhere where our boys have a right to be admitted; it is always as a favour.

47,295. Have you ever known serious difficulties put in the way of a boy from this Province going to Lyallpur College?—No, I do not say that, but it is an established fact everywhere that preference is always given to people from the Province itself.

47,296. *Sir James MacKenna*: You told us you did not take an active part in agriculture, but that you took an interest in your tenants. What sort of interest do you take in them?—I do take an interest in their work,

and I may be able to give them advice in the construction of dams and so on, but I am not an expert in the sense that I have agricultural education which would be of use to them.

47,297. I am not quite clear what your idea is with regard to these grass farms you suggest. You suggest that on the analogy of the interest Government took in military grass farms they should allot waste areas for grass for zamindars, for cattle-breeding?—In the Punjab a grant of land was given for providing horses for the cavalry, and there they have also started giving land to zamindars for cattle-breeding. Similar facilities should be given here.

47,298. That would be only for very big zamindars; it would not affect the general body of them?—Take my case, which is like that of any big zamindar here. I have hundreds of tenants, and if I had grass land for breeding purposes I could provide them with bullocks at cost price.

47,299. With regard to a limitation imposed on the number of agricultural students accepted from this Province, is there any provision in the Lyallpur College prospectus allotting a certain number of vacancies to boys from your Province?—In the old days people from this Province were treated more or less on the same footing as Punjabis, but now we are told "You are outsiders; you have nothing to do with us." Grants of land are no longer given to people from this Province. When it is a question of duties we are loyal subjects, but when it is a question of rights and privileges we are told we are outsiders.

47,300. You said you recollected a case where a student had been refused admission to Pusa. Have you ever heard of a student who was trained at Pusa?—No, not a single one to my knowledge.

47,301. There was one. Do you happen to know how many applications there are for training at Pusa?—We made inquiries, and they said they did not take outsiders.

47,302. There was some mistake there. Admission depends on qualifications?—This man was a B.Sc. What more can they want?

47,303. *Sir Ganga Ram*: They only take a B.Sc. in Agriculture?—That was not the qualification in the early days that I am speaking of.

47,304. *Professor Gangulee*: On page 47 you say "It is rather sad Government did not grant land to the zamindars for breeding cattle." Do you know of any instance where zamindars definitely approached Government with a scheme and were refused?—The Punjab will not give us anything. If this Commission would like us to make an application, we will put one in to-morrow.

47,305. That was not my question. I wanted to know whether you based that remark on any definite instance?—At the time the land grants for horse breeding were given it was not in response to a public demand. It was for the Government to foresee the necessity of this step.

47,306. Did you ever approach Government with a scheme?—Yes. My application was rejected.

47,307. Have you put up a definite scheme?—Yes. I applied for a parcel of ground to be given to me on long lease, but it was rejected.

47,308. When was that?—When Mr. Copeland was Deputy Commissioner.

47,309. *Sir Ganga Ram*: Did that land belong to Government?—Yes.

47,310. *Professor Gangulee*: You say you take an interest in your tenants. Do you know what crops they grow?—Every kind of crop: wheat, gram, rape seed, and so on.

47,311. What varieties of wheat do they grow?—They have tried Pusa 4, but from our point of view it was a failure, because the *bhusa* was not of good quality.

47,312. Did you introduce it?—No, they got it from the Tarnab farm.

47,313. Do your tenants grow any fruit?—We used to have very good oranges, but at present even the birds are dying of thirst; there is no water.

47,314. Has the value of cultivated land increased?—How can it? All the big zamindars are in debt.

47,315. The value of arable land has not increased in the last 20 years? —How can it? The flood water is not controlled and the villages are deserted.

47,316. We are told that one of the obstacles to agricultural development is the disinclination of big landholders possessing large areas of cultivable land to improve their holdings?—Up to now the zamindar has not been considered a desirable person to be respected.

47,317. By whom?—By the authorities. Moreover, the zamindar has many responsibilities on his shoulders. In other Provinces the zamindar says " I pay the revenue; Government is responsible for everything " and the taxpayer says " I pay taxes; Government is responsible for everything." Here, on the other hand, the zamindar is responsible for everything. For our protection we are given rifles and cartridges, but for every cartridge misused we have to pay R.1. We have to keep chowkidars for our protection. Is it fair, when other zamindars can sleep at night in peace while we have to be out on *Chagha* duty, that we should pay at the same rates?

47,318. Do you take cash rent or *batai*?—*Batai*. If you introduce cash rent you do away with rural life.

47,319. You say the zamindar's profession is not a paying one?—That is so.

47,320. But you take half the crop?—There are different methods. In sandy tracts we take a quarter and the tenant pays the revenue; in other lands we pay the revenue, and so on.

47,321. Even then you say the profession of zamindar is not a paying one? —There are times when they have lost a lot of money. If you have a cash rent system, what is to happen in bad years? You cannot send the tenant to jail.

47,322. Your tenants grow wheat?—Yes.

47,323. Can you tell us the average yield per acre of the wheat they grow?—It depends. On very good land they may get 2½ maunds per *kanal*.

47,324. On irrigated land we are told the yield is 1,500 lbs. an acre. Under the *batai* system you get half of that, but still you say it does not pay to be a zamindar?—You should ask the authorities what is the revenue of the different districts and tahsils, then you will realise how much is their income. Even if one takes half, there may be three years without harvest and then one will have to borrow money. The price of land increases wherever there is great demand. In the Punjab Colonies even the tenants have money, and if you want to sell some land you will have a lot of people wanting to buy it; but here there is no one to buy. I have landed property in the Punjab, and people write to me to know if I want to sell it. Here if I want to sell land I have to ask Government to take it; otherwise there will be no sale.

47,325. Are you of opinion that the zamindars of this Province would send their children to agricultural schools if they had facilities?—Yes.

47,326. You consider there is a demand?—Yes. Being a small Province, there are no openings for our boys. The best thing Government can do for us is to give us every facility for educating these boys, so that they

can make the cultivation of their land a paying concern. This Province has 80 boys who graduate every year, and there are no openings for them in the Services, because the present members of the Services are young and it will be many years before they retire. Unless farming can be made to pay the future is dark.

47,327. *Mr. Calvert*: Have you as a barrister ever pleaded the Usurious Loans Act before a court?—I have a criminal practice; I have no civil practice at all.

47,328. *Mr. Kamat*: As a barrister you have been taking a general interest in agricultural improvement. Is it possible for educated men like yourself to take an interest in furthering the co-operative movement in this Province?—Certainly, if we are encouraged to do so.

47,329. You say there are 70 to 80 graduates a year in this Province? —Yes.

47,330. There is scope for them to push on with the co-operative movement?—The initiative must come from Government, because there is nowhere in this Province where they can learn about it, and Government must put them on the right track; after that they can manage themselves.

47,331. You mean the lead which men like yourself, though not doing agricultural work, can give, should be utilised by Government officials for the furtherance of the agricultural and co-operative movement?—The first thing required is money. Unfortunately, people have the idea that this Province is very rich; in reality it is just the reverse.

47,332. You advocate in your note the expansion of irrigation?—Yes.

47,333. On the other hand we are told in this Government note that of late years the area irrigated from the Lower Swat Canal, the Kabul River Canal and the Upper Swat Canal has fallen. For instance in 1923-24 the total area was 3,59,000 acres; in 1924-25 it was 3,55,000, as against more than 4,00,000 in 1922-23. Could you give us any explanation why this is so, when you say that irrigation should be extended?—I am talking about Dera Ismail Khan and Bannu districts because I am not in touch with Peshawar; I consider that a lot might be done by controlling the flood water, and I quoted Mr. Copeland's scheme which is more paying. If a similar scheme is put in hand then I consider that the problem will have been solved.

47,334. From the Government point of view, schemes already worked are not being fully utilised and therefore they naturally like to be cautious. Have you any explanation for that?—A lot of water is taken by the independent territory and there is no revenue realised.

47,335. Do you suggest that the fault lies with the Irrigation Department rather than on the part of the people themselves?—I do not suggest that, but I do say that if *abiani* should be realised from the independent territory, the case would be otherwise.

47,336. *Sir Henry Lawrence*: Am I right in understanding that your view is that these grievances of yours can only be remedied by joining up your Province again with the Punjab?—Yes. Our prayer first is that we must be given local reforms just like the Punjab, but if that cannot be done and we are joined to the Punjab, I will be the first one to welcome that step. We are by no means intellectually inferior to the other provinces and we do not see why we should not be given reforms. If, however, reforms are not to be given to us then I would be the first one to say that we should be amalgamated to the Punjab. I think that to keep us back when we are admitted to be quite fit and intellectually the same as the other provinces, would be nothing short of a downright insult to us.

47,337. *Sir Ganga Ram*: Can you say that the Reforms have benefited the Punjab in any way?—If you have not been benefited by the Reforms then please do away with them; give them to us.

47,338. That is not the answer to my question. You say that because the Reforms have been given to the Punjab therefore you must also be given the same. Can you prove that the Punjab has in any way benefited by the Reforms?—As I say, if you have not been benefited by them then please pass them on to us. There is no doubt that you have been benefited in every way; you have Indian Deputy Commissioners, and other high Indian officials, such as Indian Superintendents of Police. Why should not Indians in this Province also hold such responsible posts? Why should they not become Deputy Commissioners and Superintendents of Police?

47,339. I want to know whether the prosperity of the country has increased through the Reforms?—Yes. The Reforms would bring a greater sense of self-respect.

47,340. You mention here that the inundation canals can be made perennial?—Yes.

47,341. How?—If men of the stamp of your noble self could only come here to introduce your irrigation schemes, then I think the Government would be saved from these things.

47,342. If facilities were given by way of admission to the Agricultural College, how many students do you think would take advantage of that? —There is nothing left to us but to become zamindars. For instance, I have got two sons and two cousins; one son and two cousins are at Aligarh. After one year I want them to go and study agriculture.

47,343. Will they take to agriculture?—Yes, they will. I myself am a zamindar and I am proud of it, so that I think my sons will also be proud of that line and take to it.

47,344. How much land have you got?—In Dera Ismail Khan our family is the biggest landlord; I can give you no figures because I do not keep the figures. I am a landed proprietor.

47,345. What is the system of inheritance in your family?—Equal shares. I am not in favour of the law of primogeniture, because if you have an unfit son it would simply be sinful to give him the control of the whole of your property; unless, of course, the boy has been well educated and is in a position to take up the whole management, I would see that the property was equally divided.

47,346. *Sir Thomas Middleton*: When you refer to the enterprising character of the people of the Province do you include the cultivators?— Yes, and also the ordinary tenants.

47,347. You complain of the absence of grazing ground. Is it not the case that in your own district there is an abundance of ground, but no grass?—No, for instance, the Paharpur Canal has a lot of Government land which is not sold out; it is given on *patta;* instead of giving it to the big zamindar, why should there not be pasture land available there?

47,348. Could you get pasture with the small rainfall of your tract, which is only 9 inches?—No, those lands which are under inundation canals are quite fit for growing grass.

47,349. The difficulty we have found is that when cultivators get water they prefer to grow food crops on it and not grass for the bullocks?—Yes, where flood water is available and the land is very good.

47,350. Is it your view that crops like gram should be grown for stall feeding on cultivated land?—Yes, we do actually grow gram on inferior land; also juar, because juar is not good for superior land on account of the roots remaining in the ground.

47,351. You refer to India having vast green fields and green mountains These fields, I am afraid, are only green during a month of two in the monsoon?—Take the case of the dairy at Aligarh. We used to get butter and milk from the Aligarh Dairy right up at Simla, and yet Simla I consider is the best place for breeding.

47,352. Do you think that the ordinary cultivator could incur as much expenditure as the owner of that Aligarh dairy does in feeding his cows?—Yes. During the war Government spent quite a lot of money in starting these dairies; Government could have easily patronized a big zamindar and thus run the business on a much cheaper scale. Government had special dairies at Razmak and other places. If the necessary facilities had been given to big zamindars they could have easily provided all the troops with dairy products.

(The witness withdrew.)

SAYAD PIR KAMAL GILANI, L.Ag., Jangal Khel, Kohat.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (i) All research affecting the welfare of agriculture should be carried on more extensively by every Local Government independently. The result of any research useful at Pusa may not be useful at Peshawar as places in India differ widely at short distances in natural, physical and chemical aspects. Therefore researches affecting agriculture may be started by every Local Government under the Revenue Department and financed by the same Department. Skilled workers should be employed for all such researches by the Government and also big landholders, Jagirdars enjoying *mafis*, etc., should be forced to make different sorts of experiments and research into the scientific value of the indigenous theory and traditional methods of agriculture at their estates and holdings, and inform the Revenue Department about the results of their experiments. Such independent workers should be encouraged by Government.

(ii) Nothing, or very little, has been done, to my knowledge, regarding veterinary research. Such researches must be started in cattle-breeding areas under the supervision of the Agricultural Department.

For want of skilled workers and field and laboratory facilities for study, all the branches of research have been ignored.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) The supply of teachers and institutions for agricultural education generally, and especially for training in the marketing of agricultural produce is quite insufficient. Throughout India (the third country in the world regarding agricultural produce) there are only a very few institutions worth mentioning, viz., those at Pusa, Lyallpur and Cawnpore.

(ii) In such a vast country which is wholly dependent on agriculture, there is a pressing need for the extension of teaching facilities in every place, but the North-West Frontier Province where, though nature is bountiful the ignorance of people is deplorable, there is greater need for teaching facilities in all the districts of the Province as none exist in the Province.

(iii) Teachers in rural areas must be drawn from the agricultural classes. Teachers from non-agricultural classes have proved inefficient and unsympathetic with the village students. They have no taste for agriculture and

do the work in rural areas half-heartedly for pecuniary purposes only. Non-agricultural teachers feel out of place in passing their lives in rural areas.

(iv) Attendance at existing institutions is quite unsatisfactory, as could only be expected under the present circumstances, owing to the following reasons:—

(*a*) Long distances from their homes to the institutions.

(*b*) Heavy tuition fees and expenses at the institutions.

(*c*) In spite of so many complicated subjects at the institutions the result in producing and turning out efficient and competent hands for practical work is most disappointing. Those fortunate ones who got employment under Government are pulling on somehow or other, as all of them are dyed in the same colour, but others at their homes and on their holdings have cut rather sorry figures, thus producing a very bad effect on the minds of the public. Mostly the students are drawn from non-agricultural classes and others, who have lived in big towns, sons of big landowners who have never visited their estates even once a year.

(*d*) No help or encouragement is extended or given to zealous agriculturists by the officials (not even a one hundredth part of the respect and care bestowed on military people); hence everybody who can earn his living by any other possible means would never take to the cultivation of land. This profession is considered to be the meanest, and the poor cultivators of the soil are worse than untouchables; hence nobody pays any attention to the profession which is the least respected and the most looked down upon.

By adopting the following measures, I think the demand for instruction can be stimulated:

(*a*) Preference may be given in Government employment to the successful students of such institutions.

(*b*) No fees, or only nominal tuition fees may be charged, and lodging and boarding expenses should be kept down to the lowest possible limit.

(*c*) Special instructions may be issued to all the Collectors and officials to show clemency and respect to the successful students of such institutions who practise agriculture at their homes and to extend every sort of help to them; and preference may be given to them in all the official representations and social gatherings. On all tours the Collectors should hear the complaints of all the agriculturists and try to remove them then and there.

(v) To-day the main incentive which induces lads to study agriculture is Government service, as there is still a demand for qualified hands in the Agricultural Department in India and all the other branches of service have become overcrowded.

(vi) Students are not mainly drawn from the agricultural classes, I am sorry to say that the reverse is the case. No sifting enquiry is made by the officials in sending pupils to the agricultural institutions; only the statements of the pupils or their parents and the unauthenticated statements of irresponsible officials are relied upon.

(vii) There is vast scope for modification in the existing courses of agriculture. Now-a-days much time and care is bestowed upon theory (cramming the courses of B.Sc.) and quite inadequate time and little care upon practical field work. The result is that quite a number of *babus* with weak constitutions and spectacles are turned out, who are unable to stand the strain of practical agriculture in the fields. The educational system of India is very defective generally but the case of agricultural education is deplorable. The department as yet has not made up its mind what it wants to turn out from the institutions. Such students who come out from the institutions make themselves the laughing stock of practical farmers

They know well the theories and the scientific aspects of a thing, but of practical work they know nothing. Professors in such institutions are no exceptions to this, and the students take after their professors who are no better in any way.

(viii) (a) *Nature study*, (b) *school plots*, (c) *school farms*.—All of them are very useful and instructive for the students from agricultural classes, but it is very difficult for the students of ordinary schools to give adequate time and attention to these things along with the other innumerable subjects of the school. Agriculture may be made a special subject in lieu of other subjects, and only two other important subjects may be taken along with agriculture by the students, and from the remaining subjects he may be exempted. Separate plots should be allotted to separate groups in a school; prizes may be given for the best upkeep, management and produce of such plots, and these prizes given in large gatherings of officials, prominent persons and parents of the pupils. After deducting all the expenses of such plots the surplus income of the plots must be divided amongst the students who worked the lots themselves, so that they may think the plots their own, and this would stimulate their zeal and interest to a greater extent. They would come to know about preliminary agriculture in the lower classes, such as the time of sowing of each crop, the number of waterings required for different crops, the methods and importance of weeding and hoeing, the time of harvesting, the common pests and their remedies, the proper time for manuring and top dressing, harvesting, and other necessary operations. In this way, there would be a good farm attached to every school among the rural population, run by the students themselves. From time to time, the students should go out under a proctor of their own for excursions to study nature and also to see the condition of neghbouring fields and crops.

(ix) The careers of the majority of students who have studied agriculture are Government or State Service on the Government farms or institutions. Not even 3 per cent. of the students have started their own farms.

(x) Already discussed under (iv).

(xi) None, to my knowledge, anywhere. For certain, none in this Province as there has been no attempt to impart technical knowledge to agricultural students.

(xii) Among the rural population adult education can be popularised by establishing the night school system in the *hujras* (common gathering places) and starting demonstration and instruction farms at different places of importance, to show the adults how to work with improved methods, and the efficiency and economy which can be attained by using up-to-date implements such as inversion ploughs, reapers, harrows and hoes. They should be shown the condition of the crops at such demonstration farms, the laying out of the farm, and making straight water channels and courses, stables and houses, the arrangements on the farms, manure pits, etc. Such farms must be run economically, at the least expense possible and with the greatest possible income; otherwise they can never be popularised, as the main objection of zamindars is that Government spends more money on farms and does not care for income, and this they cannot afford. Short courses for giving instructions to adults on the farms on important things must be fixed.

(xiii) The administration of the institutions and farms in rural areas should be under the Revenue Department and they should be financed partly from the revenue and partly from the District Board funds. Night schools in rural areas can easily be run by the inhabitants themselves, with some small assistance from the District Board.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) Demonstration farms, distribution of good selected seeds, a ready market for agricultural produce

at reasonable prices without middlemen's profits, the introduction of the co-operative system amongst the cultivators, some respect shown to cultivators by Government officials, a ready hearing and prompt removal of their troubles; wherever such things have been done (though very rarely) they have been successful in influencing and improving the practice of agriculture.

(*b*) Field demonstration can be more effective if it is carried on under ordinary circumstances without unusual facilities given by Government, such as abundance of water and plenty of capital. It should be practically demonstrated that improved implements and healthy cattle are more economical and useful.

(*c*) There is general distrust amongst the cultivators, and they are shy to adopt any new thing, especially from the so-called official experts in agriculture. Successful students from the agricultural colleges should be induced to open their own model farms in villages. Unless the improvement is started from within, nothing useful can be done from outside.

(*d*) There is only one agricultural farm run by the Local Government for the Province at Tarnab, near Peshawar; this farm has been working for a score of years and is running at a loss; that is, the income of the farm is less than the expenses, including pay and upkeep of the farm, etc. Although it is a farm of over 200 acres, situated in the most fertile tract of the rich, copiously irrigated Peshawar Valley, on the Grand Trunk Road, some eight miles from the Peshawar Cantonment and one mile distant from the railway station, on the main line and having the best facilities one can dream of, it is not even self-supporting. No statistics have been issued in any year, to my knowledge, to give the exact figures of income and expenses. To do justice to the farm, it is the tidiest and the most neatly and beautifully kept small farm in all India. It has well-trimmed borders of durantha, oranges, etc., straight and faultless roads, throughout the whole area, and not even a single stray straw would be found; clean stables and sheds, storeroom cemented, and innumerable nice things would be found by a visitor at the first glance; but what have the poor cultivators of India to do with it? If they came to know at what expense these things are kept going on they would put their hands to their ears. With money, wonders could be performed and it is no credit. The cultivators require the highest net income from an acre. To get Rs.500 from an acre after spending Rs.450 over it is no better than the income of Rs.200 from an acre after spending Rs.50 over it. Cultivators are never attracted and benefited by the demonstration of innumerable labourers daily working at the farm, the magnificence of the buildings, the godown, stables, compounds, poultry farm and decent roads. These things have disappointed the zamindars of the Province, and there is a general opinion that the farm is running at a loss, and this adds to the already existing shyness inherent amongst the cultivators. This only goes to accelerate the failure of demonstration and propaganda work. The net saving of an ignorant cultivator with the old-fashioned land-scratching implements and poor and wretched cattle per acre is greater than from an acre of such farms. These are my conclusions based on personal observation for a considerable period.

QUESTION 4.—ADMINISTRATION.—(*a*) There are Local Governments whose activities for the advancement of agriculture are practically nil, hence such things cannot be supplemented by the Government of India. Greater activities on the part of the Government in India is the only means for the advancement of agriculture.

(*b*) Yes, by increasing the scientific staff of the Government of India, the expert scientific knowledge required in the development of agriculture in different Provinces could be supplied to a greater extent than is the case

at present. The services of experts could be beneficially pooled for the following types of work:—

(1) Dry farming.
(2) To remedy waterlogging.
(3) Agricultural Engineering.
(4) Entomology.

(5) *Veterinary science.*—This work should be controlled by the Agricultural Department.

(*c*) (i) I am not satisfied, from the agricultural standpoint, with the services afforded by the Agricultural Service, because nothing material has been done and no extraordinary help or advice given to ordinary cultivators to enable them to achieve better results. Even the improved implements have not been popularised by the department. The Veterinary Department has named and found out the different diseases of cattle, but up to this time no effective remedies, except killing and burning or burying the carcases, has been found out in the case of many diseases. Veterinary hospitals are mostly in big towns and not in rural areas and at such long distances that the cultivators are hardly benefited.

(ii) Railways are insufficient to meet agricultural demand. Big markets, important towns and military stations are connected by railways, but no attempt to connect important grain producing tracts has been made.

(iii) Practically, roads in India are nil. Even one district is not connected with the other by road for wheeled traffic. There are good metalled roads in big towns in cantonments, and one grand trunk road running from Peshawar to Calcutta.

(v) Posts.—In villages the post is delivered weekly and in rare cases bi-weekly, hence the cultivators generally are not in touch with the rates of produce and the news of markets and marketing. A letter would travel from Peshawar to Bombay sooner than a letter from one village of a Kohat district to another village of the same district.

(vi) Telegrams addressed beyond 4 or 5 miles of a telegraph office are treated as letters by post, and telegraph offices are only at big towns and cities; hence the same trouble is felt. I think the Meteorological Department is keeping up with the times. Post and telegraph offices should be opened in greater numbers at big villages in rural areas. Every village should be connected by metalled road to a big town or market for motor traffic to bring produce to the market in a short time and with less expense.

QUESTION 5.—FINANCE.—(*a*) The question of finance is the marrow of the poverty and misery of the cultivators in India. Cultivators may be convinced of the utility of improved machinery and implements, strong and healthy cattle, the use of fertilizers, tube-wells in dry tracts, underdrainage for removing *kallar* and waterlogging conditions, etc., but as they are poor they are unable to make use of the above named improvements. Hence expensive implements and operations of agriculture must be arranged by Government with firms on the system of small annual or biennial instalments, and these should be distributed to the cultivators and the instalments realized from them by Government. Short term credit for the landowners and long term credit for the cultivators is very useful. The interest should not be more than 6 per cent. per annum for such credits and the instalments should be realized along with the revenue through the revenue authorities.

(*b*) The *taccavi* system is very useful to the cultivators, but, as it is run to-day, it has become very injurious to the cultivators, hence cultivators cannot make full use of the Government system of *taccavi*. A cultivator who requires Rs. 100 as a *taccavi* loan has to take a *fard-nambarwar* of his holding from the village patwari, for which he has

to pay Rs. 5 otherwise he cannot take a *fardnambarwar;* and without this no application is entertained for *taccavi.* Then the petitioner goes to a petition writer who charges him Re. 1 for drafting the application for loan. Then he pays Rs. 2 to the *munshi* or *muharrir,* who takes applications for *taccavi* loans, and he puts up the application to the Revenue Officer. If the loan is sanctioned, then the order is not shown to the applicant unless he pays Rs. 4 to the reader or *Munshi.* After all these things have been done he goes to the Treasurer or *Siah nawis* to receive his money, and there also he pays Rs. 1. In this way he gets only Rs. 87 instead of Rs. 100 from the very beginning and if he requires money in the 1st of week of September he would hardly be able to get it in November or December. '*Dastaks*' are issued when the time of realisation of instalments arrives, thus putting the already crushed and miserable cultivator to more trouble. If all the above difficulties and stages are removed, and the Revenue Officer takes the amount of *taccavi* with him, to be distributed in the villages while he is touring, and he distributes the amount to cultivators known to him or to *lambardars* or *zaildars,* then the system would be very useful and the cultivators would make fuller use of it. There should be no important part to be played by the *patwari,* or *lambardar,* or *zaildar,* or the *muharrir* in the matter.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are:—

(1) Failure of crops on account of drought, pests, or hailstorms when there is nothing left for the family to maintain themselves.

(2) Litigation in civil courts, which is a very common custom and practice in this class.

(3) To meet marriage and death expenses.

(ii) The sources of credit are:—

(1) Village Banias; (2) Bankers in the city; (3) Banks; (4) Government system of *taccavi;* and (5) Grain merchants.

(iii) The reasons preventing repayment are:—

(1) Uncertainty of crops.—When the crop fails on account of one of the many possible mishaps, then the instalment or the whole debt is not paid and for the next year double the amount with interest cannot be paid by the cultivator.

(2) Disease.—On account of epidemics of malaria or influenza, or other diseases the cultivator is confined to bed and is unable to work his land to its full capacity; hence he is unable to pay.

(3) High rate of interest.—There have been cases on record in every district, e.g., Rs.1,000 is borrowed in 1906 and until 1926 Rs.40,000 has been paid to the moneylenders, and still the property is attached for Rs.13,000 for the original debt of Rs. 1,000 in 1906. The tangled net of compound interest is very difficult to comprehend.

(4) Cultivators are unable to get full price for their produce on account of middlemen's profits and their tactics.

(*b*) There should be some bar or check on village Banias and city moneylenders by some legislation such as the Moneylenders' Act. The present burden of the debt of agriculturists should be paid off from the money of Courts of Awards under District Magistrates and other heads of Government at reasonable interest, and the property released from the moneylenders' clutches; this amount may be realised with interest by instalments. Special measures are necessary to deal with rural insolvency, and to enforce the application of the Usurious Loans Act. The most important point is to facilitate the redemption of mortgages, because without land a cultivator is nothing.

(*c*) Yes. It is very imperative to take steps to restrict the right of mortgage and sale of cultivators. Unless there is an urgent necessity for a

cultivator to raise money, the land should not be allowed to be mortgaged or sold without the previous sanction of the Collector, who should institute a searching enquiry. Non-terminable mortgages should be prohibited as they amount practicaly to the sale of the land.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Subdivision of holdings can easily be stopped amongst Muslims by introducing the law of "*Waqfi-alal-awlad*" (gift to the descendants) and amongst non-Muslims special legislation with the consent of the communities should be passed, that the holding, without division, should go to the eldest male member of the family, and he should be responsible for the maintenance of the younger members of the family. There is no harm if big estates are divided, but it is very injurious to divide small holdings. No holding should be less than 10 acres.

(*b*) The obstacles in the way of consolidation are the hue and cry of the younger members of the family and the danger of the eldest member of the family not paying the due maintenance allowance to the other members of the family. If these things are safeguarded by special legislation, then I think the obstacles can be overcome. To the Muslims it is a religious injunction and they would be ready and willing to follow it.

(*c*) Yes. Legislation is necessary to deal with minors, widows with life interest, persons legally incapable of alienating and dissentients, and to keep disputes out of the court, as nearly all the income and even more than that is spent on disputes in courts.

QUESTION 8.—IRRIGATION.—(*a*) In this Province, Kohat and Dera Ismail Khan are nearly wholly devoid of new irrigation schemes; therefore it is necessary that perennial canals may be opened from the river Indus for the two districts. I think if a survey is ordered to be made, suitable places would be found out to dig canals from those places near Shadipur in Kohat district and Paharpur in Dera Ismail Khan district. There are inundation canals already working in Dera Ismail Khan district, and at such places, perennial canals can easily be arranged. A larger area of Kohat tehsil can be irrigated, if the mouth of Oblam Pass (which is about 200 yards in width) near Jangal Khel village is blocked by a strong dam. Thus the rain water from all the adjacent mountains on all sides would be stored and used for irrigation purposes. In my opinion this is an economical and useful scheme. The only obstacle to the extension of irrigation by wells, tanks, ponds and canals is the poverty of the cultivator. If these things are done at the expense of Government and the usual water charges are levied from the cultivators then all these things would be very useful. At least there is great scope for tube wells, big tanks, etc., in the district of Kohat. Kohat is the poorest district; one-seventh of its land is irrigated and the rain is uncertain throughout the year.

QUESTION 9.—SOILS.—(*a*) (i) Soils can be improved by green manuring, by suitable rotations, by using inversion ploughs and drainage.

(ii) Reclamation of alkali land can be done by carrying out under-drainage, or sowing such plants or crops which use alkali as a plant food. Uncultivable land can be reclaimed from waterlogging by under-drainage, and, if on account of scarcity of water, then by providing the means of irrigation.

(iii) Surface drainage system, that is, constructing channels to carry the water washing down from the hillocks or mountains or the adjacent lands would prevent the erosion of the surface soil.

(*b*) (i) The soils of Swabi and part of Charsadda tahsils in Peshawar district have undergone marked improvement since the opening of the Upper and Lower Swat Canals, and also on account of the silt deposited by irrigation water. The *banjar* and *barani* lands have come under extensive

cultivation; people have become prosperous, the population has increased considerably, and prices of land have risen from Rs.10 an acre to Rs.1,000 an acre.

(ii) The soils of Mardan tahsil and part of Charsadda tahsil in the same district have undergone marked deterioration after the advent of canals, on account of waterlogging. The lands did very well for a score of years, but now generally they are waterlogged. Lack of water and abundance of water are the causes of deterioration, and these are to be remedied.

(*c*) Making suitable arrangements in *barani* dry tracts for the means of irrigation, encouraging dry farming, and stopping canal irrigation for some time in the waterlogged tracts, are the suitable measures for reclamation of lands. Long term credits should be advanced by Government to cultivators who reclaim culturable waste or barren lands.

QUESTION 10.—FERTILISERS. — (*a*) Greater use could be made of natural manures. Artificial fertilisers are expensive and require some knowledge to use them, and hence the ordinary cultivators cannot use artificial manures and fertilisers. The following are the main directions for improvement:—

(1) Town night soil and sweepings should be completely taken out from the town by the municipal committees and stored at different places in pits made for the purpose in adjacent lands, and after this has rotted in the pits (covered when filled) it should be sold by auction. Drainage water should be taken out, mixed with water and used for irrigation purposes. The present method is very defective; more than half the manure is wasted and even this half is washed or evaporated away.

(2) In villages model pits for storing the dung and sweepings of the houses should be made at the expense of Local Boards, and others should be encouraged to make such pits for storing their manure to stop its wastage through water and air.

(3) Pasture grounds should be encouraged by Government for sheep and goats and cattle, if not for anything else at least for the sake of manure.

(4) Green-manuring should be encouraged. For a few years Government should not charge water rates on the crops sown for the purpose of green-manuring.

(*b*) No firm should be allowed to deal in fertilisers without a licence or permit, and such licensed firms should be visited now and again, and the samples of fertilisers analysed by chemical examiners from time to time. For this purpose special legislation may be passed. Fines should be imposed for any adulteration.

(*c*) The firms dealing in fertilisers should buy the standing crops of cultivators at different places where fertilisers could be usefully used, and then use the fertilisers as top dressing on the crops and thus show the greater produce and profit to the cultivators. Thus the cultivators would be induced and stimulated to use fertilisers. The cultivator may either be paid in cash or kind for the average yield of his crops, and the fertilisers used by the buyer, but the other operations of watering, cutting and threshing must be done by the cultivator himself so that by his own hands and with his own eyes he may see the greater produce.

(*d*) Considerable use of manures is made on the lands adjacent to big towns where vegetables are grown and on Government farms.

(*e*) The effect of manuring with phosphates, nitrates, sulphate of ammonia and potash manures has not been investigated by the cultivators in India. Firms and Government farm officials have been using and experimenting upon the manures and have found them useful, but the public is very shy to adopt a thing on the recommendation of firms or officials.

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(*f*) Keeping protected forest areas for every district, for the supply of fuel and firewood, and where there are no forests or mountains reducing the railway freight on imported fuel and firewood would discourage the practice of using cow-dung as fuel.

QUESTION 11.—CROPS.—(*a*) (i) Selection of seed, using improved implements and fertilisers and manures, weeding out, irrigating and harvesting at the proper time, and scientific methods of storage are the main suggestions for the improvement of existing crops.

(ii & iii) Introduction of new crops and distribution of seeds must be done by seed and demonstration farms for some years to come.

(iv) Local Boards should fix a few annas per head for every injurious wild animal killed by cultivators. From time to time big parties of cultivators and other villagers should go into forests where such wild animals abound to hunt as a pastime.

QUESTION 12.—CULTIVATION.—(i) The existing system of tillage is of old times and very defective. It is done by wooden land-scratching ploughs drawn by poor and miserable cattle. Cows, she buffaloes, camels and donkeys are also used in ploughing. Ploughing is only done once or twice at the time of sowing. Improved implements such as inversion ploughs, and better breeds of cattle should be introduced, and a greater number of ploughings should be given.

(ii) Different rotations are followed at different places and these rotations vary to such an extent that it is difficult to enumerate them. The customary rotation in this district is, on irrigated lands—wheat, maize, shaftal; and on unirrigated lands—wheat, fallow, *bajra* or *juari*.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—To my knowledge no measures are taken for the protection of crops from external infection, pests or diseases. The cultivators are very ignorant and the measures of protection are difficult to follow and adopt. It is important to take internal measures against infection at the very beginning of disease or infection. As in recent years, considerable harm is done to the crops in India. Special instruction in vernacular regarding which may be issued by the Agricultural Department can be easily followed by the cultivators and inexpensive and simple methods. Once the cultivators come to know the efficacy of such instructions they will gladly follow them in future.

QUESTION 14.—IMPLEMENTS.—(*a*) All the improved agricultural implements and machinery should be kept in stock at all the Government seed and demonstration farms in every district for sale and loan at moderate charges. The best use and working of these implements may be demonstrated to the cultivators. When the cultivators are assured of the utility they will buy the cheap implements and will take expensive machinery on loan. The difficulty is that the ordinary cultivators are ignorant of the working of such implements and machinery, and if the implements get out of order there is none to repair them. The simplicity of the *desi* plough appeals to them more than a more useful but complicated machine or implement. The cultivators should be trained in the use of them, and the village carpenters and blacksmiths should be trained in the repair of such things. The cultivators should be induced to co-operate in a body and buy expensive machinery jointly. The whole village thus would utilise the machinery. To induce co-operation amongst the cultivators is the burning question of the day. Private farms on the model of Government farms should be encouraged, where all the improved implements should be used. More useful implements and machinery should be given to big landlords free for trial for some time, but only to such landowners who are enterprising and zealous and likely to buy and use them. At present there is no sale of agricultural implements throughout the country to any considerable extent, hence there is no competition amongst the manufacturers in India to produce better and cheaper implements. The cultivators object to the use of implements because a strong pair of healthy cattle

is required to work such implements, and such cattle are very few and are scarce with the common cultivators in India. Efforts should be made to improve the condition of cattle. There are places where the cultivators have not even seen or heard about the improved implements; hence travelling agents should be employed by the manufacturers to go out into the rural tracts and demonstrate the use of such implements to the cultivators on their own lands. By following this suggestion the implements would soon be popularised.

QUESTION 15.—VETERINARY.—(*a*) The Civil Veterinary Department should be under the Director of Agriculture.

(*b*) (i) Yes, there are dispensaries under the control of Local Boards, but this system is not working well.

(ii) The need for expansion is not adequately met.

(iii) I would advocate the transfer of control to agricultural authorities who are sympathetic with cultivators and keen on improvement.

(*c*) (i) Agriculturists do not make full use of the veterinary dispensaries, because such dispensaries are always at long distances from villages and much expense is incurred by agriculturists in getting their cattle treated in such dispensaries. Dispensaries should be in rural tracts and not in towns, and the Veterinary Assistants should tour frequently in their "Illaqas" with necessary medicines. Such dispensaries should be frequently visited by honorary non-official visitors and the complaints of agriculturists heard and removed. It is a general complaint that medicines are given very carelessly unless the Assistants are pleased.

(ii) Yes; where there are touring dispensaries full use is made of them.

(*d*) The owners of cattle suffering from contagious diseases would persist in keeping and grazing the cattle with other cattle, and would never consent to segregate them, and when such animals died would not bury the carcases or burn them; they would rather skin them, and in some cases would eat the flesh of such animals. Therefore, legislation for compulsory segregation, inoculation and disposal of diseased carcases is necessary.

(*e*) There is no difficulty in securing sufficient serum.

(*f*) The agriculturists, being ignorant and old-fashioned, are averse to and prejudiced against preventive inoculation, and if beyond this any fee is charged it would act as a deterrent. Once inoculation is popularised then a fee covering the actual expenses would not be objectionable.

(*g*) Yes; I consider that very little is done towards research into animal diseases in India, and provision of further facilities for research is desirable.

(*h*) I would advocate the setting up of provincial veterinary research institutions, and investigations should be conducted by research officers in the provinces.

(*i*) I do not see any advantage in having a superior veterinary officer with the Government of India.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) Healthy bulls must be distributed to big landowners by the Local Boards on condition that those landowners should feed and keep the bulls in good condition at their own expense and not charge any fee from the cultivators for covering their cows; likewise buffaloes and rams, &c. These may be kept with landowners or in every veterinary hospital in rural tracts. There is not even a single bull kept by the Local Board or Government throughout the district in Kohat; hence it is impossible to get a good breed in the district. The cultivators have become quite regardless which bull and of what kind covers their cattle. Cattle fairs must be encouraged in every district. Good pastures for every tract may be preserved for the grazing of livestock.

(ii) Artificial and adulterated *ghi* should be stopped by legislation, and for this purpose markets must be inspected from time to time. When there will be only consumption of pure *ghi* and butter there will be more demand

and more attention will be paid to the dairying industry. Separators of good and cheap types should be introduced. Adulteration of milk must be stopped, as there is generally a tendency to sell adulterated milk, and thus get more price by selling the milk than the butter from the milk. The provision of good pastures is most necessary. The best breeds of milch cattle must be introduced. At the present moment there is no check on adulterated milk or *ghi*. This should be looked into.

(iii) The existing practice in animal husbandry is so defective that there is scope for improvement on every side. Each cultivator should be induced to keep a sufficient portion of his area under cultivation under fodder for animals. Nowadays, as grain and other agricultural produce is very dear, every inch of land is put under crops for the market, and the animals are left at the mercy of natural resources. Other suggestions are the same as in (i) and (ii).

(*b*) (i) There are very few pastures left for grazing cattle as the aim is to cultivate as much land as possible. Barren, unirrigated, unculturable waste is left out of necessity, as they produce no grass, and cannot answer the purpose of pastures. Common pastures, if any, are overstocked, and no scruple is made of allowing cattle suffering from infectious diseases to graze with other cattle.

(ii) In my opinion grass borders in tilled fields are more injurious than useful, as it would be difficult to keep away cattle grazing the crop sown in such fields and also the weeds springing up in the fields. Enclosed pastures are useful and should be introduced individually at a fair distance from the cultivated fields.

(iii) Dry fodder, if kept and preserved by the cultivators, is sufficient for their animals, but as dry fodder, such as *bhusa*, *chari*, etc., is sold by the cultivators under the pressing need of money, after two months or so scarcity of fodder is keenly felt by them. For stocking *bhusa*, straw of maize, *chari* or leaves of pulses, etc., there is no efficient method in vogue amongst the cultivators. About half of it is lost by the crude method of storing and stacking. Cultivators are always optimistic and think that a good time is always approaching; hence they never prepare themselves beforehand for bad times.

(iv) Preserved green fodder can be used in the dry season when green fodder in the fields is absent and scarce.

(*c*) Fodder shortage is most marked in these districts during the months of January and February. Scarcity of fodder usually exists for six weeks. Young growing cattle begin to thrive in the months of April and May when there is plenty of *shaftal*, *berseem* and *khawid* (green wheat and barley). Five weeks must elapse after the shortage of fodder is over before young cattle begin to grow and thrive.

(*d*) *Berseem* and lucerne (*reshka*) can usefully be introduced in this district.

(*e*) If the Government take the initiative in the matter and grant some concessions with a view to encourage keener practical interest in these matters, and also if their officials impress the necessity on the landowners, then there is every hope of the landowners taking a keener interest.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) Eighty to 90 is the number of days of work done by an average cultivator on his holding during a year. Fifty-five to 60 days of work in the *rabi* season (ploughing, sowing, manuring, watering, reaping, thrashing, storage or disposal of the produce) and 25 to 30 days of work in *kharif*. For the remaining nine months in which a cultivator is slack he does other miscellaneous work, such as plying bullock-carts on hire, doing labour on roads and buildings, works in the factories or brings *mazari* (dwarf palms), grass or firewood from the mountains for sale in the market. There are some cultivators who remain

totally idle during the whole slack season, as they are either unable to get any work to do or are indolent.

(*b*) Poultry-farming, dairying, keeping flocks of sheep and goats, gardening, making articles of *mazari*, such as ropes, matting, baskets, etc., for sale in the market, weaving cloth by looms, making carpets and *dhurries*, bee-keeping, sericulture, pisciculture, lac-culture are the main subsidiary industries to occupy usefully the spare time of the cultivators and their families. Government may usefully establish ginning factories, rice hulling factories, sugar factories, flour mills, pressing machines for grass and *bhusa*, and cotton and other industrial factories in rural tracts where the cultivators may find work in the slack season. For the above enumerated industries Government may advance loans on the *taccavi* system to enterprising and intelligent cultivators as the average cultivator is always poor and indebted and is unable to start anything.

(*c*) The obstacles in the way of expansion of the above enumerated industries are (1) ignorance, (2) lack of capital or funds, (3) lack of co-operation and enterprise, (4) absence of a suitable market for such produce generally. Small institutions should be established in rural areas to impart instruction and knowledge regarding such industries, and *taccavi* advanced to such successful and keen cultivators who may be fit to carry on the industry.

(*d*) Yes, the Government should do more to establish industries connected with the preparation of agricultural produce for consumption, as all the cultivators would then be employed in the slack season and such preparations would be more economical and easy and useful.

(*e*) Yes. All the industrial concerns should be moved to rural areas. Besides giving subsidiary employment to cultivators, the removal of the industrial concerns to rural areas would bring the rural population into touch with civilization. Better roads, post offices, and better means of conveyance which these concerns would involve would be established, with towns for commercial as well as agricultural purposes. Such concerns at big cities and towns should be discouraged on the plea of insanitation and nuisance to the public, and in villages the co-operative system might be introduced for such concerns. Such concerns should be visited and audited by Government officials, and a part of the capital required for starting such concerns should be advanced to cultivators.

(*f*) Yes. A more extensive study of each rural industry in its technical, commercial, and financial aspects is very necessary, as ignorance is the chief impediment to the introduction of rural industries and improved tools and appliances.

(*g*) If arrangements are made to buy all the things prepared by the rural population as soon as they are ready it would act as a great stimulus in encouraging such employments. Every year exhibitions of such industries should be held at different rural tracts and prizes fixed and distributed.

(*h*) The people are so ignorant and bigoted that they would never accept help from outside for the betterment of their environment, not to mention devoting their spare time for improving their health and environments themselves. They do not even know the methods and means of improving the same. My village, Jangal Khel, is about 500 yards from the cantonment, and there are ponds and ditches and heaps of manure all round the village where mosquitoes are always breeding. The cantonment authorities employ their own mosquito-killing gangs to sprinkle disinfectants such as kerosene oil on the surface of the water and to fill up the ditches, but the ignorant cultivators are in their way. They are afraid that Government wants to spread some disease by this poison so that the population may decrease and the surplus population from England may be imported into India. Do what one will, it is not an

easy job to remove their nonsensical ideas. The cantonment authorities want to destroy all the mosquito-breeding places round the cantonment to save the cantonment itself from malarial attack. The first and foremost thing is to impart to the cultivators elementary knowledge in hygiene. The second thing is to proclaim an annual prize for the best hygienic village in the district. Nothing is done by the public without some stimulus such as money, and a little sum spent annually by the Local Board would do much.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) To build houses and to purchase cattle or other agricultural implements for the tenants or to advance loans to cultivators are the important measures to attract agricultural labour from areas in which there is a surplus.

(ii) If no share of the produce is taken from the cultivators by the owners of lands (cultivable waste) for three or four years, and if an agreement of at least ten years to cultivate the land is given, this would induce permanent migration of surplus agricultural population to areas where there is shortage of labour.

(*b*) Agricultural labour is short throughout the province, except in the district of Peshawar, and the causes are:—

(1) Absence of permanent source of irrigation in a great portion of the area, and uncertainty of rain throughout the year.

(2) Living is more dangerous and expensive than in the Punjab.

(3) There are no co-operative credit societies for advancing loans to cultivators at reasonable interest; hence the life of a cultivator is always miserable, more wretched than that of a labourer.

(4) There is no ready market for the sale of the produce. Lower rates are paid as the market is wholly in the hands of *mahajans*.

The above causes must be removed or modified.

(*c*) The areas not at present under cultivation may be given by the Local Government on long lease for a reasonable price to competent agriculturists who know something about modern methods of agriculture if the area is owned by the Government; if such areas are owned by private individuals then a time limit should be fixed within which they should cultivate and improve and reclaim such areas, and if the conditions are not fulfilled such areas may be given to those who can afford to develop them and to cultivate them on long terms of lease, and the lease money after deducting commission may be given to the owners of such areas.

QUESTION 19.—FORESTS.—(*a*) Forests are few and far between and much damage is done by persons to whom grazing facilities are granted on account of the mismanagement of the officials of the forest. Besides grazing cattle, grass and wood is cut green and sold in the nearest markets indiscriminately. I know the instance of Khawara and Zera forests in Nowshera tahsil where much damage has been done to an extensive, dense forest by the inhabitants of those places, with the result that there would be no trace of forest after a few years at those places. The grass and wood may be used by the people living there, but in no case should they be allowed to make it a means of living by selling grass and wood.

(*b*) Supply of firewood can be increased in rural areas by sowing quick growing trees for fuel on all the roads, water-channels and on the *shamilat* lands of a village, and also by protecting an area as a forest within every village. To increase the supply of fodder every cultivator should put one-sixth of his area under fodder crops.

(*c*) Yes; deterioration of forests has led to soil erosion, and the remedy is to encourage forests, which would also be useful for preserving the moisture of the soil and enriching it, bettering the condition of live-stock, giving abundance of milk and butter, more cowdung manure, better climate

and many other uses. There is scope for protecting forests in the neighbourhood of most villages. Forests are suffering deterioration from excessive grazing; thereby soil erosion is facilitated.

QUESTION 20.—MARKETING.—(*a*) Unluckily, Government has taken hardly any steps worth mentioning for facilitating marketing of agricultural produce, and it has entirely ignored its responsibilities to the agricultural community in this branch. Roads connecting rural areas with the markets for agricultural produce are very few and far between; therefore the existing market facilities are practically *nil*. Metalled roads connecting the most important towns and railways can be utilised, but they are inadequate and insufficient for the general demands of the rural population. Agriculturists are seriously handicapped thereby, and this is the most crying and urgent need of the agriculturists. It is time that Government took steps to construct suitable metalled roads throughout India connecting fertile rural areas with market places.

(*b*) With respect to the existing system of marketing and distribution, the condition of things is still more deplorable. The agriculturists of India generally, and especially of this Province, are ignorant, destitute, heavily in debt and lacking in agricultural knowledge and in facilities for disposal of their produce. The agriculturists are mostly compelled to sell their produce to the Banias (grain merchants) while the crops are standing green in the fields, at a rate fixed by the "Shylocks," who are earnestly undermining the very existence of the agricultural classes. It is, therefore, the Banias who come into possession of almost the whole agricultural produce at the time it is ready and harvested, partly in satisfaction of the heavy interest and debts and partly by purchases effected in the manner referred to above. It is, therefore, the moneylenders who have the system of marketing and distribution in their hands after the crops are harvested. The grain trade is a very lucrative one, and the prices of foodstuffs and other agricultural produce rise enormously after the harvesting time and continue to rise up till the next crops, but the poor farmer has nothing to do with the profit and the rise of rates, and, as mentioned above, he is deprived of selling his crops even at the rate prevailing at the harvesting time. The moneylenders do not stop even there; their activities are of a still more far-reaching character. The agriculturists are their ready and willing dupes, and the moneylenders have done enormous mischief both to the agriculturists and the land by having acquired the lands of the agriculturists at nominal prices. In the hands of the moneylender the land must deteriorate. It may, however, be mentioned that the introduction of the Alienation of Lands Act has put obstructions in the activities of moneylenders in the further acquisition of lands, but the Act has been delayed and is being delayed at some places, giving a very long time to moneylenders to commit ravages in the agricultural estates.

Ways and means for improvement may be suggested as follows:—

(1) Construction of suitable metalled roads.

(2) Imparting of suitable agricultural education, along with a knowledge of business in the trade of agricultural produce, to the sons of agriculturists and cultivators.

(3) Establishing agricultural banks and co-operative credit societies which may lend money to agriculturists at moderate rates of interest for the trade and improvement of agriculture on the security of landed property, thus saving them from the clutches of moneylenders.

(4) The time of collection of land revenue and *abiana* (water rates) should be extended for at least two months more than at present. Now the revenue, &c., falls due when the produce is hardly harvested, and no breathing time is allowed to the landowning classes. Therefore, the agriculturists are put to the necessity of selling their produce immediately at the very cheap rates fixed by the Banias for the purpose.

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The channel of marketing and distribution from the producer to the consumer in India, or the exporter in the case of produce exported overseas, is from the cultivator and agriculturists to the moneylenders or *banias* of villages to the grain merchants or traders of the towns in the market, and in case of overseas to the commission agents of the firms and from the firms to overseas. By this method only one-third of the price paid by the countries overseas goes to the pockets of moneylenders, traders, commission agents and firms (Intermediaries). Encouragement should be given to agriculturists to co-operate and establish their own firms dealing in grains and agricultural produce, thus saving the heavy margin of profit of intermediaries for themselves and thus bettering their condition. This can be done by giving financial and moral support to the intelligent and educated among the agriculturists. No service or assistance is rendered by any intermediary to the agriculturists who act both as commission agents and merchants for their own gains—always fleecing agriculturists.

Village Banias are financed by the moneylenders or traders of towns and they have money of their own, and in some cases are financed by banks, but mostly they are capitalists themselves. The system of barter is not much in vogue; it is found only in outlying villages, but is sufficiently harmful to the cultivators. When their whole produce is seized by moneylenders, or when their crops fail on account of hailstorm, drought, &c., and they are left grainless the cultivators borrow cheap grain, such as millet, maize, barley from village Banias or big landowners and promise to give equal quantity of wheat in return in the next year.

(*c*) The quality, purity, grading or packing of agricultural produce can be improved by the following means:—

(1) By using the best seed, free from foreign seeds.

(2) The soil must be well ploughed, and after germination well weeded to be free from weeds.

(3) The threshing floors must be made *pucca* or threshing machines used for wheat and barley; and in the case of cotton it should be picked clean, stored and ginned with care, to be free from leaves, &c., and worm-eaten bolls of cotton, &c. Ginning machines may be introduced.

(4) Scientific stores for grains must be made.

(5) Pressing machines for reducing the bulk of cotton *bhusa* must be introduced on a large scale.

(6) Merchants and traders know all about the market conditions and Indian and overseas crop returns, and in the market they use their own special code in telegrams and cablegrams daily in towns, but the cultivators are quite in the dark and ignorant of the rates. There is not even a single paper or bulletin in India from which agriculturists can get such information. In current newspapers old unauthenticated, misleading information is issued sometimes to deceive the cultivators into selling their produce soon and at cheap rates. Bulletins containing such up-to-date information should be sent through schoolmasters, lambardars and patwaris to the villages weekly or bi-weekly. This must be done, as it is very useful to the agriculturists.

QUESTION 22.—CO-OPERATION.—(*a*) (i) Government may advance money at a low rate of interest to a co-operative body, and this amount with interest may be realised by equal instalments within 12 years from the date of advance. Rules and regulations can easily be framed by Government.

(ii) Some persons among the educated agriculturists must volunteer to visit rural areas and do the work of propaganda for co-operation. The second important cause of poverty of Indian agriculturists is lack of co-operation.

(iii) The capitalists may be persuaded to invest their capital in such co-operative banks for agriculture.

(*b*) (i) Credit societies have improved the status of agriculture, but they are quite insufficient in number and inadequate in capital. In the whole of the North-West Frontier Province nobody even knows the name of credit society.

(ii) Purchase and sale societies are the means to save the agriculturists from the clutches of merchants and traders, and also to save them the middlemen's profit. These societies would be very much useful to the cultivators, and most of their difficulties and troubles would be removed.

(iv) Societies for effecting improvements are also very necessary as the bulk of the agriculturists are poor and ignorant, and on account of lack of funds and knowledge no improvement can be effected on their holdings. Such societies may dig wells, send for new pumps and engines for irrigation and introduce other methods and means of improvement, and in compensation they may take a share of produce of such lands.

(v) Such societies are useful, but Indian cultivators would never consent to the aggregation of fragmented holdings. This is the last thing they would do.

(vi) Societies for the use of machinery are also important, as poor cultivators use old and expensive methods, and for their small holdings they are unable to buy machinery. Such societies would lend such machinery to poor cultivators on hire to do their work sooner and more economically.

(vii) Societies for joint farming if encouraged and recognised by Government are useful, but trained and well-experienced agriculturists only should be allowed to join such societies.

(viii) Cattle-breeding societies would be useful to cultivators as the live stock has deteriorated very much, and there is a general demand for good and healthy cattle.

(ix) Sanitary societies are also necessary to improve the health of the villages.

(*c*) Yes; unless legislation is introduced and enforced for all the above societies to be established there would be much opposition to their introduction, and many persons would not join for the common benefit.

(*d*) I have no personal knowledge of such societies working.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The existing system of education is very defective. This education only produces clerks. The agricultural efficiency of the people is not at all improved, as no endeavours have been made in this respect. The elementary school education should be such that knowledge of agriculture may be imparted to elementary students in simple vernacular by small instructive lessons, and the schoolmasters should be such who are efficient in agriculture and are from the agricultural classes. Middle-school education should also impart agricultural knowledge in a somewhat more concise and illustrated form. After middle-school education there is no need of agricultural education in every school or college. There are special colleges for agriculture to give agricultural knowledge for the students who are zealous to carry on agriculture. Arts colleges are by no means capable of giving higher agricultural education.

(*b*) Compulsory education in rural areas can never be successful as the small boys are mostly put by their parents to work like grazing of cattle, protecting crops from birds and injurious animals, etc. This is the reason why only a small proportion of boys in rural primary schools pass through the 4th class.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Men of capital and enterprise in agricultural classes are very few. Big landlords whose income per annum is above one lakh are spendthrifts and lacking in enterprise and even such landlords have no capital to command. Some (a very few in India) who have estates as well as capital are misers, whose love towards money is greater than every other thing and they hoard money instead of investing

it in the improvement of their estates. If the profession of agriculture is made a respectable and honoured profession by Government then many men of capital and enterprise will take to agriculture.

The capitalists are even uncertain about the success of the investment in improvements; hence they are unwilling to invest their capital. They are also under the impression that when they improve the estate by spending a large sum and the income per acre has increased, then the revenue and other dues will be increased by Government and after a few years of cropping the yield will diminish and the revenue will remain the same and ruin will ultimately follow. By removing the above obstacles and objections the owners of agricultural lands would be encouraged to carry out improvements.

Oral Evidence.

47,353 *The Chaidman*: Sayad Pir Kamal Gilani, you are from the Kohat district of the North-West Frontier Province?—Yes.

47,354. Your note is very full: I have just one or two points to ask you about. I see on page 57 in answer to our Question 1 on Research, you say: "The result of any research useful at Pusa may not be useful at Peshawar owing to the physical and climatic differences between the two places." That no doubt may be true, but is it not the case that one of the Pusa wheats is very widely grown in Peshawar?—Not everywhere in the Province.

47,355. What is the favourite wheat in this district?—In the Kohat district the red "Chauntra" is preferred to Pusa No. 4.

47,356. Your idea is that some research ought to be carried out by every Local Government?—Yes, because there are climatic and other differences.

47,357. In the matter of botanical research and also veterinary research which you mention later on, do you think that the time has come when this Province could afford its own research organisation, or do you think that it had better depend on research organisations in the Punjab?—It is better to form a research department here independently of the Punjab.

47,358. In answer to our Question 2 (iv) (c), on page 58 you say: "In spite of so many complicated subjects at the institutions, the result in producing and turning out efficient and competent hands for practical work is most disappointing." You do not think very much of the technical education?—I have been to Lyallpur College and I am one of the specimens of its students. I know a good deal of the theory, but in practice we are worse than the ordinary zamindar. The high courses of the B.Sc are crammed and most of the time of the students is spent on theory, and they come out as debilitated, weak and ornamentally spectacled, and cannot stand the sunshine and adverse climatic conditions which have to be endured in zamindari work.

47,359. Do you mean to say that Lyallpur did not suit you? Did it debilitate you in the physical sense?—No. The system of education was very complicated and although it took a very long time to go through it, the result was practically *nil.*

47,360. What was your record at Lyallpur?—I stood first in the Punjab.

47,361. *Prof. Gangulee*: How many years' course?—It is a four years' course now; then it was three years for the full course.

47,362. *The Chairman*: And you have found that of no help at all?—No; it is of help in giving verbal instructions only.

47,363. How much land do you own?—I own 100 acres of irrigated land and 1,000 acres of *barani* land.

47,364. Of these 1,100 acres how many do you farm yourself?—All the land is under my supervision; the land is leased out to tenants and I take half the share; that is the *batai* system.

47,365. Under the system of *batai* is it the custom of the zamindar to give any guidance in technical matters? Would the zamindar expect to have his advice listened to?—No, they are doing it independently of his advice, according to custom.

47,366. Would your knowledge acquired at Lyallpur not have been more useful to you if you had farmed some of your land yourself?—I am doing that myself.

47,367. How much are you farming yourself?—I farm 100 irrigated acres.

47,368. Is that not paying?—Not paying in comparison with the price of the land.

47,369. You are not satisfied with your results?—No, because I have not got the necessary capital to purchase improved implements and to invest in a good many other improvements.

47,370. Is it your suggestion that there should be more practical work and less theoretical work in Lyallpur?—Yes, that is so.

47,371. Let us see exactly what you mean by practical work?—For instance, I myself have passed in chemistry; I know the analysis of sugar. I know what its chemical composition is, and if an apparatus costing about Rs.15,000 is given to me I can prepare sugar. But when I come out of college, these experiments are of no use to me in practice, and I derive no benefit from acquiring this knowledge. So I say that practical knowledge is required.

47,372. No doubt it is inevitable that certain things which a man may learn at an institution may not prove of use to him directly at any rate. Do you think that you lack any knowledge which Lyallpur ought to have given you?—Yes, practical application of my knowledge. Only one hour was given for practical work and as many as 10 hours for theoretical work daily.

47,373. Do you think you lack practical experience on the purely technical side or on the commercial and management side?—On the commercial side, and on the side of management.

47,374. What have you to say about the type of student going in for instruction at Lyallpur? Are you satisfied with that?—Only five students are taken annually from this Province. Even these few are unable to pass the full course.

47,375. *Sir Ganga Ram*: Is that the limit laid down?—Yes.

47,376. And from the States two?—Yes.

47,377. *The Chairman*: I was thinking of your criticism on page 58 where you say: "Students are not mainly drawn from the agricultural classes. I am sorry to say that the reverse is the case. No sifting inquiry is made by the officials in sending pupils to the agricultural institutions, only the statements of the pupils or their parents and the unauthenticated statements of irresponsible officials are relied upon." Is it within your knowledge that persons represent themselves as being of the agricultural and rural classes when, in fact, they are not so?—Yes, I have seen many of my class-fellows who are of the non-agricultural class at Lyallpur.

47,378. *Sir Thomas Middleton*: In what year was that?—I passed in April, 1914.

47,379. The number of students was very small then?—Yes, it was only about 18.

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47,380. In 1914, what was the number of passes?—Only about 12 passed.

47,381. *The Chairman*: On page 59, in answer to our Question 2 (xii), you say: "Among the rural population adult education can be popularised by establishing the night school system in the *hujras* (common gathering places) and starting demonstration and instruction farms at different places of importance." Have you any experience in the matter of setting up a night school?—Yes, all the people of the village gather in *hujras* and they pass their time by talking on different topics, about zamindari and so forth. It would be most useful to start a system of night schools and give short lessons in agriculture to adult persons.

47,382. Are they literate?—No, the bulk of the public is not literate.

47,383. Would you start with a course designed to impart literacy, or would you begin straight away with the demonstration?—I would begin straight away; to wait for education to be imparted to them would mean waiting for several years.

47,384. You mean, by means of magic lanterns and lectures and so on, hints in agriculture and farming might be given?—Yes.

47,385. Would you turn to page 61 of your note where you are dealing with the question of *taccavi* loans; a cultivator requiring Rs.100 as *taccavi* would have to pay Rs.5 for *fardnambarwar*?—Yes, if anybody applies for a *taccavi* loan of Rs.100 he hardly gets half of that sum at the end, and even this money he spends by visiting the city. So much goes in paying for his food, a portion also goes to the patwari and other officials, so that he hardly gets Rs.50.

47,386. What is a *fardnambarwar*?—It is a statement of the land.

47,387. You say that before he takes a "*Fardnambarwar*" he has to pay Rs.5. Is that an entirely legal charge?—It is illegal.

47,388. And without that no application is entertained for *taccavi*?—No application is entertained.

47,389. Is that universal?—Yes.

47,390. When he has paid his Rs.5 and he has had his papers examined then he gets his loan recommended?—He pays the petition writer to draft the petition for him.

47,391. How much of the Rs.100 does he get in his hand?—Only Rs.50, and when he is on his way home, which may be some 12 or 15 miles away, he buys something for his children and his wife, and in that fashion he spends the whole sum.

47,392. So that he cannot blame anybody except himself?—That is the system.

47,393. Do you tell the Commission seriously that a cultivator who gets a *taccavi* loan of Rs.100 would not handle more than Rs.50?—In some cases he may get more than that.

47,394. You do not think that is an exaggeration?—No.

47,395. I see on page 63 of your note, in answer to our Question 7, you say that the subdivision of holdings could be stopped amongst Muslims by introducing the law of "*Wagfi-alal-aulad*" (gift to the descendants). Do you think that public opinion amongst Muslims is in favour of that?—I think myself that the religious people would do it very gladly, because they would not sell or mortgage or gift the property to anybody else in such case.

47,396. Would you turn to where you deal with our Question 8 on Irrigation on page 63. Have you experience of land which has been water-logged as the consequence of irrigation?—Not in Kohat district; in Peshawar, Charsadda and Mardan tahsils there are water-logged lands.

47,397. Have you any minor irrigation schemes in the district, that is, small *kutcha bunds* across mountain streams and things of that sort?—Yes; in Kohat there are *kutcha bunds* and *kutcha* water courses coming down from the mountains during the monsoons.

47,398. Have you wells?—Plenty of them.

47,399. How much below the surface is the water level, as a rule?—Thirty to 40 feet from the surface.

47,400. What is the lift? The Persian Wheel?—Yes.

47,401. On page 66 you give us some views about the veterinary dispensaries; you are not very well satisfied by the way in which these institutions are managed?—That is so; the dispensaries are at a very great distance from the villages, with the result that it would cost a lot of money for the cattle of the zamindar to be taken to the dispensary which may be some 12 or 15 miles away, and then again to feed the cattle in the city, which means the spending of a lot of money.

47,402. You say, "It is a general complaint that medicines are given very carelessly unless the Assistants are pleased." Do you mean to suggest that unless the cultivator bribes the Assistant the Assistant gives the medicine in such a way as to do harm to the cattle?—There is no sympathy and no supervision in the dispensaries.

47,403. What do you mean by the words "unless the Assistants are pleased"?—Yes, unless they are pleased they do not give good medicines.

47,404. *Mr. Calvert*: Do you mean *khushamid*?—Yes.

47,405. *The Chairman*: Would you turn to page 69 where you are dealing with our Question 19 on Forests? You say, "Forests are few and far between and much damage is done by persons to whom grazing facilities are granted, on account of the mismanagement of the officials of the forest." What damage is done by persons?—Smuggling is going on.

47,406. What is the damage that you speak of?—Formerly, that is, 10 or 12 years ago, there were dense forests, but now there seems to be no forest at all.

47,407. Do you mean that deforestation has taken place?—Yes.

47,408. Any erosion?—On account of deforestation erosion is bound to occur.

47,409. Is that, in your view, a reason for closer supervision on the part of the forest authorities?—Yes, the cutting of firewood and grass should be stopped for at least five years so that new plants may be allowed to grow.

47,410. The district has been overgrazed and the trees have been lopped for firewood. Have the growing trees been lopped for firewood?—Yes; there is much lopping of trees for fodder for cattle and goats.

47,411. And for being sold in the market?—Yes, as fodder and fuel.

47,412. *Sir Ganga Ram*: Is that with the permission of the Forest Department?—No, that is done by smuggling.

47,413. *The Chairman*: How many times do you plough your own land of 100 irrigated acres before sowing your wheat?—From four to five times.

47,414. With a *deshi* plough?—No; the ordinary cultivators are averse to using the Raja plough, but on my 100 acres I use the Raja plough.

47,415. How do you farm? By paying for the labour?—By taking a half share.

47,416. *Sir Ganga Ram*: Where is this land of yours?—In Kohat.

47,417. You say you have got 1,000 acres of *barani* land. Why is it unirrigated? Is it uncommanded?—It is situated some 250 feet above the level of the river Indus.

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47,418. You say there are wells also?—Yes, but not at that place.

47,419. You cannot irrigate that land by wells?—Not that land; I have gone down to 230 feet without finding the water level.

47,420. What is the price of the irrigated land there?—It ranges from Rs.300 to Rs.1,000 per *jerib*, that is Rs.600 to Rs.2,000 per acre.

47,421. And yet you say that the land does not pay?—Yes; if you invest these large amounts on some other business you will get a better return.

47,422. What is the gross value of the crops grown on 100 acres of irrigated land?—Say, about Rs.6,000.

47,423. In other words, Rs.60 an acre?—Yes.

47,424. Are these forests a source of help to the people who are near about?—Yes. The Forest Department are not against the people, but the people do a lot of smuggling from the forests.

47,425. You say that when you were at Lyallpur you did not receive enough practical training. For how many hours a week were you supposed to receive practical instruction?—Seven.

47,426. Was it not the custom that those students who were anxious to obtain further instruction were permitted to go on the farm?—There was no time left for that.

47,427. I have had a good deal to do with teaching students practical agriculture in my time and I have often found that the best students were very lazy and would not go on the farm; they always complained that they had no time, and so on?—The college time was 8 a.m. to 4 p.m., and there was a recess of only one hour for food, and then after that there was tennis or hockey so that there was no time left for going and doing practical work in the fields.

47,428. You yourself must have known a good deal of practical agriculture before you went to Lyallpur?—But it did me no good at Lyallpur.

47,429. I suppose you took a course with the object of securing service?—No, I left service altogether; I served only for three months and then left of my own accord. I was an Agricultural Assistant.

47,430. *Sir Henry Lawrence*: You were bound to serve for five years, were you not?—Yes, because I had obtained a stipend.

47,431. How did you get clear of that agreement?—I thought my own farming would be more beneficial to me than service.

47,432. *Sir Ganga Ram*: You refer here to Lyallpur students being a laughing stock. Where have you heard of students being a laughing stock? Are you thinking of yourself or of other people?—That is my general impression about almost all.

47,433. Then you give us a figure and say that only 3 per cent. of them are working on their own farms. How did you get that figure?—I am in touch with the old students.

47,434. And only 3 per cent. of the Lyallpur students have farms of their own at the present time?—Yes; that is a figure given to me by the Old Students' Association.

47,435. *Sir James MacKenna*: Did you actually do any ploughing, harrowing or any other agricultural operations before you went to Lyallpur?—No.

47,436. Have you done anything since you came back from Lyallpur?—No.

47,437. Then how can anybody teach you practical agriculture?—No lessons in practical agriculture were given in the College and naturally when

I came back I was not going to take lessons from the ordinary cultivator; I did not want to show him that he knew more than I did.

47,438. Have you kept in touch with the college?—Yes.

47,439. Are you aware that the course has been changed a good deal lately and that they are laying more emphasis on the practical side?—That may be the case.

47,440. We were told that unless a student passed in practical agriculture he was failed?—That may be the case now, but then questions in practical agriculture were only elementary and easy to answer.

47,441. *Professor Gangulee*: What prevented you from putting your hand to the plough after you returned from Lyallpur?—Because this profession is not considered to be a noble profession in this country, and moreover I was not an expert in it.

47,442. One can only be an expert after he has put his hand to the plough. You complain that there was no practical work in your College. I want to know what prevented you from putting your hand to the plough when you started farming?—Ploughing is not the only practical work, there are a good many other practical things to do as well.

47,443. Then what prevented you from doing all those good many other things that you speak of?—I was not an expert.

47,444. But you left in 1913 and this is 1927?—If I have made any progress it has occurred after my leaving College.

47,445. What practical experience have you gained during these past 14 years?—I know the running of a farm, what manure should be used, what rotation should be followed and things like that.

47,446. Have you at any time ploughed with your own hands during these 14 years?—No.

47,447. *Mr. Calvert*: Do you think the cultivators of Kohat District are now prepared to take to co-operation?—Yes, they are quite prepared; that is the crying need of the cultivators of that district.

47,448. Do you think that they could be taught to run it and that it would be quite popular?—Yes, I think so.

47,449. *Mr. Kamat*: Is it quite indispensable that you should put your hand to the plough in order to make agriculture a success?—It is necessary to some extent that we should know practical agriculture better than the ordinary man.

47,450. That means the business side of agriculture?—Yes.

47,451. Do you mean to say that planters in this country (I mean European planters) ever plough with their own hands?—Not by their own hands, but if they are experts in it, so much the better.

47,452. Well, then, to make agriculture a success do you say it is necessary that one should know how to plough oneself?—It is not quite necessary, but you must be in the field and be able to look after the business side of the management, to manage the labour, to see to the rotation of crops, the seed and other things.

47,453. *Sir Henry Lawrence*: When you give out land on *batai*, do you decide what crops shall be sown or does the tenant do that independently?—That land which is under my direct supervision has got to be sown according to my instructions.

47,454. You say you cultivate 100 acres yourself?—Yes.

47,455. You cultivate them on the *batai* system, do you not?—Yes.

47,456. Do you direct the tenants what crops to grow?—Yes; in the case of those lands which are adjacent to the city, and where I can go

easily, I give them instructions to sow vegetables or sugarcane or whatever it may be and I make a rotation for them. I also give them manure.

47,457. Is the knowledge you gained at Lyallpur of no value to you in deciding those rotations?—Not compared with the time and expense spent in obtaining it. What has been of value has been the experience I have gained in these 14 years.

47,458. *Sir Ganga Ram*: You say this unirrigated land is 250 feet above the river?—Yes.

47,459. What is the fall of the river? 8 miles an hour?—I cannot say definitely, but it runs very fast. It may be 15.

47,460. Cannot you generate power from that?—I have never given my attention to the question.

47,461. Cannot you raise the water in that way?—It would require capital.

47,462. Do you know the method?—Yes.

47,463. It would soon pay you?—But where can I get the capital from?

47,464. Not much capital would be required?—At least Rs. 20,000.

47,465. If Rs. 20,000 will bring 1,000 acres under cultivation, will it not pay you?—If I could get Rs. 20,000 I would do it.

47,466. *Sir Thomas Middleton*: What did it cost you to go through the course at Lyallpur?—Rs. 6,000.

47,467. *The Chairman*: For the 4 years' course?—Yes.

47,468. *Professor Gangulee*: I thought you had a stipend from Government?—It was only nominal.

47,469. How much was it?—It did not cover the tuition fees. It was Rs. 20 a month.

47,470. For 4 years?—Yes.

47,471. *Sir Thomas Middleton*: This Rs. 6,000 came out of your own pocket?—Yes.

47,472. *The Chairman*: With regard to this *batai* system, has the proprietor any right to insist that his tenants shall follow rotations or other practices laid down by him?—He cannot insist, but if they resist they can be turned out.

(The witness withdrew.)

Mr. F. V. WYLIE, I.C.S., Settlement Officer, Peshawar District.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) None exist in the North-West Frontier Province.

(ii) There is no demand and I personally doubt if theoretical instruction on the subject is likely to improve the material condition of the people within a reasonable period of time. The practice as opposed to the theory of agricultural operations is already thoroughly understood.

(iii) and (iv) I am not in favour of the entertainment of teachers of agriculture *ad hoc* at all.

(viii) I consider that in the curriculum of every elementary school at least one hour a day should be set aside for nature study only. The object would be to stimulate the interest of the boys in the works of nature and to train them to observe.

School plots and school farms are unnecessarily ambitious. The village school is very generally held in the open air and the village fields, which are never more than a few yards away, are available for demonstration.

(ix) Government service!

(x) This is difficult. Two classes may be distinguished:—

(*a*) The son of the middle class townsman. He is unlikely ever to be attracted and he is not needed.

(*b*) The son of the yeoman farmer. It is an admitted fact that this type once he is educated up to, say, Matriculation standard tends to gravitate away from the villages. The causes of this may be sought in the following:—

(i) Complete absence of cultured social intercourse in the average village.

(ii) Non-existence of local political interests—no opportunity for local public service—no elected bodies.

(iii) The life of the agriculturist is a hard one and agriculture is not a trade at which money can be made quickly.

(xii and xiii) I would like to see a system of night schools instituted with travelling teachers who should be local men if possible. Classes would be held say once a week in the larger villages.

The subjects would be—

(*a*) Nature study, and

(*b*) Explanation of improvements in local agricultural practice which experience had justified the officers of the Agricultural Department in recommending for general adoption.

The teachers would be subordinate to the Agricultural Officer of the district and trained and paid by the Agricultural Department.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) As far as I am aware no single measure has so far in this district succeeded in influencing the practice of the cultivators.

(*b*) and (*c*) Field demonstrations to be effective must be carried out on a considerable scale in selected villages. The site chosen should be near a main road and a notice explaining the purpose of the demonstration should be erected in the field. Simultaneously the surrounding villages should be inundated with literature explaining the purpose of the demonstration and the advantages it is designed to bring within the reach of the farmer. The itinerant teachers whom I have mentioned under Question 2 (xii and xiii) would lecture with special reference to these demonstration plots.

The only effective way of convincing the zamindar is to grow a crop better than he can in his own village under conditions which he can have an opportunity of observing. It is useless to tell him that superior crops are grown at a Government farm which may be fifty miles from his village.

(*d*) The failure of such demonstration and propaganda work, as has so far been done, to influence the practice of the zamindar is admitted.

It is due in my opinion:—

(i) To a want of intensity in the work itself.

(ii) To the fact that every change of practice means expenditure—a new plough it may be or a rearrangement of the shape of fields—and this coupled with the natural inertia of the zamindar is sufficient to prevent the change from occurring.

Demonstration and propaganda must be taken up intensively and energetically and the zamindar convinced in spite of himself.

QUESTION 5.—FINANCE.—(*a*) Co-operative societies are manifestly the best medium for financing agriculture and Government should take steps to have these set up in every district where no organisation already exists.

(*b*) I am not in favour of any extension of the Government system of *taccavi*. It can at the best afford only infinitesimal relief, e.g., the annual allotment for this district is only Rs. 10,000 while according to the latest figures the total bill for secured debt in one tahsil alone amounts to Rs. 40,00,000. I do not believe that it is the duty of Government to find money for advances on the scale that would be necessary if substantial assistance to the zamindar by this method is to be assured. There are defects in the distribution of the money also—it is frequently not available at a time when money, e.g., for the purchase of seed and bullocks can be usefully expended. Subordinate officials make difficulties and expect douceurs. Long and repeated journeys to distant courts are usually necessary. The theory is of course excellent and the instructions on the subject are almost perfect in intention. The practice is unsatisfactory.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) I distinguish borrowings incidental to the business of farming from uneconomical debts incurred for other purposes. The first are inevitable in a country of small proprietors and in themselves not to be deprecated. The chief causes of the second are in my opinion:—

(i) Facile credit—in the last generation capital has accumulated in this country and in the absence of any alternative outlet for investment the money has gone into land. Among an uneducated people facile credit leads inevitably to increased borrowing.

(ii) False social standards—this is a common-place in the present connection and the point needs no elaboration.

(iii) Litigation including the exploitation of our court for the satisfaction of private grudge.

(*a*) (ii) The sources of credit are local—money is invariably advanced either by the trade or by the large owner. I know of no bank which invests its capital in loans to agriculturists.

(*a*) (iii) There are two sets of conditions to be considered:—

(i) In irrigated tracts failure to repay can only be due to the improvidence of the borrower. The returns from the soil here are practically secure and with reasonable care debts could be very quickly liquidated.

The agriculturist appears, however, from what I have seen of him to be a bad debtor and the point should I think be borne in mind when the rates of interest charged come under discussion.

(ii) In unirrigated tracts repayment must depend on the season. The reserves too are less here and chronic indebtedness is almost unavoidable for the small owner.

(*b*) and (*c*) Education and the extension of co-operative societies of all kinds are in my opinion the real cure. The spirit of self-help is to be fostered at all costs. I am opposed to protective legislation on principle—when introduced it should be used as a temporary expedient only.

QUESTION 9.—SOILS.—I discuss (*a*), (*b*) and (*c*) together. Since the introduction of irrigation from Government canals in the Peshawar district very extensive deterioration has set in in certain areas as illustrated by the following figures:—

(1) Charsadda tahsil—Shah Nahri Lower II assessment circle.

Cultivated area as recorded in 1895	9,837 acres
Cultivated area as recorded in 1926	9,330 acres

(2) Mardan tahsil—Kamalzai Janubi assessment circle.

Cultivated area as recorded in 1895	47,974 acres
Cultivated area as recorded in 1926	34,679 acres

The contraction in the cultivated area in these circles is due to one cause—water logging. I have made a series of representations on the subject which it is hoped may shortly bear fruit in the shape of a drainage

policy with a separate organisation for the protection and improvement of natural drainages. Compared with the Punjab generally the district is very favourably situated as it lies close to the hills, the slope is comparatively rapid and the entire area commanded by Government canals is served by a whole series of splendid natural drainages. My recommendations were to the effect that a detailed survey of the drainage lines be at once undertaken and a programme of clearance laid down. Concomitantly the people were to be encouraged to undertake the excavation of branch drainages. In the alignment of these and in every other way possible Government assistance was to be made available. I have also recommended a reduction of water rates in the areas affected until such time as the drainage improvements advocated have begun to have effect. The whole question is at present, I understand, before the Government of India for decision. I am convinced that drainage and irrigation must advance hand in hand; otherwise our much vaunted irrigation schemes will not last beyond a generation or two and the last state of the country which they serve will be worse than before irrigation was ever undertaken.

QUESTION 11.—CROPS.—(*a*) (i) The improvement of existing crops in this district must take the form of bringing improved seeds within reach of the farmer. Agricultural practice on irrigated land is generally quite superior, rotations are varied and sound and the farming for the most part of a high order for this country. As an instance of what can be done in the matter of seeds I would mention the fact that Pusa No. 4 wheat which was introduced into this Province by the Agricultural Officer, North-West Frontier Province, in 1916, has long ago ousted the old red bearded variety on irrigated land everywhere throughout the Province. The yield of this wheat is at least three maunds an acre on the average heavier than that of the old local wheats, and the increased returns to the farmers of the Province must therefore be enormous. It is not, however, enough to provide good seed: an organisation is necessary for maintaining a supply of that seed pure. I would have the travelling teachers recommended in my reply to Question 2 (xii and xiii) insist on the advantages of selection and they might at the same time act as distributors of pure seed. There should be a Government seed distributing centre at the headquarters of every tahsil as well—especially in tahsils where the bulk of the area has come under irrigation.

QUESTION 14.—IMPLEMENTS.—(*a*) and (*b*) For irrigated cultivation the country plough is inadequate. A cheap iron plough is available—the Raja. If this were brought into common use it would be possible to do with it much of the work which is now done by hand, e.g., inter-cultivation of sugarcane, maize, &c. The advantages of the Raja plough want advertisement and propaganda. I have recommended village demonstration plots in my reply to Question 3 (*b*) and (*c*). In these plots arrangements could be made for showing the Raja plough in use and leaflets could be published informing the people of its advantages. At the Government seed distributing stations recommended in my reply to Question 11 (*a*) (i) Raja ploughs might be on sale until such time as a demand was created when a supply would automatically become available. Other improved implements the advantages of which had been thoroughly tested at the Agricultural Department stations might be on show at the seed distributing station. If the people come to know of their existence—which is not the case at present—their general introduction can only be a matter of time.

As regards the more complicated type of modern agricultural machinery, e.g., reaping and threshing machines, I doubt if they have been experimented with sufficiently in this country to justify us in recommending them for general use. The advantages of the Raja plough have been proved over and over again and it would be a tremendous advance if it was brought into common use on irrigated land.

Mr. F. V. Wylie.

QUESTION 15.—VETERINARY.—(*a*) The Civil Veterinary Department should be under the control of the Director of Agriculture.

(*b*) Dispensaries here are under the control of the District Board and are inefficient. Funds are short and the need of expansion is ignored.

(*c*) Dispensaries should form part of the activities of the Agricultural Department and should be maintained by the Provincial authority. It is useless to expect efficiency from the District Board.

Oral Evidence.

47,473. *The Chairman*: Mr. Wylie, you are Settlement Officer of the Peshawar district?—Yes.

47,474. You have given us a note of your evidence. Is there anything you would like to add to that at this stage?—One thing I should like to mention is the afforestation of hills on the Border and another is the growing of trees on *kallar* lands under irrigation.

47,475. Taking first the afforestation, is that by way of preventing erosion?—Yes. There are two areas to be considered: across the Border and in the district. The supply of water in the Peshawar rivers depends on the forests across the Border, which are now being deforested.

47,476. By over-grazing?—By over-cutting, and perhaps by over-grazing as well.

47,477. Is the cutting for fuel?—No, the wood is brought down and sold in this district. In my opinion, unless that is stopped or controlled a time will come when there will be no water in these rivers except for a month or two in the summer.

47,478. The catchment area is narrow?—Yes. I can tell from the rivers that erosion is already beginning.

47,479. You think that the water will come straight down and that there will be a shortage in the dry season?—Yes. The rivers are carrying a much heavier burden of sand than they used to, and in one part of the district, where there is a complicated system of private canals, and there is only just room for the water channel, it is a problem where to find room for the increased quantity of silt that is coming down. Land is going out of cultivation simply to accommodate this extra silt.

47,480. Have you yourself seen signs of actual erosion?—No, I have not seen the actual trans-Border forests.

47,481. These forests of which you are speaking are across the border?—Yes.

47,482. How do you propose that we should remedy that state of affairs across the border?—In Swat, where a new Government has been started, in the terms we made with them there is a clause providing that we may introduce some forest control. In Dir it is much more difficult, but we have political control there, and some efforts should be made to introduce forest administration.

47,483. In any case, a policy could be settled on and put into effect as opportunity arose?—Yes, but, of course, where we have not complete political control forest control is difficult.

47,484. Are there districts within the Province where deforestation and erosion are taking place?—Yes. We have a proposal now that there should be a trans-Indus forest division. There are many areas where we propose to do afforestation. One is Sadhun; the other is a forest tract at present run by the Deputy Commissioner of Peshawar. What one of the witnesses this morning said about that is true: there is no control worth naming, and corruption is rampant. Government owns half the valley, but I do not

believe the people could live if Government separated out its half share and controlled that absolutely. I have therefore recommended that the new forest officer should keep the forest under supervision, and that control should be temporarily abandoned.

47,485. There again it is a matter of cutting down the trees?—Yes, and complete freedom of grazing. The browsing is the worst part of it.

47,486. *Sir Henry Lawrence*: With what object do you propose to abandon control?—The people must live. The margin of subsistence is narrow. On account of the inefficiency of the present administration, they have put a tribal fine on anyone who touches the undemarcated waste which is, under present arrangements, set aside for their use, and they use the Government reserve.

47,487. Are you speaking of Nowshera?—Yes, across the Cherat range in the south of Nowshera.

47,488. *The Chairman*: To give effect to these proposals for forest control a larger staff would be required than is at present employed?—We have no forest staff on this side of the Indus at present. The other point about afforestation I wanted to mention is whether trees can be grown on *kallar* areas. There is one such area which could be bought quite cheaply, and if properly planted could, I am sure, supply Peshawar Cantonment with fuel inside 10 years, and we might make a lot of money out of it.

47,489. Do you look to the trees to reclaim that land to some extent?—A certain amount of drainage will be necessary. I do not know whether shisham will grow there, but tamarisk will. If you go to Mardan you will see this area, as you will drive through it.

47,490. But is there a suggestion that the planting of trees, in itself, might do something to remove the salt?—I doubt whether they would grow without drainage.

47,491. You suggest growing these trees in plantations under irrigation?—Yes.

47,492. *Sir Henry Lawrence*: Would that be very expensive?—No. The Canal Department would probably give us favourable rates for water, and we might be able to intercultivate in the first few years and make money in that way.

47,493. *The Chairman*: To what extent is the Settlement Officer regarded in this Province as responsible for general economic welfare?—In every way. Everything which concerns the general economic welfare of the people it is his duty to bring to the notice of Government, if he has not to deal with it direct.

47,494. Are you engaged on settlement at the moment?—Yes. I have been for the last 3 years.

47,495. What type of village have you been settling?—Mostly irrigated, and of two types: those irrigated by private canals and those irrigated by State canals.

47,496. Do you notice any difference in the conditions in those two?—They are hardly comparable. In the case of private canals the lead for the water is very short, and there is practically no deterioration. The canals I am thinking of have been running for at least 400 years; they date from long before the British administration. The State canals are different; there has been a fair amount of deterioration at the tail of the systems in their case.

47,497. From waterlogging?—Yes.

47,498. Have you had salt efflorescence as well?—Yes.

47,499. *Kallar* as well?—Yes.

47,500. But in the older and smaller systems that is not apparent?—There is no deterioration anywhere; in fact, conditions are improving.

47,501. What do you find the average size of holding in these districts to be?—On irrigated land, 5 to 8 acres.

47,502. In most cases is no fruit being grown?—Very little in the district I have dealt with. Most of the fruit-growing is round Peshawar.

47,503. Can you estimate the net income of the cultivator from 5 to 8 acres of that type of land?—That would take a little time to work out, but I could let you have the figure.

47,504. I think it would be interesting to have your view. Perhaps you will let us have the gross income, and then show what deductions you make from it? Have you yourself carried out economic surveys in these villages? —Not in the sense in which that expression is used in the Punjab, but it is my duty to go to every village and see its position from an economic point of view.

47,505. What view have you formed of the indebtedness of the average cultivator in this district?—He is very heavily in debt. I have mentioned in my note that in one tahsil the total amount of the secured debt is Rs.40 laks.

47,506. *Sir Henry Lawrence*: What is the population?—1,64,000 people. That is the census figure for the total population.

47,507. *Mr. Calvert*: That is all mortgage debt?—Yes.

47,508. What is the cultivated area?—1,60,000 acres.

47,509. That works out at a little over Rs.100 per family?—Yes.

47,510. That is, taking the average family as five. It is 4·7 in the Punjab.

47,511. *The Chairman*: Have you formed any view as to whether indebtedness is increasing?—I can give you comparative figures for 1895 and 1926. In 1895 the total secured debt was Rs.8,58,000, while now it is practically Rs.40,00,000, an increase of five times in the last 30 years.

47,512. *Sir Henry Lawrence*: Secured on land?—Yes.

47,513. *The Chairman*: That is the mortgage debt?—Yes.

47,514. *Sir Thomas Middleton*: By what proportion has the value of land increased during those 30 years?—It is enormously more valuable now.

47,515. *Sir Henry Lawrence*: Has the value of the land increased more than five times?—I will give you exact figures. In the case of the Doaba Circle, which is practically all the same class of soil, the average sale price for the quiquennium 1890-4 was Rs.81 and for 1920-4 Rs.407.

47,516. *Sir Ganga Ram*: Is that for irrigated land?—It is all irrigated in that Circle, and has been for many hundreds of years.

47,517. *The Chairman*: Approximately, the mortgage debt has risen *pari passu* with the value of the land?—Yes.

47,518. In the villages in this district, has the *sowcar* usually the necessary resources to lend money, or has he himself to borrow?—I should think he has always enough money to lend, and that invariably he lends his own money.

47,519. It has been given in evidence before the Commission to-day by the Agricultural Officer that fruit-growing on a small scale by the cultivator on irrigated arable land is not proving a success and is not likely to prove a success. Do you agree with that view?—I think it is true, because he cannot arrange for packing and despatch; but if there were a co-operative sale society I think it might be possible.

47,520. Do you think that the natural instincts and tendencies of the people of this district are more opposed to the idea of combined action than

those, for instance, of the people of the plains?—Not in the least. I do not see why they should not take full advantage of every branch of co-operation.

47,521. No steady propaganda over any length of time has been conducted?—We have not attempted it in this district yet.

47,522. They have not had a chance?—They do not know what it means so far.

47,523. You point out in answer to Question 2 on page 80 that it is an admitted fact that the son of the yeoman farmer, once he is educated up to matriculation standard, tends to gravitate away from the villages, and you give a list of the causes of that tendency. Have you any constructive suggestions for the improvement of the school curriculum to prevent that tendency?—Very few. It is an almost universal tendency and not peculiar to India at all.

47,524. It is typical of rural populations the world over?—Yes. I think four or five years of education unsettles a man so far as farming is concerned, and he is not in the least likely to go back to the plough after it.

47,525. Does that mean that literacy, as imparted by the efficient primary school, would not be to the advantage of the cultivator?—It certainly would, but once they go beyond the primary school stage they never go back to the land; that is the trouble.

47,526. Literacy enables a man to keep his own accounts, to understand those kept by his moneylender, to read the literature provided by the Agricultural Department and so on, and it presumably makes a man more amenable to suggestions for the improvement of his agricultural practice?—Yes.

47,527. So that, broadly speaking, your idea is that education should proceed to the point of literacy and there stop?—That is what it amounts to. It ought not to be so, of course.

47,528. Are there middle vernacular schools in the district?—There is one at Charsadda, but the headquarters of these tahsils are usually big places and have an Anglo-vernacular school.

47,529. Have they any agricultural side at all?—I cannot say.

47,530. Have you formed any view of the possibility of imparting literacy to adults by means of night schools?—I have recommended that.

47,531. Yes, but have you any views as to the details of how it might be carried out? You are probably aware that in the Punjab the work was entrusted in the first instance to the co-operative movement, but that a stage has now been reached when the Education Department is taking it over. Do you think it would be possible to be certain that a demand for such a class existed in a village, before opening the class?—I doubt whether a night school would ever be a success in these villages for teaching people reading and writing. It is very difficult to imagine it.

47,532. Do you look forward to the day when there will be a wireless telephony receiver in all the villages in the district?—Yes.

47,533. It may come sooner than any of us expect?—Yes.

47,534. On page 80, in answer to our Question 3, you do not give us a very encouraging picture of the influence of Government farms. You say: "As far as I am aware no single measure has so far in this district succeeded in influencing the practice of the cultivators"?—The stress should be laid on the word *practice*. We have helped them in many ways, but their actual practice I do not think we have affected at all.

47,535. You give them credit for an improvement in the type of wheat grown and for fruit-growing and so on. That they have succeeded in?—Yes. In wheat there has been a tremendous improvement.

47,536. Do you get the impression that there is any demand from the cultivating public for assistance from the Agricultural Department?—Yes, undoubtedly.

47,537. They are becoming more aware of the possibility of being helped? —In every village in this district they appreciate that; certainly on the irrigated land.

47,538. On page 81 you say the agriculturist is a bad debtor. He is extraordinarily faithful to his bond is he not, in the long run?—He cannot get away from the courts; were it not for that I do not think he would be a good debtor. The Pathan proprietor, who is the man I know best, is extravagant and silly. If he has the money to repay his debt he may be tempted into some other way of spending it, and very probably will be.

47,539. Have you ever known the provisions of the Usurious Loans Act put into effect?—I do not know whether the Act applies in this Province or not.

47,540. My information is that it does. Having regard to the risks which the moneylender has to run in the ordinary way of his business, do you regard his rates as excessive?—His risks are not really very great, because generally when he takes land on mortgage he accompanies the mortgage deed with a lease deed, and he leaves the owner in possession and recovers his interest as lease-rent. He can then sue in the Revenue court for the recovery of his money.

47,541. And attach the crop?—He generally sues for a money value after the crop has been taken off the ground.

47,542. He does not sue to attach the crop?—He seldom acts in time. It is to his advantage not to, because he relies on the court being rather inefficient and giving him rates which have never been heard of, perhaps a year after the crop has been reaped.

47,543. It is sometimes suggested that the small cultivator in India would be greatly assisted by having placed at his disposal a large amount of capital on very easy terms. Do you agree with that view?—I think in these questions we ought always to distinguish irrigated from non-irrigated cultivation. I thought some of the witnesses to-day were confusing the two, but the conditions are absolutely different. On irrigated land, once a man is well started I do not see why he should ever get into debt. I consider the supply of water in this district is sufficient, and with 5 acres a reasonably steady man need not get into debt. On unirrigated land the conditions are utterly different; a man may not get a good crop for four years.

47,544. Do you notice a tendency for a man to borrow up to the limit of his credit?—Very much so. It depends on the individual, of course.

47,545. So that, presumably, education by co-operative or some other means should precede the provision of credit at much lower rates than those to which they are accustomed, or still further borrowing will result? —I take it a properly constituted co-operative society would refuse to lend, but I speak subject to correction there.

47,546. You would, I take it, attach great importance to the educative value of the co-operative movement?—Yes, very great; it is its greatest value, I believe.

47,547. You have probably heard other witnesses to-day deal with the question of *taccavi* loans. One witness told the Commission that in many cases as much as 50 per cent. of a Rs.100 *taccavi* loan was lost in various ways before the money actually came to the cultivator. What do you say to that?—I think it is a gross exaggeration, but a certain amount of that sort of thing does go on. The patwari charges for making out the list of field numbers which has to be filed with the application, and he is

entitled to do so. The witness spoke of it as an illegal charge, but it is not. The sanctioned charge is 8 annas per 100 words as far as I remember. That is the first point, the Rs.25 the witness mentioned. He said the patwari always got a tip as well. I do not see how you can stop that. The patwari is alone in a distant village when he provides the paper, and he undoubtedly does ensure that he gets something in addition to his legal charge. Afterwards there is a certain amount of small tipping which does not amount to bribery, and I refuse to believe that 50 per cent. of the money goes in that way.

47,548. Do you think the method of granting *taccavi* loans is needlessly complicated and irksome?—I think a simple rule would be that *taccavi* should never be distributed at headquarters. We have distributed Rs.3 lakhs in this district this year on account of floods in the autumn of last year, and my own officers distributed it when on tour. The patwari was made to present lists of the applicants' fields in the presence of the officer, and the money was paid to the man immediately. I do not think that degree of perfection is always possible when there is no settlement going on, but this year we distributed, as I say, Rs.3 lakhs in that way and only the tiniest fraction can have failed to find its way into the pockets of the zamindars.

47,549. *Sir Henry Lawrence*: Would it amount to one anna in the rupee?—I doubt it. The officer assessed the fee legally payable to the patwari, and it was recovered on the spot.

47,550. *The Chairman*: Is fragmentation a serious problem in any district?—It is an immense problem in this one.

47,551. In a dry area?—Not so much in a dry area, because the cartage for dry cultivation is a matter which is not very important; but with irrigation cultivation it is a very serious problem.

47,552. That is to say, quite apart from the inevitable sub-division there is needless fragmentation?—Yes. When the Pathans first occupied the valley they divided the villages into *vunds*, and every owner was given a field in each *vund*, and sometimes in two or three places inside that sub-division. Fragmentation has thus been heaped on fragmentation; the original holdings were fragmented.

47,553. Is there any consciousness on the part of the cultivators that fragmentation reduces their efficiency?—Every cultivator will admit it.

47,554. Is any consolidation possible in this Province?—Not without legislation.

47,555. There is no hope of achieving it through co-operation?—Co-operation might do it, but the last 10 per cent. of the owners are very hard to win over, and under the present rules we cannot do it without their consent.

47,556. Is it the case in most villages in this district, for instance, that the village lands are made up of very different classes of agricultural land, and that a man very often has a small share of each class of land amongst his various holdings?—Where you have wells, canal irrigation and unirrigated land in one village, the majority of the owners will nearly always own land in all three classes.

47,557. And land near the village is more valuable than land further away?—Yes. If we tried to consolidate these holdings we would have to exclude wells from the proceedings. We cannot consolidate well holdings; the capital invested is too great.

47,558. *Mr. Calvert*: It has been done?—I think it would be resented very much here. The tobacco grown in the Swabi tahsil is famous all over India; it is a most valuable product, and the wells there are immensely valuable.

47,559. *Sir Thomas Middleton*: They contain saltpetre?—It is due to something in the water, because the canal water is not so good for it.

47,560. *Professor Gangulee*: Is the area under tobacco extending?—Yes. It has extended immensely in the last 30 years.

47,561. The crop is exported out of the Province?—Not the best quality. There are three qualities grown here, and the best is usually sold locally in Peshawar city.

47,562. *The Chairman*: Have you noticed any change in the quality of the livestock in the Province since you have known it?—No, not in these three years.

47,563. Do you think that an improvement in the draught value of cattle would be a great contribution towards agricultural advancement?—It must be so; there must be an advance in the standard of the ordinary bullock before we can use iron ploughs. The average bullock is not fit to operate a Rajah plough.

47,564. Is it the custom with most zamindars to consume dairy produce in their diet?—Yes, the consumption of curds is very common.

47,565. Are they a wheat-eating population?—Wheat and maize are the chief grains they consume.

47,566. Would you say that the ordinary diet is a good and varied diet? —I think so; the people feed themselves well.

47,567. Is fruit eaten by the ordinary zamindar?—I should not think so.

47,568. Any vegetables?—Rarely; very often weeds from the fields are collected for use.

47,569. How do you mean?—Some of the ordinary weeds are eatable.

47,570. Do they not eat dried apricots?—No; they are very cheap, no doubt; but nobody seems to know about them.

47,571. Do they kill their own meat?—There is a village butcher always.

47,572. Have you formed any view about sheep farming: are there good prospects for that?—That would depend on whether arrangements could be made to feed them; as a result of the expansion of irrigation, grazing grounds have contracted; along the hills there is a good deal of open grazing ground left, but in the central parts of the district the reverse is the case.

47,573. In no case are they part of the ordinary system of arable farming, feeding on forage crops and manuring the land?—No; what they do is this: sheep dung is collected by placing all the sheep in a pen during the night; the dung collected is then sold as manure at a rupee a bag.

47,574. How about the marketing of the produce? Is that satisfactory, or the reverse?—I think it is quite satisfactory here. The communications are good and at places like Hoti there is a very active trade.

47,575. Do you form the view that the zamindar gets a reasonable share of the price of what he sells in the open market?—I think he does very well at present; but he could do still better if he were helped by the co-operative movement.

47,576. How about price levels, so far as the purchasing is concerned, in the villages for the necessities and even the little luxuries of life? Compared, for instance, with prices in this town and in the plains, is living in the villages very expensive?—I should not think that it is very much more expensive.

47,577. Very little, one supposes, is bought in the ordinary way in the villages, because they come to the big towns to buy?—Yes, that is so;

there are also banias for every village, but a lot of the marketing is done now in the central towns.

47,578. In general, is it the practice of the cultivator to store the grain which he requires for his own and his family's consumption?—Yes.

47,579. *Sir Henry Lawrence*: He sells and buys again, does he not?—I think he nearly always stores.

47,580. *The Chairman*: It is subsistence farming in the main that is practised?—Yes.

47,581. Are there many zamindars living principally on the money crop and so dependent upon purchase?—They nearly always grow sufficient grain crops to feed their families.

47,582. *Sir Ganga Ram*: What about cotton?—Cotton does not do well here.

47,583. *Sir James MacKenna*: With reference to the general economic conditions of the village in the districts you are settling, is there much emigration from those districts?—There is a good deal from selected villages, but otherwise there is no general tendency for emigration.

47,584. Those who do emigrate do send back a certain amount of money, do they not?—Very much so.

47,585. Does that help towards the well-being of the village?—Yes, but the amount is comparatively small.

47,586. What is the period of your settlement here?—It was originally sanctioned for 20 years in 1895. Then, on account of the war, it was extended. This is the third regular settlement of the district.

47,587. What is the basis of assessment?—Half the net assets.

47,588. Do you work up to that in practice?—Nothing like it.

47,589. What do you take in practice?—We have taken about 15 per cent. in some circles, and 30 to 35 in other circles.

47,590. *Mr. Calvert*: Of a cautious estimate?—Yes. I think you have got to build on what you find.

47,591. *Sir James MacKenna*: Is it correct to say that the Settlement Officer gets a sort of general impression of the economic conditions, of the paying power, of the village?—We keep elaborate statistics for every village, and it is the Settlement Officer's duty to go to the village and inquire from the people.

47,592. And you form a general bird's-eye view of his position?—Yes.

47,593. You work, I presume, under the Revenue Commissioner?—Yes.

47,594. How many settlements are going on in the Province?—This is the only one.

47,595. Who does the crop forecast here?—The crop forecasts go up from the Deputy Commissioner to the Revenue Commissioner.

47,596. Do you know what is the collecting agency?—The information is collected through the Tahsildars.

47,597. Is the map brought up to date every year?—It is supposed to be kept up to date.

47,598. Increases in cultivation or decreases are not assessed from year to year?—No; there is a fixed assessment, except where land is subject to river action, &c.

47,599. *Professor Gangulee*: Do you have many returned emigrants in your villages?—A sprinkling of them always; I should not describe them as many.

Mr. F. V. Wylie.

47,600. Ex-soldiers?—Yes.

47,601. Do you find any change in the social outlook or in other directions amongst these ex-soldiers?—I do not think so; after a year or two the ex-soldier in the villages is almost unrecognisable.

47,602. Apart from the pension they get, do they rely on any other source of income?—They have always had some land before they enlisted.

47,603. Do they farm themselves after they return to their villages, or do they give out the land on the *batai* system?—While they are away some relation, a brother, for example, always cultivates the land for them.

47,604. We were told this morning by the Agricultural Officer that he would like to have more demonstration farms in the Province, and you state in your note that the only effective way of convincing the zamindar is to grow a crop better than he can in his own village under conditions which he can have an opportunity of observing. Are you referring to demonstration on the farmer's own land under the direction of the Agricultural Department?—Yes, to be cultivated by him under our conditions.

47,605. You are, then, not in favour of having a separate demonstration farm?—No, there is no necessity for that.

47,606. We were told this afternoon by a number of witnesses that there is a great demand for agricultural education. Do you think there is such a demand amongst the sons of large landowners?—None at all, except as a passport for Government service.

47,607. We have also been told that one of the obstacles to progress in the agricultural development of the Province is the disinclination of large landowners to improve their respective holdings. Is that the case?—The wealthy man in this district, without exception practically, takes no interest whatsoever in his land; he simply eats up the profits.

47,608. I think the Agricultural Officer, with the help of an experienced Assistant, carried out an economic inquiry in the Peshawar district. Are you aware of that inquiry?—I believe I have seen those papers.

47,609. Do you think there is a need for an intensive inquiry in order to formulate a general scheme of rural development?—It would be advisable to have it if possible.

47,610. Reference has been made to the moneylending business. Who are the moneylenders of this Province? Hindus or Mahommedans?—The professional moneylender is invariably a Hindu in this district.

47,611. Do you distinguish professional moneylenders from the other classes?—The rich classes also very often lend money.

47,612. With regard to soil surveys, do you find that land under irrigation is going out of cultivation owing to saline efflorescence?—Yes, particularly in one circle in Mardan.

47,613. In other circles too?—To a certain extent.

47,614. Do you know of any deteriorated land which has been reclaimed?—No.

47,615. So that, once deteriorated, it remains in that condition for ever?—Not necessarily; drainage is wanted, that is all. We have constructed drains, but we have had no organisation for keeping them open. A permanent drainage organisation is essential.

47,616. So that if you had had a permanent drainage system, certain portions, at any rate, of these areas might have been reclaimed?—Yes.

47,617. *Mr. Calvert*: Do your figures show any tendency for cultivated agricultural land to decline in value?—None whatsoever; there may be a drop from the prices of 1920-21 but those were exceptional prices.

47,618. If a man wishes to sell, is there any difficulty in finding a buyer?—At the moment, in fact during the last year or so, that has been the case.

47,619. And what is that due to?—To the Land Alienation Act, in the first instance.

47,620. Is there in this district any considerable landless tenant class?—Enormous I should say. There were enormous areas of waste land and Government, by opening out two canals, brought many thousands of acres under irrigation. The existing population were fully occupied with wells, etc.; men were already required for work on these areas and the bulk of the population was found from across the border, with the result that there are very few tenant-owners in these areas.

47,620A. Are they Crown tenants?—No, the land is privately owned; there are no Crown lands in the district worth mentioning.

47,621. Have you any rough figure of the proportion of land cultivated by tenants?—I can give you the exact figures of the two tahsils I have finished. In the Charsadda tahsil 25 per cent. of the land is cultivated by owners; 5 per cent. is cultivated by occupancy tenants; 40 per cent. is cultivated by tenants paying rents in kind.

47,622. *Professor Gangulee*: These tenants are tenants at will?—Yes; and 27 per cent. is held by tenants paying cash rents. But they usually hold under middlemen lessees and pay the latter rent in kind; so the description of the cultivator here as paying cash rent is not quite accurate.

47,623. *Mr. Calvert*: So about 67 per cent. of this land is cultivated under conditions which do not really permit of improvement? The tenants at will cannot improve their land without the consent of the landlord?—By agreement with the landlord. This is a very rich tahsil as a matter of fact, and I do not know myself that cultivation can be improved in this tahsil; it is a splendid tahsil.

47,624. So that it is a waste of time inquiring about it?—I do think that is so with this particular tahsil.

47,625. Have you ever tried to work out the classification of owners under 1 acre or 1 to 2½, 5 and so on?—I can give the figures. In the Charsadda tahsil 4 per cent. of the total area is included in holdings under 3 acres; 3 per cent. in holdings of 3 acres and above but under 5; 7 per cent. in holdings of over 5 acres and under 10; 10 per cent. in holdings of 10 acres but under 20; 20 per cent. in holdings of 20 to 50 acres; 17 per cent. in holdings of 50 to 100 acres.

47,626. You have taken them in holdings, which may mean anything, because the same individuals occur over and over again. You have not abstracted them by owners?—No.

47,627. Even in a rich tahsil like this, do you think the smaller man, the under-five-acre man, has had a chance of improving his economic position?—I think he can make enough money to live on comfortably.

47,629. Not in what you would now call comfort?—I say comfort according to the standards in this country. They never think of coming to Peshawar on foot and they have plenty to eat. The crops in this particular tahsil are remarkably good, except for one tiny circle which is waterlogged.

47,630. Are these tenants who occupy 60 per cent. of the land shifting tenants or are they more or less semi-permanent on the land?—They shift very little, except on the bad land.

47,631. You do get tenants staying there for 50 years by holding on annual lease?—Yes, very often on sentimental grounds.

47,632. You are aiming at something like from 15 to 25 per cent. of the net assets of the land revenue?—Yes, about that.

47,633. That would bring the revenue to about 7½ to 12 per cent. of the gross produce?—If you take one-third, which is likely to be the new standard, the assessments imposed are 35 in one, 27 and 36 in another, and in another case it would be as much as 70 per cent.

47,634. You calculate your net assets with extreme caution?—I think that is true. The assessment compared with all the standards is very much below what might be taken theoretically.

47,635. You will get 5 to 10 per cent. of the gross produce?—Yes, about that.

47,636. This difficulty in recovering revenue, you say, is due to extravagance, not to the heaviness of the assessment?—The worst tahsil is Mardan where the assessment is a bagatelle, and where the water rates are the real trouble.

47,637. That difficulty is experienced chiefly with the very small owners, is it?—Our difficulty really is with our lambardars, not with the land revenue payees themselves; it is also due to irregularities in the tahsil.

47,638. The mortgage debt works out very roughly to about Rs.24 per total cultivated area. Have you worked out the figure for the total mortgaged area?—No. I can give you the mortgage value of a cultivated area. I can give you the amount of debt per cultivated acre. In one circle it is Rs.227 per acre, in another Rs.257, 138, 188 and 171.

47,639. That still leaves a considerable margin of credit to a man who holds an acre worth Rs.400?—Yes.

47,640. In this recent assessment, are you taking the same assumed out-turn of wheat as was taken by Sir Louis Dane?—No; I have assumed 10 maunds an acre; most of my wheat yields vary round 10 maunds.

47,641. I have been told by various people that in Peshawar there really is good scope for co-operative societies?—Yes, and they are urgently needed.

47,642. On this question of consolidation, an Inspector told me that the word to apply was not "impossible" but "difficult"?—We have got other much more difficult problems than merely fragmentation of holdings; we have got fields a yard broad and two miles long, running through country where wells could be sunk if we could only get them to partition.

47,643. I have found a good deal of misunderstanding with regard to this consolidation. The Royal Commission went to a village which took two years to consolidate. Do you think you can do consolidation here if you give the village two years?—We can do it in six months if we only have the staff.

47,644. By persuasion?—By persuasion it might take time. If legislation is effected it would be easy.

47,645. *Mr. Kamat*: You gave us certain figures about the debt 30 years ago and the debt now. You also gave us figures of the price of land 30 years ago and now. Can you give us figures of the prices of produce 30 years ago and now?—I have sent up my report, and I have not got the figures with me now; but I can show you the actual prices ruling 30 years ago and the actual prices ruling now, and the prices assumed for settlement purposes now.

47,646. Have you any rough idea? Is it four or five times?—I should think it is about 30 or 40 per cent. higher now than it was 30 years ago.

47,647. In your settlement operations do you assess revenue on the basis of the net produce, say 15 or 20 per cent. of it?—We do not do that; we

work on rents entirely. The whole theory of settlement work is based on rents.

47,648. That means you do not find out the revenue side of the cultivator's budget, nor the expenditure side?—We are not concerned with it at all; the tenant does not pay revenue.

47,649. I am not speaking of revenue in that sense. I am speaking of the term " revenue " in the sense of income?—We do not calculate that.

47,650. It is the economics of the cultivator's field which I am trying to find out from you?—Government assumes that half the assets may be taken to mean a full fair rent paid by a tenant at will.

47,651. As a Settlement Officer could you tell me whether you have tried to find out the total income of a man from, say, 5 acres of his land, including the produce of his wheat or, if he has any subsidiary income, the total income?—I do not think I have ever worked that out.*

47,652. Neither have you found out how the cost of production has gone up in recent years?—That was calculated rather roughly from the cost of cattle 30 years ago and the cost of cattle now.

47,653. And the cost of labour?—I have given the figures for that in these reports. It has about doubled in 30 years.

47,654. Taking these two (the total income according to the prices to-day and the cost of production according to the prices to-day) have you any idea whether the margin left to a farmer is on the side of surplus or on the side of deficit?—On general grounds it must be on the side of surplus, because he exists.

47,655. There again you go on assumptions?—Yes.

47,656. The whole of the settlement operations thus are based on two mere assumptions?—The estimates are all based on elaborate inquiries into prices and so on, but the theory rests on assumptions.

47,657. To a real economist, therefore, the settlement operations furnish no data as to whether the standard of the cultivator is going up or whether he has a margin?—We can give you the full statistics from which to make those calculations if you wish to have them. I have books here which contain all the figures required for calculations of that sort.

47,658. But you yourself do not give direct results by these methods?—No. I am not required to do that.

47,659. In the absence of such direct figures, mere reference to the price of land and the amount of secured debt having gone up does not help us to come to any conclusions with regard to the rise in the standard of living of the cultivator?—I should think not.

47,660. I think you told the Commission that when a moneylender goes to court he finds it rather difficult, owing to the inefficiency of the court and other factors, to recover his loan?—I did not say that. I said he recovered his interest as lease-money nominally in order to be able to bring his action against his debtor in a revenue court and not in a civil court, the former being much cheaper than the latter and somewhat quicker.

47,661. Does he find it rather difficult to recover his money in the revenue court?—It depends on whether the procedure of the court is speedy or not.

47,662. He can go to the revenue court, I think, only if he puts in his plaint within six months of the crop being cut, whereas in the civil court there is no such time limit, he can go to court after a year or two. With reference to unsecured loans, is it your experience that the moneylender has to demand a high rate of interest, having no security except the credit

* *Vide* Appendix on page 98.

of the man?—The rate of interest on unsecured debts is probably double that on secured.

47,663. With reference to fragmentation, you said you were in favour of legislation and not voluntary consolidation?—I am in favour of legislation to enable us to get something done, because unless you can get all the owners to agree you can do nothing at present.

47,664. If you have recourse to legislation, do you think the law will have to lay down a certain minimum limit for an economic holding, beyond which fragmentation should not be allowed to go?—I doubt if such a law would have any effect, because there cannot be anything to prevent people partitioning land privately amongst themselves, even if the law forbids them to do it.

47,665. If you have recourse to legislation, one of the clauses of such legislation will have necessarily to be that no man shall divide his land beyond a certain economic limit (5 or 10 acres, or whatever it may be), otherwise you will not be able to enforce the law?—I was thinking more of legilation empowering us to repartition.

47,666. Simply to help the settlement officers?—To help the Revenue staff generally if the existing state of tenure in a village makes repartition desirable.

47,667. Assuming (apart from settlement officers and repartition) legislation is introduced and an economic limit, say of 5 acres, fixed beyond which there should be no further partition, have you considered whether this will lead to displacing a certain number of people from the land?—I suppose it would ultimately, if the population increased.

Sir Thomas Middleton: It must.

47,668. *Mr. Kamat*: I will give a hypothetical instance to bring out the point. Suppose in a certain village there are 1,500 acres of cultivated land and 500 people engaged in agriculture. There is fragmentation, with an average holding of 3 acres. You wish, let us say, to introduce legislation fixing 5 acres as the economic limit; i.e., each family should have 5 acres. That means only 300 people and not 500 will be able to gain their living by agriculture?—I do not think legislation of that sort should be introduced at all.

47,669. When you said legislation was necessary you had something else in mind?—I want such a change in the existing law as will empower us to consolidate when a certain percentage of the people affected want us to. I do not want legislation to bind people for the future; I do not think that should be attempted, nor would it be successful. We could not prevent partition in practice, and what matters is what is done on the ground.

47,670. Would permissive legislation be any good?—Operating in what way?

47,671. To check fragmentation?—I doubt whether you could do it, at any rate with a Mohommedan population.

47,672. What is your opinion of the *batai* system in this Province? Has it had a bad effect on the indebtedness of the tenant, and would cash rent be an improvement on it?—If you start out to argue that a certain rent has a depressing effect on the tenant, you assume it is too heavy. Actually there is a shortage of tenants in this district and not a surplus, so the rent cannot be too heavy; if an owner demanded too much the tenants would move to the next village.

47,673. I am trying to find out how you diagnose the disease. Is the trouble due to *batai*, and is a remedy to be sought in a change of that system?—There is nothing wrong with the *batai* system when it is sympathetically worked between landlord and tenant. When you hear of the high share taken by the landlord you must remember he pays something out of that share; if he takes a half on land irrigated from Government canals, for instance, he pays the land revenue and the water rate.

47,674. With regard to the Land Alienation Act, you told us that at present it is very difficult for a seller to find a buyer?—It is difficult.

47,675. And that that was due to the Land Alienation Act?—Yes.

47,676. If that is the opinion of the Settlement Officer I wonder why the Act was recently introduced here?—It is true that the number of persons in the Peshawar district with money enough to invest in land is very small. At present the number of people who want to sell land is very much greater than the number of people who can buy it.

47,677. *Sir Henry Lawrence*: Has olive cultivation been successful in any part of this Province, do you know?—It has never been attempted, but the wild olive exists in the hills.

47,678. No attempt has been made to cultivate the olive?—It is being investigated at Tarnab, but there has been no cultivation on any extensive scale.

47,679. *Sir Ganga Ram*: You said the water given to the zamindars was sufficient. Can you explain the word "sufficient" in figures? How much is the gross area and how much water do they get? Would you like me to reserve that question?—You might ask the Secretary for Irrigation, who is appearing before you. I could get you the figures if you wish.

47,680. Do you not think this water-logging is due to excessive watering?—Not altogether. It must be due in part to seepage from the canals; I think that is the principal cause.

47,681. Do the canals run in high embankments?—Yes, and they cross drainages. All the Government canals in this district do that.

47,682. But do they not run on watersheds?—No. In a way this district is favourably situated, because there are many natural drainages, which carry away a lot of the seepage water.

47,683. With regard to this settlement work, what share of the gross produce do you take?—I think it is usually less than 5 per cent.

47,684. In the United Provinces they said they charged only 2 per cent.?—I can give you the exact figures if you like.*

47,685. Kindly let us have a note on that. Many of these Pathans come to the Chenab Colony?—From the dry parts of the district, yes. They are mostly contractors.

47,686. Very many of them come. They build walls?—They may be from Kabul. The Pathan in this district does not build his own village.

47,687. Has the building of the railway up the Khyber given them more money?—The whole of the money spent on that went into the pockets of the Afridis; it did not help this district.

47,688. Has the standard of living of the Pathans risen?—Immensely.

47,689. In what way?—They live very well now. Their houses are well built. They live very comfortably.

47,690. You have several minor streams in this district. Has everyone the right to put in a pump and pump up water from them without regard to the rights of the people at the tail end? What is the custom or law about it?—There is no custom in the whole district governing the question of pumping water, and I do not know of any law about it. The Punjab Minor Canals Act does not affect that.

47,691. If it is not confidential, can you tell us how much increase you are going to make in the two tahsils you have completed, as compared with the last settlement?—It is published, so I can tell you: 25 per cent.

47,692. *Mr. Calvert*: After 30 years?—Yes. The orders at present are not less than 20 years. The final orders as to the period of this settlement will be passed when the settlement report is written.

47,693. What was the estimated rise in prices in those 30 years?—30 per cent.

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* Not received.

47,694. **You are taking less now than was taken 30 years ago?—Yes, proportionately.**

47,695. *Sir Thomas Middleton*: What proportion of the cultivated land of the Province is measured and mapped in the village papers?—In the settled districts the whole of it was done more than 20 years ago.

47,696. In revising the settlement, do you find considerable errors in the areas shown in the village papers?—In this district (I speak of the area I know) the survey was conducted on a common base-line for the whole district, on a square system, and it was wrong. The existing maps are inaccurate here.

47,697. The triangulation was wrong?—It was on the square system. At this settlement we have done it by the Survey of India.

47,698. You have no survey branch, so your officers simply fill in the triangles that are given you from the Survey of India?—Yes.

47,699. You mentioned the peculiar way in which the Pathans originally allotted land in *vunds*?—Yes. The *vund* was a sub-division of the village land, and in each such sub-division everyone received a tiny strip of land. The idea apparently was that if there was a feud with a neighbouring village they would all be together at reaping and sowing time and ready to take up arms if necessary.

47,700. It has been pointed out that the price of land has risen to a very much larger extent than the price of agricultural produce. To some extent, no doubt, that is due to the greater security now prevailing in this Province, but what, in your view, is the main cause of the great rise in the price of land?—I think it is probably due to the accumulation of capital which did not exist before.

47,701. It is not due to land hunger? Is it not due to the fact that a point has now been reached when the demand for land is increasing very rapidly while the available supply of land is narrowly limited, and so a very steep rise in the curve of values results?—I do not think it has anything to do with that. Very often alienations in this country mean only that somebody is consolidating his holding. The unit for alienation here is the field, not the holding. There is, for that reason, always a demand for land from the small owner to round off his holding.

47,702. And that accounts for the very high prices paid?—It contributes to that.

47,703. *Sir Henry Lawrence*: You mention an accumulation of capital. I understood everyone was steeped in debt?—The capital is very largely in the hands of the non-agricultural classes and the bigger owners.

47,704. Are the non-agricultural classes here allowed to purchase land?—They were until 1922, but now they no longer have that facility.

47,705. *Sir Thomas Middleton*: Has there been an immediate effect on prices?—To some extent.

47,706. *Sir Henry Lawrence*: Is the custom of tenants leaving one zamindar and going to another very common?—I think not, except where the land is bad. Sometimes they move a lot.

47,707. Do tenants stay a long time with a zamindar as a rule?—Yes.

47,708. Have they the right to stay? Have they long leases?—You very seldom find cash rents paid by small cultivating tenants; there is always a middleman. Cash rents paid direct to the owner are very rare.

47,709. But has a man cultivating land the right to stay on that land for any length of time?—If he has no lease he can be evicted at any time.

47,710. Does he generally hold a lease?—No, there is generally a middleman who holds the lease and who cultivates the area through tenants paying rent in kind.

47,711. He has an interest in improving the land?—Yes, if the term of the lease is reasonably long.

47,712. Is it often reasonable?—Yes.

47,713. What do you mean by " reasonable " ?—10-year leases are common.

(The witness withdrew.)

The Commission then adjourned till Saturday, March 19th, 1927, at 9.15 a.m.

APPENDIX.

Note by Mr. Wylie.

There appears to have been some misunderstanding in my mind over Mr. Kamat's questions.

I have made innumerable calculations of this but these do not find a place in my Assessment Reports, as these have to be submitted in prescribed form and must adhere to the sanctioned theory of assessment. The following very simple examples are reproduced: —

A) On land irrigated from Government canals, the whole area being of exactly the same quality, the following rents are found side by side:

(i) *Rs.22 per acre, the lessee paying the land revenue and the water rates.

(ii) One-fourth of the produce, the tenant paying the land revenue and the water rates.

A fair assumption, obviously, is that Rs.22 equals one-fourth share of the produce. Therefore, the gross produce of one acre will be Rs.88 and the gross produce of a holding of five acres will be Rs.440.

It may be remembered also that this rendered average cash rent is paid by middlemen lessees who make a profit, and, judging by appearances, a handsome profit, out of the differences between the cash rate they pay to the owners and the kind rent they recover from the tenants. The value of the gross produce of five acres may therefore be estimated at as much as Rs.500.

(B) In lands irrigated by private canals the following rents are found side by side on lands apparently identical in value, both in quality and situation: —

(i) Rs.38 per acre.†

(ii) Half the produce.

The gross produce of an acre may therefore be valued at Rs.76. But, when the owner receives one-half he pays a contribution to the cost of cultivation in the shape of menials' dues, &c. In the particular circle for which the figures are taken cane is the great staple, and in the case of this crop menials' dues are very heavy. Here again the gross value of the produce of one acre is not less than Rs.100.

I have made similar calculations for holdings of various sizes using,

(*a*) assumed yields,

(*b*) present-day prices,

(*c*) customary relations,

and the result comes to very much the same figure.

My conclusion is that on the best irrigated land in the Peshawar District the value of the gross produce, at present-day prices, is not less than Rs.100 per acre.

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* This is the average cash rent on an area of 16,000 acres in one circle in the Charsadda Tehsil.

† An average rent paid over 2,600 acres in one circle in the Charsadda Tehsil.

Saturday, March 19th, 1927.

PESHAWAR.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries.*)

Mr. S. WALKER, Secretary for Irrigation, North-West Frontier.

Replies to the Questionnaire.

QUESTION 8.—IRRIGATION.—(*a*) There are two irrigation organizations in the North West Frontier Province:—

(i) Government canals administered and run by Irrigation Engineers lent to the Province from the Punjab Irrigation cadre, and qualified men temporarily appointed in the North West Frontier Province.

(ii) Canals constructed by the people themselves with or without the help of Government, and the Paharpur Canal in Dera Ismail Khan District, constructed by Punjab Irrigation Engineers.

These canals are run by the Deputy Commissioners of the district.

Government Canals.—(*a*) All extensions and improvements on the canals under (i) have been or are about to be carried out.

The chief need on these canals is a complete drainage scheme, including the maintenance in good condition of all natural drainages.

Such a drainage scheme has been inaugurated; a continuous policy in this respect is essential for the welfare of the Government canals area.

The Government canals are:—

(i) The Lower Swat Canal offtaking at Abazai on the Swat River, built towards the end of last century. This canal is fully developed.

(ii) The Kabul River Canal offtaking from the Kabul River at Warsak, also built towards the end of last century. This canal is fully developed.

(iii) The Upper Swat Canal offtaking at Amandara, Swat Valley, and discharging through a tunnel 11,200 feet long into the plains, close to Durgai, at the foot of the Malakand Pass.

This canal was constructed between 1908 and 1914 (formal opening) and is, so far, only slightly over half developed.

All the above canals are perennial and on their areas there is no scope for any other kind of irrigation extension.

For the purposes of fully developing the Upper Swat Canal the chief needs are:—

Tenant farmers, and the waking of the large land-owners from apathy towards their estates.

Various expedients have been suggested, some are in force and others about to be brought into force, a few are mentioned below:—

(i) *Taccavi* loans.
(ii) Reductions of rates on undeveloped areas.
(iii) Free crops, for a period, on unbroken and so far unirrigated areas.
(iv) Encouragement in the building of hamlets.
(v) Improvement in road communications.
(vi) Persuasion of the landlords to grant longer and more favourable leases to tenants.

Taking the canals district by district.

Peshawar.—Realigning, proper outletting and regulation, and prevention of waste of water are the chief needs in this district.

Hazara and Kohat Districts.—There is at present little irrigation in these districts, nor have possibilities been investigated by me.

Bannu District.—The chief canals in this district have been run for some 15 years by a competent Indian Engineer with subordinates trained in engineering. With the money and opportunities available, he has done very well indeed for the district irrigation.

A scheme was prepared by Punjab Irrigation Engineers for improving and extending irrigation in the district, but was shelved on account of difficulties as regards water rights. This scheme should be taken up again, *i.e.*, improvement and extension of irrigation in Bannu District, and should include a thorough investigation of the upper reaches of the Kurram and Tochi rivers as to possibilities of reducing the violence and volume of floods and increasing the cold weather flow in the rivers by means of "check dams" and "delay reservoirs." A sufficient engineering staff with irrigation experience would probably find other schemes worth investigation.

Dera Ismail Khan District.—I have just completed a tour through this district and the Waziristan Agency. The canals in the district are in a parlous condition. There is no engineering staff in charge, villages are being forsaken and large areas are going out of cultivation. The chief trouble is that many torrents come down from the surrounding hills in violent spate during the monsoon months, wipe out bunds, breach canals and ravine valuable land, owing to their having no continuous channels to carry their waters direct to the Indus River.

An engineering staff could apply palliatives while investigating for and constructing the necessary "check dams" and "delay reservoirs" on the main and branch torrents, the only radical cure for the present lamentable condition of the district irrigation.

"Check dams" and "delay reservoirs" are, I am informed, a common feature on torrential rivers in America, Switzerland, Austria and Japan as a means of preserving forests by prevention of erosion of the torrent beds and sides by delay in the flow of storm-water.

The staff would also find useful employment in getting the Paharpur Canal into a better state.

An investigation as to the possibility of constructing a canal from Kalabagh on the Indus, right side, to carry water to Dera Ismail Khan and beyond is now in progress on the ground that this canal, if found feasible otherwise, would depend on the construction of the weir at Kalabagh for the proposed Sind Sagar or Thal Canal, Punjab, on the left bank of the Indus.

(*b*) *Existing methods of distributing canal water.*—I am satisfied with the present methods of distributing canal water to the cultivators.

The only methods employed to prevent waste of water by evaporation or by absorption in the soil are careful regulation and the reduction or closure of the canals when water is not required.

The most equitable and economical form of outlet for distribution to cultivators at the tail end, in my opinion, is the ordinary slit outlet in masonry with a common sill level, width fixed by calculation based on the discharge required by each tail water-course.

Given the present mentality of the cultivators in the North West Frontier Province, I have no improvements to suggest as regards waste of water, or outlets.

Civil or district canals.—(*a*) These canals have for the most part been constructed without competent or any technical supervision, they are badly aligned, scantily provided with drainage crossings, ill-regulated, and altogether badly equipped.

With the exception of some of the canals in the Bannu District, they have no engineering supervision over them.

An Irrigation Engineering Staff in charge of these canals would improve them out of all recognition, and increase the areas irrigated under them, instance the taking over of the Kabul River Canal by the Irrigation Branch in 1903-04 and the adding of about 45 per cent. to the irrigation under it in seven years.

Oral Evidence.

47,714. *The Chairman*: Mr. Walker, you are Secretary for Irrigation?—Yes.

47,715. You have provided us with a note of the evidence you wish to give. Is there anything you wish to say in addition to that?—No.

47,716. You have, I think, been lent by the Punjab Public Works Department to this Province?—Yes.

47,717. For how long? Is it a definite appointment?—No, it may terminate at any time. The Punjab lends men to this Province and can take them back at any time if they want them for any special work.

47,718. How long have you been in this Province?—I came two years ago, but previous to that I was here for 12 years.

47,719. Working on irrigation?—Yes, entirely.

47,720. You will have seen the note on irrigation in the memorandum* supplied by the Government of this Province to the Commission. I take it the figures shown in that note are, in your view, correct?—Yes.

47,721. What is your staff?—I have three Executive Engineers, all of whom are Europeans, and seven Sub-divisional Officers, six of whom are Indians and one of whom is a European. Under each of those officers there are four or five subordinates (Overseers or Sub-overseers) and there is a revenue staff of from two to four ziladars per Revenue sub-division, with a Deputy Collector to each division and a number of patwaris.

47,722. Is that staff sufficient to deal with the work?—Yes, with the work on the Government canals.

47,723. The existing work?—With the existing work on Government canals. That does not include work on the district canals, which are run by Deputy Commissioners.

47,724. Are those canals which have been constructed privately?—The Upper Swat and Lower Swat canals were constructed by Punjab irrigation engineers. Apart from those, there are many civil or district canals which have been constructed either by the people themselves or by the people with the assistance of Government. Generally speaking, they have not been designed or aligned by engineers.

47,725. *Sir Henry Lawrence*: Are you not concerned with their administration?—No, I simply give technical advice.

* Not reprinted.

47,726. *Sir Ganga Ram*: Is it your duty to give technical advice?—I have been asked to do it by the Chief Commissioner; otherwise I am not responsible.

47,727. *The Chairman*: Has your department taken over a certain number of canals which were constructed by private persons in the first instance?—No.

47,728. We have been told by one witness that there has been a considerable contraction in the cultivated area commanded by canals in the Charsadda and Mardan canal region. Do you agree with that statement?—There has been contraction.

47,729. Is it considerable?—Fairly so. We are dealing with that question.

47,730. Does the problem of waterlogging present any peculiar difficulties or complications in this Province?—Yes. It is an extraordinary thing that in a country with such splendid natural drainage there should be any waterlogging at all. It has been caused by the past history of irrigation. In the past the cultivators tried to get every acre of land they possibly could under cultivation, and they tried to use every drop of water in the drainage for grain-grinding mills. The result is that in many cases they have wiped out the natural drainage channels. They have ploughed across them and bunded the water-courses for grain-grinding mills, with the result that when a torrent comes down in spate the water spills all over the country. The raising of the spring-level on account of that flooding is aggravated by our irrigation.

47,731. How long is the season of heavy rainfall?—Roughly two months. It generally begins about the middle of July and may go on till the end of September, but generally it stops about the 10th. Last year the rainfall was 200 per cent. in excess of the normal in August alone. That, of course, caused tremendous damage.

47,732. In spite of the natural fall you have important areas where the sub-soil water is approaching the surface?—Yes, within 4 feet. Drainage would be a comparatively easy matter.

47,733. Are you undertaking that at all?—Yes. I have sent up a scheme to the Government of India for a four years' programme, and Mr. Harris the Consulting Engineer to the Government of India, told me the other day that the Government had sanctioned that scheme, so that we will be able to start after March 31st.

47,734. *Sir Henry Lawrence*: At what cost?—About a lakh a year and a total cost of about 4 lakhs.

47,735. *The Chairman*: Have you any opportunities here for lift irrigation, either by hydro-electric power or other sources of energy?—Yes. We could irrigate a certain area by lift at the tail of the Upper Swat Canal. There is a considerable area between the two tail branches where there is good soil.

47,736. Do you think a scheme of that sort would pay?—It might not pay for a considerable number of years. There is a difficulty about getting tenants; we are short of tenants even for the present area covered by that canal.

47,737. Have you interested yourself in well irrigation where it exists, and the sinking of wells?—I have never had anything to do with wells.

47,738. On page 17 of the Provincial memorandum it says: "The drop in the total area irrigated by wells is said to be due to the greater facilities now being afforded for irrigation from Government canals." I under-

stand, however, the area irrigated from those canals is tending to contract rather than expand?—That is not my note. I have not seen it before.

47,739. Then I draw your attention to that statement and ask you whether you agree with it?—I think it is correct.

47,740. What are the greater facilities now being afforded? The area irrigated by Government canals is contracting rather than expanding?—In the past there were certain restrictions on the taking of canal water by well irrigators; if they took canal water they were charged both the well rate and for the canal water, and I think I am correct in saying they were charged double rates if they took it without the permission of the Deputy Commissioner. Those restrictions have now been removed. The rate for well irrigation is fixed in the settlement; a well-irrigated area, that is to say, has to pay a higher revenue than a *barani* area.

47,741. *Sir Ganga Ram*: Is the canal-irrigated rate of revenue higher or lower than the well-irrigated rate?—I am not sure; I have not examined that.

47,742. *The Chairman*: Does the practice of using canal water for small power schemes (mills and the like) interfere with irrigation?—To a very limited extent. If there is a mill on a distributory it is liable to cause fluctuations in the supply down below; the miller heads up every drop of water he can to get the maximum head on his millstones, and in that way it would affect it to a certain extent. It might mean a man lower down would get a short supply for two or three hours at a time when that was most important.

47,743. But cultivators are allowed to set up such power wheels?—Yes. When there was a full supply in the channel, of course, there would be no shortage below the mill, because the miller would not have to head his water up.

47,744. On page 100 of your note you give a list of various expedients which might have the effect of encouraging occupation, by tenants, of land not now cultivated in the commanded area in the Upper Swat canal, and you suggest reduction of rates on undeveloped areas. Do you refer to water rates?—Yes. That was sanctioned about three days ago by the Government of India.

47,745. It has been suggested in evidence before the Commission that one of the reasons why cultivators do not come forward is that landlords are not offering sufficiently attractive terms. Do you agree with that?—I have no personal knowledge of it, but I have heard that that is the case.

47,746. Is it your opinion that small irrigation schemes such as the bunding of hill torrents and small works of that sort offer opportunities?—Not in my area; that is to say, not in the area of the Government canals.

47,747. Outside that area?—I have not seen any schemes. You mean the introduction of a dam in a river so as to admit of the bunding up of the water for irrigation?

47,748. Yes, with or without expedients for delaying the force of the stream?—I am very strong on that. I think you will find something about check dams in my latest note. It is a thing I would like to say a good deal about.

47,749. Will you develop that a little?—I say in my note that I have just been for a tour through the Dera Ismail Khan district and the Waziristan Agency. There are large areas in Dera Ismail Khan of beautiful soil, where in the past people have settled down and built villages. After a series of years they get tremendous torrents coming down from Waziristan. Those torrents come down only once in 25, 30 or even 50 years, and there are no sufficient channels to take the water away to the

Indus. The result is that they overflow their banks, wipe out the indigenous canals, flood the whole countryside, break up the roads and ruin the people. Going through this district on my tour I saw the state of affairs prevailing. Last year these torrent floods were rather large, and the damage done to the roads and the canals (which are indigenous) was very great. In the case of one particular canal I inspected, whereas in the past the maximum irrigation from it was 14,000 acres, it is now 2,000 only. I think the way to deal with these torrents is by check dams or delay reservoirs.

47,750. Is storage an attraction, or is it merely a matter of delaying the force of the stream?—Storage would be very useful indeed, but I think it is out of the question, because these torrents bring down such enormous detritus (anything up to a couple of tons or more) that it is almost certain that any storage reservoir would fill up in a few years.

47,751. Unless you had arrangements for scouring?—You cannot scour a big reservoir; you can only scour a few hundred feet from the outlet, because you get a big velocity only near the opening.

47,752. Would these schemes for check dams and delay reservoirs be expensive?—I have no idea.

47,753. Have you come across cases in this Province where deforestation has produced erosion and the flooding of streams?—I have not seen anything of that sort with my own eyes in this Province, but in Waziristan I saw evidence that the cutting down of trees has had a very big effect on the torrents adjoining the area from which they were cut down For instance, I inspected two torrents in the neighbourhood of Razmak, one on the left side and one on the right. That on the left was a steep, ragged torrent, and looking up the hillside one noticed there were very few trees. The sides had fallen in and the bed had been knocked about very considerably. The torrent on the right hand side was well wooded on both sides, because it happened to be on the boundary line between two tribes, the Mahsuds and Waziris, who are deadly enemies. Both banks of the torrent were well wooded, probably because these people were afraid to come out on the sky-line to cut the trees. The torrent bed had an easy slope and there was nothing heavy in the way of boulders and shingle in the bed. From that I take it that a considerable amount of precipitation on the hillsides was held up by the trees and the soil, and flowed off gradually.

47,754. Have you heard that the older members of the population in many districts claim that in their time they have noticed a change in the rivers, and that very much more silt is now coming down and the rivers are tending to rise more rapidly and fall more suddenly?—I have not heard that, but I am quite ready to believe it.

47,755. That is a natural consequence of deforestation?—Yes. I had occasion to draw attention to that in Malakand in 1917. I was getting wood down at a very cheap rate, which was pleasing to me as an engineer because I got my work done cheaply; but then I began to think of the consequences of cutting all this wood on the hills, and I wrote a note to my Superintending Engineer and described what I thought the consequences would be. I believe a Forest Officer went up to the Swat country above Malakand and wrote a report which went to the Government of India. I think there is no doubt that the cutting down of trees without reafforestation has had a very considerable effect on the torrents.

47,756. Are you responsible for hydro-electric matters in this Province?—No. As a matter of fact, the only hydro-electric project in the Province is on one of my canals. That was put up for the construction of the Malakand tunnel.

47,757. *Sir Ganga Ram*: Is that working now?—Yes.

What does it do?—We light Malakand and run the fans there and pump water, and I have an electrically-run workshop there.

47,758. How many kilowatts?—About 250. It is quite small. There are three small turbines.

47,759. *The Chairman*: Have you formed any view as to the present state of the canals in private hands?—Yes. You mean the district canals?

47,760. I was thinking of the canals constructed by private persons?—They are practically the same, because nearly all the canals run by the district authorities have been constructed by the people themselves, except the Paharpur canal.

47,761. How about their condition?—They are very bad.

47,762. Would you like to see them all taken over by your department?—It depends on whether we were given the power to put them in proper condition.

47,763. Would that be an expensive matter?—Not comparatively, but the first question the Government of India would ask as regards any expenditure we proposed to make would be whether it would be remunerative, and probably it could not be shown that it would pay directly.

47,764. On page 100 you say: "An investigation into the possibility of constructing a canal from Kalabagh on the Indus, right side, to carry water to Dera Ismail Khan and beyond . . . "?—Yes.

47,765. What stage have those inquiries reached?—I now have surveyors on the ground. I expect them to finish the preliminary survey in about a month.

47,766. Would that be a big scheme?—It would be, if it went through; it might irrigate something like 1½ to 1¾ million acres.

47,767. *Sir Henry Lawrence*: Irrigate or command?—Irrigate, partly in the Dera Ismail Khan district and partly in the Punjab.

47,768. *Mr. Calvert*: What sort of line would it take?—From Kalabagh along the foreshore.

47,769. How would you get through the Khirri Khisor range?—We would bring the canal along the foreshore.

47,770. *The Chairman*: It would be entirely on the right hand side?—Yes, there would be nothing on the left side. The left side is being catered for by the Thal Canal. This new canal would, I hope, command a very much bigger area than the Paharpur Canal. It would come in much higher up on the range. There is a range of hills coming right down along the Indus, and our objective is to get a canal along that range. There would be a tremendous amount of rock cutting and a certain number of tunnels, but everything is possible with money.

47,771. *Sir Henry Lawrence*: What is the estimate of the total cost?—I have not got out an estimate yet; I am only running a trial line. It would cost a tremendous amount of money.

47,772. What sort of a figure have you in mind? Ten or 20 crores?—Fifteen crores.

47,773. Does that include the rock cutting and tunnels?—Yes. There would be a line of about 80 miles along the foreshore.

47,774. Then you would debouch on the plain?—It would probably come into the plains just north of Paharpur. I think it would be too expensive.

47,775. Would it carry on into Sind?—I think not.

47,776. *The Chairman*: Are there any other schemes which you have in mind?—The improvement of the Bannu irrigation.

47,777. No other schemes of canal irrigation?—No.

47,778. What have you in mind for the Bannu district?—There there are canals which are comparatively well run with the money that is given for them, but I believe we could improve and extend the irrigation there very considerably.

47,779. *Professor Gangulee*: By restoring the old canals?—By extending the present canals. There are quite good canals there now, but there is no means of regulating them. The people simply build stone *bunds* in the river, and those stone *bunds* are carried away by every flood.

47,780. *The Chairman*: It is merely a question of administration?—It is a question of execution as well. We would have to put in a weir, and we would have to prolong the canals at both ends, taking them higher up the river to the weir and extending them further.

47,781. Are you in close touch with the Agricultural Officer in matters where problems of irrigation involve agricultural considerations?—Yes. I meet the Agricultural Officer frequently.

47,781. Are you in close touch with the Agricultural Officer? Is he sufficiently sympathetic and active in matters affecting both the agricultural and irrigation improvements?—Certainly.

47,783. Have you in your department a precise estimate of the delta required to grow various crops in this Province?—I think the delta varies enormously with the state of education of the people. We know what, or about what, the delta ought to be for different crops, but we cannot say what it is going to be in a particular tract of country. For instance, on the Upper Swat canal, which is only half developed, the delta is very high; it is disgracefully high, but you cannot run a canal which is only half developed with a small supply, because you do not get the command. You have a number of distributaries taken from a branch canal which are designed for a certain height of water above the distributary gates. If you put only half the supply into the branch you will not get it into the distributaries without stop dams or regulators on the parent channel, which would be unnecessary when the canal develops fully. On a half-developed canal, therefore, you have to run much more water than is required for the crops, and that means you have to escape a lot of water.

47,784. How about the amount of water actually required on the land to grow certain crops? Do you feel that you have sufficiently accurate information on that point?—Yes.

47,785. What do you give for sugarcane?—About 5 feet at the distributary head. For wheat 1·6 to 2 feet should be sufficient. We give a tremendous amount of water for sugarcane.

47,786. *Sir Ganga Ram*: And for paddy?—Almost anything you like!

47,787. Is there no paddy cultivation here?—In Swat, off the river. We have practically none on our canals.

47,788. What duty does the paddy require?—A duty of 50 acres to a cusec, probably.

47,789. *The Chairman*: Is it your view that there are technical problems in connection with waterlogging, saline efflorescence and things of that nature that require further investigation?—I should think so. That is more the business of the agricultural chemist, I take it.

47,790. You do not think the Irrigation Department might be responsible for rather more original research than they are undertaking at the moment? —If we had the co-operation of agricultural chemists I think we might do a good deal as regards soils, but I do not see what engineers alone can do. They could carry out the actual work if advised by an agricultural chemist, but we have not got sufficient chemical knowledge to act alone. We do

not know enough, for instance, about the various salts in soil to do that work ourselves.

47,791. *Sir Henry Lawrence*: Can you tell me a little more about this proposed canal? What is the cost of the weir across the Indus at Kalabagh? —I do not know.

47,792. Is the cost of the weir not included in that figure?—Our share would be included in our estimate. I am only making a preliminary investigation as regards this canal; I am running a line for about 80 miles from Kalabagh through the foreshore of the Indus to see whether it is possible to take a canal down there; I have not gone into the cost in any detail, or even generally.

47,793. Is that before you get any command at all?—Yes.

47,794. This weir has already been designed, has it not?—Yes. You will find that in the Thal project.

47,795. You do not remember what its cost was put at?—No. That was a Punjab project.

47,796. But you will eventually be debited with a half share of it?—Not as much as that. It might be as much as one third. The debit would be according to the quantity of water taken off at each side, I take it.

47,797. What sort of canal have you in view? How many cusecs would it carry?—That depends. If we can get a reasonable line along the foreshore we may have a canal of something like 5,000 cusecs; if we do not, we might be able to put in an economical canal of half that. It entirely depends on what sort of line we get along the foreshore.

47,798. At any rate, you would not contemplate a canal of 15,000 cusecs? —No.

47,799. On financial or engineering grounds?—No.

47,800. If you can have a canal of 5,000 cusecs there is no engineering reason why you should not have one of 15,000?—Generally speaking, no. It is quite possible, however, that with the country the canal would have to go through there might not be room for a canal of 15,000 while there might for one of 5,000. The hills come down fairly steeply to the Indus.

47,801. Right down to the Indus?—Yes, and it is probable we will have only one line and no alternative.

47,802. You will have to cross the Kurram river?—Yes.

47,803. How would you do that?—Probably by a syphon.

47,804. Is a syphon possible for a canal of 5,000 cusecs?—Yes.

47,805. Is it possible for one of 15,000?—Yes. It is possible for 30,000; it is only a matter of putting in a certain number of barrels.

47,806. Where you have this hilly country, it is conceivable you might not be able to find room for a 15,000 cusec canal?—Quite so.

47,807. You spoke of taking the foreshore of the Indus. Is no line further back possible?—No, because of the hills and levels.

47,808. *Mr. Calvert*: It is a very sharp slope.

47,809. *Sir Henry Lawrence*: The whole way down to Dera Ghazi Khan you would have to cross numbers of hill torrents?—Yes.

47,810. That will mean a great many aqueducts?—Yes, or syphons; it depends on the levels. You can use syphons, aqueducts or super-passages (*i.e.*, taking the torrent over the canal at a fairly high level). It depends on the relation between the level of the bed of the canal and the level of the bed of the torrent.

47,811. In the country this canal would pass through, is the land chiefly in private occupation already or is it Government waste land?—Practically the whole of it is in private occupation, but I think it would be possible to get the people there to give us one acre out of three, or something of that sort, as a *quid pro quo* for getting water.

47,812. Was some such arrangement made in regard to the Thal project, the surrender by private occupiers of their rights in the event of the canal being made?—I cannot tell you anything about that.

47,813. *Sir Ganga Ram*: There was an Act passed; the people gave a quarter of their area to Government?—I am hazy about the conditions.

47,814. *Sir Henry Lawrence*: When will this canal project be sent up to the Government of India? In another year or two?—The first report that will be sent up is as to whether the line I am now taking will be feasible or not. If it is, and the Government of India agrees to my going on, I would have to do a great deal more surveying, and I would have to prepare plans and estimates. I should think that would take at least two years.

47,815. *Sir Ganga Ram*: On the basis of 5,000 cusecs?—As I say, that depends on the conditions I find on this 80-mile line.

47,816. *Sir Henry Lawrence*: Do you anticipate being able to get 1¾ million acres cultivated with with a discharge of 5,000 cusecs?—I am afrai l I cannot go into figures.

47,817. That is the area you suggested might be covered?—1¾ million acres is the possible area.

47,818. The area commanded would be three or four times as much?—No; that would be about 75 per cent. of the total. I cannot say yet whether such an area would be commanded or not. The supply in the canal depends on the proportion of *kharif* to *rabi*. Roughly speaking, you can do twice as much *rabi* with one cusec of water as you can *kharif*, and by adjusting your areas of *kharif* and *rabi* you get a canal of a certain size. If you take the *kharif* as 1 to *rabi* 2 you have a canal with a constant full supply.

47,819. What is in your mind, is a *rabi* water supply of 5,000 cusecs?—No, I should think the *rabi* supply would be less.

47,820. Much less?—Probably about 3,000. I am now speaking entirely in the air.

47,821. *Sir Ganga Ram*: In the case of this canal, what depth of cutting through the rock do you contemplate?—I think the maximum economic height of cutting is somewhere about 40 feet; after that, it is cheaper to tunnel.

47,822. That would cost an enormous amount of money?—Yes.

47,823. Would not pumping up the water on one side and so down the other be an alternative?—No.

47,824. Have you thought of it?—No. I would not think of it. It would be too colossal.

47,825. To raise 3,000 cusecs 40 feet high would not be such a very colossal undertaking?—The 40 feet is for the rock cutting; there is more on top of that; there is the rest of the hillside.

47,826. What will be the cost of the rock cutting?—Probably Rs.30 to Rs.35 a thousand cubic feet.

47,827. What kind of rock is it?—Moderately hard. There again I am speaking in the air; I have only just seen it.

47,828. What fall have you at Malakand?—We have a tremendous fall of somewhere about 300 feet at the tail of our tunnel.

47,829. How many cusecs?—The maximum discharge of the canal is 1,850, but that is intermittent and it may drop to something like 600 in the winter.

47,830. Is there no idea of utilising that immense power?—There was a great idea of it in the original project.

47,831. What was the idea?—If you get hold of the original project you will find the scheme mentioned in it as a possibility. The idea was to supply power to the different stations as far as Nowshera.

47,832. Electric power?—Yes.

47,833. It was not to be used for pumping canal water?—No.

47,834. Can you say that wherever the canals cross drainage you have made sufficient provision for their flow off?—Yes.

47,835. What is the difficulty? Has the railway done the same?—I cannot tell you anything about that.

47,836. Does the railway go above the canal or below it?—The Upper Swat canal runs at right-angles to the railway between Dargai and Nowshera. It bifurcates at Dargai. One branch runs to the east and the other to the west, and the railway line runs straight between the two.

47,837. So far as the Dera Ismail Khan project is concerned, 5,000 cusecs at the rate of 5 per thousand acres will easily irrigate a million acres?—Yes.

47,838. Are there any smaller schemes feasible there?—If we could control the torrents there would probably be several small schemes.

47,839. Cannot lift irrigation be used for small schemes?—I have not gone into that question at all.

47,840. When you distribute water here, do you take into consideration the nature of the crops or go according to a fixed rule?—There cannot be any fixed rule.

47,841. We have such a rule on the Lower Chenab?—Are you speaking of selling water by volume?

47,842. No, we get 3 cusecs per thousand acres, and they will not give us any more, whatever the crop grown?—I did not know that. I take it that on the average farm you have crops of all kinds.

47,843. You know what kind of crops we have. If a man said he wanted to grow 25 per cent. sugarcane, would you take that into consideration or would you treat everyone alike?—I think the nature of the crop ought to be considered.

47,844. For each outlet you would consider that question?—Now you are getting into difficulties!

47,845. That is what I mean. Would you consider that?—Let me put it in my way. I take it on the ordinary farm you have crops of all descriptions, and the practical way of fixing the discharge for such a farm is an average on the various crops.

47,846. You will put that average on the distributary all the way?—I think that is the practical way of doing it.

47,847. Have you adopted the new system of A.P.M. outlets?—No.

47,848. How do you safeguard the interests of the tail people?—In this Province we are not bothered with shortage of water.

47,849. I know that. In my opinion, that is the cause of your water-logging?—Quite likely, I agree; a contributory cause.

47,850. You attribute it simply to drainage?—Not entirely.

47,851. One witness yesterday told us the water was abundant, and another that it was sufficient. I want to change these words into figures. The zamindar never thinks he has sufficient?—He is like all farmers.

47,852. Exactly, so I want to know what is meant by "sufficient." Say the gross area is 1,000 acres, how many cusecs do you consider sufficient and how many abundant?—At different times of the year the quantity will differ.

47,853. I mean, so much for *kharif* and so much for *rabi*. Do you do rotation in the *rabi* area?—Very little. On the Upper Swat canal we have a certain amount, and I think that is why we have not had more water-logging there.

47,854. When you have difficulty of command on the Upper Swat Canal, cannot you raise the water by electric pumping?—We have no difficulty of command.

47,855. I thought you said in answer to the Chairman that you had?—I said that if you have a canal which is only half developed, unless you run more water than is required for the actual crops you will have difficulty of command. You know our canals very well. If the full supply of a branch canal is 5 feet and the discharge is 1,000 cusecs but the area you have got actually under irrigation is only half the area that could be irrigated by that 1,000 cusecs, then if you reduce the supply to one-half it is quite possible you will not get command into your distributaries. I have had that case on the Upper Swat Canal, where I tried to run a small supply and could not get it into my distributaries; I had to run more than was otherwise necessary.

47,856. What do you do with the surplus water? Is not that a cause of waterlogging?—It is escaped; it may be a cause in part; I do not deny we are partly responsible for the waterlogging.

47,857. You are partly, and the railways also?—I know nothing whatever about the railways.

47,858. Waterlogging is due to the fault of the Canal Department and of the Railway Department?—You cannot get me to admit that; in this Province we have been very careful about the drainage question.

47,859. Are all your canals designed in embankment? Are there a good many of them in embankments?—No; but in balancing depth, where you come to a torrent you very often have a pretty good embankment.

47,860. What fall have you given in the Upper Swat Canal?—One in 5,000.

47,861. Does that not cause erosion of the bed?—No, the soil is stiff.

47,862. You speak of delay reservoirs?—Yes; these are works which have been carried out all over the world since the eighteenth century, in practically every European country I should say. A delay reservoir is one which holds up part of a flood and allows it to discharge gradually.

47,863. Have the Forest Department never considered the idea of afforestation of these barren rocks by terracing them?—Not that I know of, in this part of the country at any rate.

47,864. As an Engineer do you think it is possible?—Yes.

47,865. *Professor Gangulee*: On page 101 of your note you refer to civil and district canals and you say that these canals have, for the most part, been constructed without any technical supervision. Who are responsible for these canals?—The people themselves built those canals.

47,866. Without any technical supervision by your department?—Yes.

47,867. When were those canals built?—Some of them are ancient history: they have been altered and re-aligned.

47,868. These canals can be restored to a certain extent, can they not?—I believe so.

47,869. With regard to these check dams. I understand there are no such dams in this Province?—No.

47,870. Have you ever drawn up any scheme of that sort?—No.

47,871. What are the special difficulties in constructing these check dams?—None, so far as I am aware.

47,872. Could you give us an idea of the area that can be commanded by constructing check dams?—It is not a question of commanding areas; the idea is to defend the country down below.

47,873. Could not the hill torrents be used for irrigation purposes?—Yes, the hill torrent water could be used in this way. If you put in a delay reservoir so as to delay your flood from two to five days, that means you have got the flow off of the torrent lasting for an extra three days down below.

47,874. If I remember aright in some European countries they do utilise hill torrents for irrigation purposes?—They utilise them for all sorts of things.

47,875. To turn to Appendix C of the Preliminary Survey of the Material Available in the North-West Frontier Province,* you say: "Originally the canal areas were well drained by natural drainages. Certain areas are now deteriorating owing to rise in spring level." What are the causes that you consider responsible for the rise in the spring level?—Interruption of *nullahs* or torrents, canal seepage and natural rain water.

47,876A. These three factors can, I take it, be properly tackled so as to improve the conditions?—Yes.

47,877. Further on you refer to the revenue question. Could you give the Commission an idea of the enhancement of general revenues obtained from existing irrigational facilities in the Province?—No.

47,878. You make the suggestion that, "If a proportion of the enhanced general revenues, due to the prosperity of the people brought by the canals, be credited to the canal revenues, the problem, from the Irrigation Engineer's point of view, will be solved." So that if you could impress upon the Government of India that, by providing further irrigational facilities, the revenue would be protected, they might consider the scheme favourably?—That was exactly my meaning, but possibly I did not put it sufficiently clearly. I had no idea that this enhanced revenue should be brought into account; that would not be practicable at all.

47,879. You have no figure, I take it, to show what is the enhanced revenue that could be obtained?—No.

47,880. You say that one of the handicaps is the lack of tenants for the lower areas of the Upper Swat Canal. Why is that so?—Because the tenants are not there.

47,881. The irrigational facilities are there?—Yes; the land is there also, but the tenants are not there.

47,882. Have any attempts been made to attract tenants?—Yes.

47,883. Have you met with any success?—Very little success.

47,884. *Sir Ganga Ram*: From the trans-border?—Partly. From what I have seen in the hills round this country, I am not at all surprised that the people come down raiding and looting.

47,885. *Mr. Calvert*: What is the obstacle to getting the men?—It is difficult to say. I think myself that the landlords do not give them

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Provincial memorandum prepared for the Commission. Not reprinted.

sufficiently good terms or long enough leases. A man is not going to take up land if he is given a lease of only two years; he would want a lease of at least 10 years.

47,886. *Professor Gangulee*: In that connection you suggest that a lead from the large landlords is desirable. Do you think that Government can help in stimulating interest in that direction?—Government could help, I suppose.

47,887. By reducing the rates?—Certainly not by increasing them; it would hardly be practicable by reducing the rates further, which would only mean that the Canal Scheme would have to be put on a very low basis.

47,888. There is no definite scheme before you to attract tenants into this area which is lying idle?—The only scheme I have in view in that connection now is that the landlords should give better terms. I have put up a considerable number of methods for the development of the Upper Swat Canal and the improvement otherwise of its finances, to the local Government, and, where necessary under the rules, to the Government of India. These have been approved of and have been or are now being brought into action. I would now like to see communications improved.

47,889. *Mr. Calvert*: You mention that one of the handicaps under which the Upper Swat Canal is labouring is the large capital cost per acre. Could you give a figure for the area actually irrigated?—It is about Rs.140 per acre actually irrigated and Rs.70 per acre of the area proposed to be irrigated.

47,890. *Sir Ganga Ram*: What *abiana* do you charge?—On an average about Rs.4/8 per acre.

47,891. *Mr. Kamat*: In Appendix C* you have mentioned the Government definition of a productive public work, and you say that the conditions therein are narrow and result in works of a useful kind for the improvement of the country not being investigated beyond a preliminary stage. Further on you say that there are several schemes in the North-West Frontier Province area that would, in all probability, be undertaken if the conditions for a productive irrigation work were improved. Will you just explain your difficulties and suggest what improvements you want?—I refer there to the Kalabagh scheme, a scheme which I have been trying to advocate from time to time. I think if that is possible at all it will probably not be a financial proposition under the present Public Works Department Rules.

47,892. Do you mean to say that in lieu of 5 per cent. Government should expect a return of 4 or 3 per cent.?—Yes, something like that.

47,893. Can you give an opinion as to what it would be?—I cannot; it may be nothing.

47,894. You expect to go on with Frontier schemes even with nothing as a return on capital?—I say that as regards this particular scheme it might be nothing; it is going to be a very costly scheme; on the other hand it would be a tremendously advantageous scheme in giving areas for irrigation on which the tribesmen from Waziristan could possibly settle down; but the area would be so tremendous that you could bring in tenants from anywhere you like.

47,895. At the end of Appendix C* you speak about the export of bone-meal out of India practically without profit to the people, and you suggest that these bones should be utilised in the North-West Frontier Province by turning them into bone manure by means of canal water power. If that is a feasible scheme have you ever tried to give publicity to it?—

* Ibid.

Yes, I have canvassed the scheme among the people of this Province, but none of them seemed to be very keen on taking up the matter. I referred it to Mr. Robertson-Brown, our Agricultural Officer, and he also did not seem to be very much impressed with it. He said that phosphatic manure in itself was not much good, that you required to mix something else with it. For the time being, at any rate, I have dropped the matter.

47,896. Do you mean that the Agricultural Officer was against it on the ground that there was not enough phosphate, or because the scheme would not be a paying proposition?—There was no question of the scheme paying; it was a matter of supplying manure where there was a shortage; and I believe that there is going to be a shortage of manure very soon in the North-West Frontier Province.

47,897. But would bone crushing pay by canal water power?—It may or it may not pay; Mr. Robertson-Brown does not seem to think that it could be used.

47,898. *Sir Ganga Ram*: The Swat Canal is not a paying canal?—The Upper Swat Canal has now been turned into an unproductive work.

47,899. You say Rs.70 an acre was the capital cost. How much do you reckon as the working expenses?—The annual working expenses now come to Rs.6,76,000, which is equivalent to 1·5 per cent. on the capital cost and the establishment charges per acre irrigated at present would be 1·7.

47,900. I do not understand why these Pathans who go as far as the colonies for labour, are not induced to settle down on such areas which are available here?—The reason is simple; the Pathan is a thriftless kind of a fellow; he will work for a fortnight and then go and gamble away his money; but if he goes down to the Punjab some hundreds of miles away from his home he has got to sit tight for the cold season and then he comes back and does nothing during the hot weather.

47,901. You mention some difficulty in crossing hill torrents. That difficulty has been overcome by hydro-electric power, and we have prepared a project for the Jalalpur canal by hydro-electric power. Have you not seen that?—No.

47,902. Have you considered the feasibility of bringing these Waziristan people on to the land?—Too many questions are involved in that, and I am unable to give a reply to that question.

47,903. I only want to know whether there are any lands available within our border?—Yes in Dera Ismail Khan.

47,904. And irrigation is feasible, too?—That depends on the scheme that I am trying to survey.

47,905. *Sir Thomas Middleton*: Did you make any estimate of the cost of crushing bones in connection with the scheme which you have mentioned? —No; I simply made preliminary inquiries, and as nobody seemed to be very struck with it I dropped it.

47,906. The work could be done?—Yes, I think so, although the initial cost might be comparatively high; the running cost would, however, be low.

47,907. *Sir Henry Lawrence*: To revert to this Kalabagh Canal scheme again; how many miles away from the Indus on an average would you be running this canal?—Somewhere about 8 to 10 miles.

47,908. How many feet above the ordinary bed of the Indus would this canal be running?—I do not know.

47,909. Would it be, say, 500 feet?—Certainly not.

47,910. Would it be more than 10 feet?—Yes, it would perhaps be somewhere about 100 feet above the ordinary bed of the Indus.

47,911. *Sir Ganga Ram*: Is there any possibility of hydro-electric power being available here in connection with the Kalabagh scheme?—Not on the Indus river; the slope is too flat. I think it is somewhere about one in 2,500.

47,912. The canal only requires something like one in 10,000?—One in eight to ten thousand.

47,913. That would soon create a fall somewhere a little low down?—It would be a pretty good distance below.

(The witness withdrew.)

KHAN BAHADUR SADULLAH KHAN, Assistant Commissioner and landlord, Peshawar District.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (i) Yes, I have. India being an agricultural country, I think it is the welfare of the agriculturist which should be uppermost in the mind of every politician in India. The welfare of the agriculturist can be divided into many sub-heads, for instance, better housing, medical aid, sanitary surroundings, some system of credit to keep him going if a real failure of crops or other unforeseen calamity occurs, improvement of the breed of the livestock, increasing the productivity of lands, introducing inexpensive machinery to reduce physical labour and give better results, introduction of subsidiary trades in order to assist him in the case of failure of crops and to enable him to dispose of what he produces to his best advantage and introduction of education on agricultural lines mainly directed to produce literacy and to make the peasant know more of applied agriculture in practical forms but at the same time avoiding to burden his brain with technicalities and the necessity of learning a foreign language. I do believe in a research into the scientific value of the indigenous theory and traditional method of agriculture. In a conservative country like India foreign methods can rarely receive a warm welcome, and from a layman's point of view I may say that improvement should be from within and not from without.

(ii) This branch of the research, I must confess, has so far been very poorly attended to. The chief investment of an agriculturist next to land is his live-stock. It tills his lands, runs his Persian wheel, feeds his children and, finally, produces manure for improving the condition of land. I must submit that the research should be directed towards the improving of the breed of the live-stock. This provision should be made in the main centres, *viz.* efficient veterinary staff to effect prevention and cure in the disease of animals and the spreading of general information as regards steps which should ordinarily be taken to prevent the breaking out of a disease and of coping with it if it does break out.

(*b*) Does not arise in this Province.

(*c*) My sub-division fortunately and unfortunately possesses three rivers and two Government canals: waterlogging is a great problem for us and the crude method of water cuts has not yet proved very useful and practicable. It is desirable to investigate as to how this problem could be usefully solved. Fruit farming also requires attention. So far it is not popular amongst the agriculturists, and beyond a few pleasure gardens, on which more is spent than what is received, there is no serious attempt in fruit farming in this district. The gardens round Peshawar city also are not very high specimens of this subject. The fruit that is produced is exactly what it was a hundred years before.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) There is no supply of teachers and such institutions.

(ii) In my opinion teaching facilities are the crying need of this Province generally and Peshawar district particularly. My suggestion is simple and from a practical point of view. Have night schools and slack season training. Begin by introducing literacy in making the agriculturist know how to read and write his own mother-tongue. Then in his own language try to spread information leading to the improvement in his surroundings and in his trade. Have a college in the Province, say at Peshawar, subordinate to Pusa or Dera Dun, and small schools in main centres, to turn out experts and to give higher education to the sons of Khans and landowners who wish to have it on scientific lines. According to the present system the person who only wants to manage his own lands and a person who would plead at the Bar and a person who would be professor in the laboratory has practically the same type of education. I respectfully insist that agriculturists being the mainstay of the country, it is the first right of an agriculturist that primary education enough to make him literate and generally understand his work and secondary and high education to train the high classes on more scientific grounds should thus be provided for the agriculturist's son. The real Swaraj of India is the training of an agriculturist's son for better citizenship.

(iii) Yes, agriculturists should be encouraged to learn on scientific lines and then go back to their villages and teach those who cannot avail themselves of higher education.

(iv) There are no agricultural teaching institutions and therefore this question does not arise.

(v) This question does not arise. But if a school is opened, the incentive can take the shape of recruiting the teachers and professors of agricultural schools and colleges from amongst those who offer themselves for education. Also the selection for Imperial Services and scholarships for agriculture and cognate professions like forestry, &c., &c., from amongst such students. Local scholarship and rewards, met from the provincial budget, would also prove useful in this direction.

(vi) There being no agricultural school and college, this question does not arise. It would be interesting to note that a very large number of pupils reading in the ordinary schools and colleges come from agricultural families. This shows the anxiety of these families for education. In fact, there is a danger also. Education on wrong lines directs the boys' inclination towards other professions to which, in fact, the present scheme of teaching has been mainly directed. A zamindar's son on getting his degree knocks about for service or begins to live in exile in the city in quest of a living at the Bar, rather than to interest himself in his own estate and to work at it to make a living.

(x) We can make agriculture attractive to a middle class youth by making him understand that he can live decently on agriculture also. At present there is a sort of feeling that an agriculturist is inferior to a man living in the city. The youth therefore wishes to forsake the profession of his ancestors and tries to take callings usual in the city. The spread of agricultural education and improving the life of an agriculturist should, in my opinion, incline the youth of the middle class to take to agriculture. When education has lifted him from an ancient groove, things like poultry farming, cattle farming, dairy farming and other akin professions would naturally be the agriculturist's second pursuit.

(xi) No.

(xii) We can popularise adult education by giving scholarships to intelligent people to be availed of at the agricultural schools and colleges and rewards and prizes to those who show keenness in the night schools or slack season schools; as regards the latter, *hujras* in our district are very convenient institutions for housing such schools, as by custom the adult do

collect in there in the evenings and even in the day time when they are off their work.

(xiii) The administration of educational facilities should, in my opinion, be under the control of the Director of Agricultural Education, assisted by the staff of the proposed college and the schools. As regards its finance, provincial grants coupled with district board contributions and, I suppose, Imperial assistance from time to time, should be enough to meet the proposals above. The present village schools would then be merged into the new schools, and I suppose the expenditure on existing schools would also be appropriated towards the carrying out of new schools. It would be possible to transfer the present village schools into the institutions which I have referred to, i.e., night schools, slack season schools for adults and ordinary day schools for village children, with a preponderance of agricultural subjects in the curriculum. Moreover, the resulting increase in production on account of improvement would also lead to the increase of revenue, which would be a return for the initial investment on an agricultural college and schools.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) In my humble opinion, so far no measure has been successful in substantially influencing and improving the practice of cultivation. There is only one experimental farm at Tarnab, which is considered by every one a model farm, no doubt, but its usefulness lies only in scientific direction. I do not think it has given any useful help to the cultivator in improving his every day routine of agriculture. So far as I know, it is not a success from the demonstration point of view. Economically speaking, its expense is more than its return up to this time.

(*b*) The sums spent on the model farm can be more usefully used in having field demonstrations in the villages. This suggestion of mine would go hand in hand with the main scheme I have submitted, with a college at the capital of the Province, schools at the main centres dealing exclusively with agriculture, and village schools mainly teaching on agricultural lines, the staff also helping the adults at the night and the slack season schools. It would not be impracticable to have one or two experts belonging to these institutions in charge of every tahsil, superintending small demonstration farms created for this purpose in say six villages per year by turn and small school farms attached to the village schools, thus showing to the villagers how to improve their craft and lands with reference to special circumstances of the locality. I am not for abolishing the present farm. It can be attached to the college if required, but I must say that from the view of demonstration and propaganda it has no usefulness.

(*c*) It has been answered above.

(*d*) I am not aware of any such instances.

QUESTION 4.—ADMINISTRATION.—(*a*) Does not arise, because no reforms have been given to this Province.

(*b*) I would not insist on an increase in the scientific staff of the Government of India. I would rather submit that local staff and teaching should be increased. It may be that, when my scheme is matured and the Province with its teaching and staff has begun to go deeper into scientific technicalities, the Government of India will require more high experts.

(i) No. As regards veterinary services I have already replied above. There is no agricultural service in this Province.

(ii) Railway and steamer. I do think that we want a railway line to pass through the Charsadda sub-division in order to avoid the heavy expense incurred by the agriculturist in taking his produce to the nearest railway station.

(iii) From an agriculturist's point of view the condition of the existing roads is very bad. In my opinion, many more decent roads are required in

certain parts of our district. The road-making, in my humble opinion, should be a provincial charge and not entirely a district board concern as at present.

(iv) We have no Meteorological Department here.

(v) and (vi) Village post offices need a more brisk service and telegraph offices should be opened in all important villages where *mandis* (markets for agricultural produce) exist. The present postal service is very slack.

QUESTION 5.—FINANCE.—(*a*) At present there is only one method of affording financial assistance to the agriculturist. It is in the form of *taccavi*. The sum allowed is not adequate, the method of getting it is dilatory and recovery strict. An agriculturist without influence can therefore not avail himself of a *taccavi* advance. In fact it requires influence and persuasion to get the money.

I am not for cheap credit which may lead an agriculturist to indebtedness, but at the same time I must say that some system on the lines of a co-operative or zamindara bank is the crying need of this Province. Private borrowing, with its obvious consequences of the borrower overdoing on his side and the moneylender overcharging on the other, is gradually leading to weaken the agriculturist from the financial point of view. It is absolutely necessary, now that the Land Alienation Act has restricted the credit of the agriculturist on the security of his land and thus inclined the moneylender to charge a higher rate of interest on account of lack of security, that some sort of banking should be started in order to afford facile credit to the agriculturist to meet his *bonâ fide* needs and to attract his own capital in the form of investment in that banking concern, the dividend being an extra profit to him in the long run. On these lines I am for the provision of short and long term credit to cultivators to help them in their agricultural operations.

(*b*) Unless and until the banking referred to above is started *taccavi* by itself would not be enough to meet the requirements. But it can be improved by taking it to the door of the agriculturist and not to make him hanker after it.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are as follows:—

(*a*) Failure of crops and the inability of the agriculturist to carry on from one harvest to another.

(*b*) Sudden epidemic of the live-stock.

(*c*) Failure of irrigation in tracts which lie at the tail end of the irrigation channels.

(*d*) Marriages and deaths and the consequent ceremonial expenses.

(*e*) The complicated system of accounts unintelligible to the agriculturist in which he is always done down.

(*f*) Facile credit at high rate of interest which naturally leads to litigation and adds the costs of it to the burden of the agriculturists.

(ii) The source of credit at present is generally the moneylender. There are no zamindara banks at present, the banks which I have suggested above.

(iii) The reasons preventing payment are as follows:—

(*a*) Evils of private borrowing.

(*b*) Accumulation of interest and debt.

(*c*) Non-control over private account, inability of an agriculturist to understand his position with reference to debts and interest, which sometimes run up in geometrical progression, and the absence of rendition of account in certain cases for years and years. Without committing myself to any definite charge I must say that an agriculturist is helpless in the law courts as against the moneylender's account book. I say that both as an agriculturist and as a judicial officer.

(*d*) The delaying by the moneylender for a long time of his demand and then attempting to enforce it at once in a law court when the agriculturist is not prepared to meet the liability in lump sum. This naturally leads to the renewal of bond and a higher rate of interest.

(*e*) General rise in the cost of living and a tendency to live a better and more expensive life.

(*b*) The banking scheme suggested above, the extension of *taccavi* to the poor peasant, the increase of production and wealth by teaching him a better system of agriculture and the introduction of subsidiary trades and professions. I think equalizing of the moneylender and his agriculturist debtor in the matter of understanding the accounts would also prove useful in this direction. This handicap on the agriculturist must be removed. I agree that rural insolvency should be dealt with separately. The term insolvency should not be used because it carries with it a stigma. A special procedure should be evolved whereby an agriculturist, who has through misfortune or miscalculation so run into debt that he cannot by personal efforts extricate himself, should be in a position to hand over his property to some officer with a view to maintenance being fixed for him and the rest of the income of his estate to be utilized towards the gradual repayment of his debts, interest being suspended from the date of such handing over. He may of course continue to work on the estate if the officer has got no special objection to his doing so and subject to the condition that he hands over the proceeds to such officer.

The Usurious Loans Act has been very rarely used, and the scheme of the Act is not practicable. A renewal of bonds is usual to save limitation, and in such cases the re-opening of the account is more or less a fiction, because the moneylender states that he has destroyed it, being unnecessary while the agriculturist has none. The small village moneylender does not keep account books, and generally he depends upon bonds and deeds which the agriculturist readily executes to put off the evil day.

As regards mortgages and question (*c*), the Land Alienation Act applies. Mortgages cannot go beyond twenty years when executed in favour of non-agriculturists.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) I do not think there is an excessive sub-division of holdings in our district. The agnatic theory of keeping out a stranger helps consolidation.

(*b*) The obstacles in the way of consolidation, if any, would be the old old feud and a cousin not pulling on with another cousin jointly, which is proverbial in this Province. This can only be removed by education.

(*c*) I do not consider any legislation necessary as suggested in this question, so far as this Province is concerned.

QUESTION 8.—IRRIGATION.—(*a*) In Peshawar a canal is required to command the tract lying between Warswak to Jamrud and from there onward *via* Kajuri plain to cross the Bara and turn round Pirpiai to fall in the river Kabul. Another starting from Kala Bagh and going *via* Pezu to Tank and Kulachi is suggested.

QUESTION 9.—SOILS.—(*a*) (i) I have already said above that the drainage system requires looking after in order to improve the land, which is liable to water-logging. Special staff and special allotment is necessary for this purpose.

(*b*) In my sub-division, part of the Sholgara lands and part of the lands irrigated by the lower canal have suffered from water-logging.

(*c*) In my sub-division, the water-logging should be removed which has made most of the land quite unfit for cultivation. On the other hand, the areas which have become unfit for cultivation for want of water require new sources of irrigation.

Khan Bahadur Sadullah Khan.

QUESTION 10.—FERTILISERS.—Artificial fertilisers have never been used here. In the Hazara District permission and facility to get fuel from the reserved forest would naturally reduce the use of cowdung as fuel.

QUESTION 13.—CROP PROTECTION.—I do not think the present measures are sufficient for crop protection. (Recently the sugarcane crop of the whole Daudzai tract and partly of Charsadda tract were rendered useless because of water-logging and frost-bite.) The agriculturist was helpless for want of technical knowledge.

QUESTION 14.—IMPLEMENTS.—New implements and machinery should be introduced. By demonstration and propaganda their usefulness should be advocated. The big Khans should co-operate in adopting the new implements to encourage the cultivator to take them up. The iron sugarcane press, which was once unknown, is now to be found in every village, and has ousted its crude wooden predecessor. The zamindar has found out its usefulness and thus the other implements should also be popularised.

QUESTION 15.—VETERINARY.—(*a*) Under the Director of Agriculture.

(*b*) (i) Some of our dispensaries are under the district board and some under provincial control.

(ii) Yes, extension is required. We require many more dispensaries, for a poor zamindar cannot travel a large distance with a sick animal. The dispensaries should be run so that the doctors in charge should know that they are to serve poor agriculturists and not only the influential people.

(iii) Yes.

(*c*) (i) Agriculturists do not make full use of dispensaries. They are few and far away. At present they are meant for expensive horses and pet dogs of rich people and not for animals of husbandry.

(ii) There are no touring dispensaries in this Province. They would be useful if introduced.

(*d*) In my opinion, legislation and compulsion are inopportune in this Province in the matter of checking contagious diseases amongst cattle. But more veterinary dispensaries co-operating with local officers could check such outbreak through the good offices of local Khans and Raises.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) In my sub-division there is rarely a slack season.

(*b*) Poultry farming, dairy farming, cattle farming, setting up of machinery to make sugar in winter and spring and gin cotton in summer and autumn. This very machine could be used for hulling rice, &c.

(*c*) Poverty, lack of knowledge and absence of market.

(*d*), (*e*) and (*f*) Yes.

(*h*) Small village committees to look after the sanitation would be useful in this respect.

QUESTION 18.—AGRICULTURAL LABOUR.—There is no serious shortage of labour, but on the new canal there is a large scope for more labour. Dangerous conditions on the Frontier prohibit importation of labour from down country. Generally the Tribal Territory Mohmands are the pioneers in this respect.

QUESTION 22.—CO-OPERATION.—I have already discussed that a beginning should be made with co-operative societies and zamindara banks by Government. The other societies mentioned in this question are yet out of the question owing to the conditions prevailing here.

QUESTION 23.—GENERAL EDUCATION.—General education has already been discussed above. I am not in favour of compulsory education at present. The small proportion of boys in rural primary schools passing the fourth class is due to the fact that the present system of education is useless

to the agriculturists. Beyond that class the knowledge gained cannot be utilised in the matter of husbandry.

QUESTION 24.—ATTRACTING CAPITAL.—In this Province there is no impetus to take to agriculture for the capitalist class, because they feel insecure outside the urban area. The gradual advance of civilisation will, I hope, remove this obstacle.

QUESTION 28.—WELFARE OF RURAL POPULATION.—I have already fully discussed the various subjects tending towards the welfare of rural population. Spread of education and information regarding hygiene should be spread. Drainage and other sanitary steps should be carefully enforced. In fact, the district board could do for the district through village sanitary committees what the municipal committee does to a city. Hospitals should be increased and water-works should be introduced.

Oral Evidence.

47,914. *The Chairman*: Khan Bahadur Sadullah Khan, you are Assistant Commissioner, Peshawar?—Yes.

47,915. Would you turn to page 114 of your note. In answer to our Question 1 (ii) (*c*), you say that waterlogging is a great problem for you. What district are you thinking of there?—The Peshawar district, and especially of Charsadda and Mardan sub-divisions.

47,916. Is anything being done to ameliorate that position?—Up to this time nothing has been done, but a scheme is under consideration at the moment.

47,917. I am a little surprised to see that in dealing with fruit farming in the same paragraph, you say, " the fruit that is produced is exactly what it was a hundred years before " ?—That is so; round Peshawar city there are old gardens and no improvement has been made so far.

47,918. Is it not the case that the Agricultural Department has succeeded in introducing important improvements in peaches and other fruits?—The Agricultural Department has succeded only on its own farm so far.

47,919. But that is not the evidence before the Commission. We have had a gentleman before us, the proprietor of an orchard, and he has told us that the varieties introduced by the Department have afforded great satisfaction?—Some Khans and Raises have made little gardens of their own with these varieties, but that is not the case generally.

47,920. On page 115 of your note in answer to our Question 2 you say, " The first right of an agriculturist is primary education enough to make him literate and generally understand his work, and secondary and high education to train the high classes on more scientific grounds should thus be provided for the agriculturist's son." Is it in line with your experience that secondary and higher education have had the effect of improving the boys as agriculturists?—This is my suggestion: here in this Province they have not yet introduced any secondary or higher education, and my suggestion is that if a college is started in Peshawar, then village boys might be given some training on agricultural lines and subsequently sent to the college, in which case it would be very beneficial.

47,921. You think that they will go back to their own farms after they have been through the high school?—Yes.

47,922. On page 116, in answer to our Question No. 3 (*a*), you say: " In my humble opinion, so far no measure has been successful in substantially influencing and improving the practice of cultivation," and again, " So far as I know, it is not a success from the demonstration point of view." Do you know the extent to which the Agricultural Department has been successful in introducing the wheat known as Pusa No. 4?—They have

introduced Pusa No. 4 in certain tahsils, but I do not think that the Agricultural Department have ever examined those fields to see what they have produced. Pusa No. 4 was distributed in the district some two years ago, but since then I do not know if they have distributed any more seed.

47,923. You do not expect to see the distribution of a new variety of wheat afresh every year, do you?—We expect it to be distributed every year, so that the zamindar may be inclined towards getting a new variety.

47,924. *Professor Gangulee*: Do you know the area under Pusa No. 4 at present?—I do not know.

47,925. *The Chairman*: In answer to Question 6, on page 117, paragraph (iii) (c), you say: "Without committing myself to any definite charge, I must say that an agriculturist is helpless in the law courts against the moneylender's account book." Have you any suggestions for remedying that position?—I advocate the Rendition of Accounts Act just as they have in the Punjab, so that an agriculturist may know what his position is; at present the moneylender keeps the accounts, and the agriculturist has no documents with him. The Usurious Loans Act which is applicable to this Province is not much good in the case of high rates of interest, unless it is pleaded by the defendant.

47,926. *Mr. Calvert*: Why?—The agriculturist does not know about this Act, and, unless it is pleaded, the court does not exercise it.

47,927. Cannot the courts take action of their own accord?—Not that I am aware of.

47,928. Is that not the whole basis of the Act?—I do not think the court can take any action unless it is pleaded. In fact, the moneylender generally takes out a new bond from the agriculturist, and he then comes to the court and produces the bond on which he gets a decree.

47,929. *The Chairman*: Probably you are aware that in the Punjab great difficulty has been found in drafting a Bill to require moneylenders to keep their accounts in a particular fashion?—If there is a preponderance of the agricultural class, that difficulty can be overcome. The trouble is that the money-lending class have got the upper hand, the influence; if the agricultural class are better educated, then this difficulty would be overcome.

47,930. On page 119, in answer to our Question 14, you say: "The iron sugarcane press, which was once unknown, is now to be found in every village, and has ousted its crude wooden predecessor." How was the iron sugarcane press popularised in these districts?—Everybody now has copied it.

47,931. How did the vendors manage to get these iron presses taken up?—They can find it everywhere in the market.

47,932. Was it sold on the instalment principle, or price down?—Price down.

47,933. Are you sure that there was no system of trial for a certain period and payment thereafter?—It was tried and the people liked it very much.

47,934. But you have no exact knowledge of any particular methods employed by the firms in question in selling these iron presses?—No.

47,935. Do you know whether it was sold by a firm or through the Agricultural Department?—By a firm.

47,936. *Professor Gangulee*: On the first page of your note you suggest that "in a conservative country like India foreign methods can rarely receive a warm welcome." What foreign methods are you referring to

there?—I mean big machines just as are being used in Europe or other countries; we want to improve our own methods of agriculture.

47,937. But there was no attempt made to introduce big machinery into this Province?—I allude to that.

47,938. With regard to the welfare of the agriculturist, could you tell the Commission what interest the landowners of the Province have taken in the welfare of the agriculturist?—I meant to suggest that there should be a banking system for the agriculturists.

47,939. I ask you, what definite steps have the landowners taken in the direction of the welfare of the agriculturists?—The landowners are giving money to their tenants for the purchase of bulls, and they are also advancing money for the purchase of seed; beyond that they can do nothing. They take an interest in that way.

47,940. On page 115, you say "teaching facilities are the crying need of this Province." I think you are referring there to agricultural education?—Yes.

47,941. We have had a note before us by a very responsible officer, in which he says that he has been trying to find a suitable boy to go to Lyallpur at Government expense, but he has not been successful. What do you say to that?—We always apply, but we cannot get permission. Only last year my nephew got permission to go to Lyallpur College, due, of course, to the efforts of Mr. Robertson-Brown; otherwise I am afraid he would not have got it. As I say, it is very difficult to get admission to the Lyallpur College, so that if a College was started here, all the difficulties would at once disappear.

47,942. *Mr. Calvert*: Do you exercise civil judicial powers?—Yes.

47,943. Do you yourself use the Usurious Loans Act?—I have never used it.

47,944. *Mr. Kamat*: Do you think that the Land Alienation Act has raised the rate of interest?—Yes; by the introduction of the Land Alienation Act the security demanded by the moneylender has decreased, and the rate of interest has therefore increased; and, for that reason, my submission is that co-operative credit societies and banks may be started.

47,945. Is this Province too backward to take up the co-operative movement?—It is not too backward; we will do so if only Government will help us.

47,946. If Government help were forthcoming, people would come forward to help the movement?—Yes.

47,947. What is the difficulty? Is Government nervous about it?—When there is a question of money Government thinks a great deal over the problem; the difficulty is simply one of money.

47,948. Why should not the non-officials demand that more money should be spent on the co-operative movement, or that more Inspectors should be appointed?—I think they will demand that; Haripur has taken up the matter, and I think it might be introduced here as well.

47,949. *Sir Thomas Middleton*: You spoke of the sons of zamindars taking degrees at colleges. Do many sons of zamindars in this district go to colleges in other parts of India to take degrees?—Yes; and generally speaking most of the boys that we see here in the schools belong to the zamindar class; some of them go to Aligarh and Lahore, and even to England, for their education.

47,950. *Sir Ganga Ram*: Do they come back to the land?—No; they usually go in for the Bar and other big jobs.

Khan Bahadur Sadullah Khan.

47,951. *Sir Thomas Middleton*: What institutions have you in the Province at the present time for higher education for these young men?—In this Province we have only the Arts degree education.

47,952. Any Science Colleges:—Yes, Science too in the Islamia College, Peshawar.

47,953. Have you a Chiefs' College in the Province?—No.

47,954. You agree that the first object in education should be to increase the amount of literacy in the cultivating population?—Yes; I say that if the zamindar's son is taught in his own language first, then, in the school, if the curriculum is changed to a certain extent it will do a lot of good to the zamindar's son.

47,955. You mentioned the difficulty of getting admission to the Lyallpur College. Is that difficulty one of passing the Entrance examination?—I do not know, but generally there are a lot of restrictions.

47,956. There is always a large number of applicants for admission to Lyallpur, and they must have some sort of an examination, so that it is possible that your boys have not come up to the standard required?—Those who have gone from this Province have entered for the entrance examination and have passed out successfully. They have fixed a certain percentage for this Province, so that only a limited number are allowed to go.

47,957. How many have been allowed for the North-West Frontier Province?—I am not sure, but I think it is something like four; we want more seats.

47,958. You allude also to the importance of demonstration. You think that there is not nearly enough demonstration being done in the Province?—Yes.

47,959. If you had a limited amount of money to spend on agriculture, which do you think would do more good, or rather which would you choose first, founding an Agricultural College or increasing your demonstration work?—I would increase the demonstration in the villages.

47,960. That is the first objective you would go for?—Yes; I would first have small farms in the villages, and later on I would have a college.

47,961. You refer to the importance of the livestock in your area. Speaking generally, how would you compare the quality of the livestock in the North-West Frontier Province with the quality in the adjoining Province of the Punjab?—The livestock in this Province is not as good as it is in the Punjab.

47,962. Is it a question of the want of a good breed, or is it a question of insufficient fodder in this Province?—There is plenty of fodder in my district.

47,963. So that what you require to do is to improve the breed?—Yes.

47,964. Has anything been done in the way of bringing in improved breeds? Have any experiments been made in your district?—Formerly the District Board used to supply bulls, but now they have stopped that.

47,965. For how many years did they supply the bulls?—For a few years only, and they stopped because of the lack of money.

47,966. They did not find that the scheme was successful?—It was successful, but they were unable to push it forward.

(The witness withdrew.)

KHAN SAHIB ABDUL MATIN KHAN of Takhti-Bai Mardan, Peshawar District.

Oral Evidence.

47,967. *The Chairman*: We have no note from you, Khan Sahib Abdul Matin Khan, but we should be glad to learn of any points which you may wish to put before the Commission?—I am a middleman and a foreigner in this district; I am a Mohmand. I have made some profits by taking up leases on the Lower Swat Canal in the first instance, and now in the Upper Swat Canal, and I have bought some land.

47,968. How much land do you own?—Some 300 acres.

47,969. What is your business?—I am a lessee.

47,970. Would you describe how you operate?—All the land which I take on lease is let out on kind rents, and I cultivate myself about 100 acres.

47,971. Irrigated land?—Yes.

47,972. What is your principal crop?—Wheat, barley, sugar cane, and maize.

47,973. Do you follow a definite rotation?—I plant maize after cane, and after maize I plant wheat or *shaftal* (clover).

47,974. What are the terms of leases upon which you let your land to other cultivators?—They are all tenants at will.

47,975. All on kind?—Yes.

47,976. What share do you take?—A half share.

47,977. Do you control their cultivation at all?—I advise them in that respect.

47,978. Are they obliged to take your advice?—They are not compelled to accept my advice.

47,979. What are your means of redress if they do not farm well?—I am able to evict them.

47,980. Do you do so if they decline to take your advice?—Yes.

47,981. Do you provide your tenants with seed?—I advance them money to buy seed if they need it.

47,982. Have you encouraged your tenants to buy improved seed from the Agricultural Department?—They do not buy from the farm direct; the wheat in my neighbourhood is Pusa No. 4, and they buy it in the villages where available.

47,983. Does it become mixed with other sorts of wheat?—No.

47,984. Is there no bearded wheat showing amongst the Pusa No. 4 wheat?—No.

47,985. Are any of your tenants in debt?—Yes.

47,986. From whom do they borrow?—They borrow from me.

47,987. Do you charge them interest?—No.

47,988. Do they borrow from anyone else?—They only borrow from me; the tenants of other lessees and other owners borrow from the shopkeepers, but my tenants borrow from me alone.

47,989. Can you tell the Commission how much the most deeply indebted tenant owes you?—Rs. 1,200.

47,990. Does the extent to which that tenant is indebted to you affect at all the arrangement of rental? Is there any increase in the rental?—When the crop is reaped, I take from the tenant who is indebted to me first of

all my half share, and from the tenant's half share I leave him enough to feed himself, and I recover from him the current debt.

47,991. Are there any other points which you would like to bring to the notice of the Commission?—I wish to make five proposals for the advancement of my Province. The first proposal is the increase of educational facilities, especially the extension of Urdu; the second is co-operative banks; thirdly, I suggest the appointment of a permanent committee to inquire into corruption amongst the subordinate establishments of Government, and in connection with that my fourth proposal is that the pay of the subordinate officials should be increased.

47,992. What particular service are you thinking of in this matter of corruption?—All the departments.

47,993. When a cultivator borrows Rs.100 as a *taccavi* loan how much does he actually get in his hand?—About Rs.70 or Rs. 80 out of Rs.100.

47,994. Do you also complain of corruption amongst the subordinate grades of the Irrigation Department?—They have ruined the country.

47,995. Would you like to see all the irrigation schemes closed down, so as to get rid of them?—No, but if the pay is increased there may be an improvement.

47,996. *Sir Ganga Ram*: Increased by how much?—50 to 100 per cent.

47,997. *The Chairman*: We note the various points you have raised.

47,998. *Sir Ganga Ram*: In what year did you buy this land?—I have bought it little by little, buying some every year.

47,999. How much did you buy after the Alienation Act came into force?—Very little.

48,000. At what rate do you lease land?—The rates vary from Rs. 4 to Rs.14 an acre.

48,001. Do you consider the settlement heavy or light?—The land revenue is not very heavy, but the Government subordinates are so corrupt that I find I cannot pay both.

48,002. *Sir Thomas Middleton*: What led you to leave your old district and come to this new one?—For my own profit.

48,003. In addition to owning 300 acres you lease a further area, do you not?—Yes, I have 3,000 acres on lease.

48,004. How much land has the tenant who owes you Rs.1200 got?—He owns no land.

48,005. He may own no land, but how much does he cultivate?—About 20 acres. He keeps two yoke of oxen. A man who was as heavily indebted as that would have at least 20 acres.

48,006. Do the oxen in all cases belong to the tenants?—Yes.

48,007. What is the value of a yoke of good oxen in your district?—Rs.250 to Rs.300.

48,008. Is the quality of the cattle in your district good?—Fair.

48,009. Is the land you are cultivating heavy or light?—Not very heavy.

48,010. Do you make any stipulation about the tenants using manure?—The tenants use the manure produced in their own houses and by their own cattle.

48,011. Do they burn cowdung in your district at all?—They do, but I do my best to stop them.

48,012. When they grow sugarcane, do you provide oilcake for manure, or is that the business of your tenants?—They use only cattle manure; they do not use oilcake.

48,013. *Sir Ganga Ram*: From what district did you come originally?—I came originally from the independent territory.

48,014. *Sir Thomas Middleton*: Your tenants use only cattle manure?—Yes, and the scrapings from village sites.

48,015. Have you any arrangement with your tenants requiring them to put so much manure on a sugarcane crop? Who decides the amount of manure?—They put all they can get on to a cane crop.

48,016. Do you allow them to grow more cane than you consider they have manure for?—I assist my tenants when they grow cane. Without assistance they would probably not be able to grow it.

48,017. Did you have any trouble with officials in the country from which you came?—There were none.

48,018. *Sir James MacKenna*: Do you know Mr. Robertson-Brown?—Yes.

48,019. Have you had any assistance from him?—Yes.

48,020. Do you grow any fruit?—Yes.

48,021. Has he helped you in that?—Yes.

48,022. What do you think of the help you have had from the Agricultural Department?—It has been very good.

48,023. *Mr. Calvert*: Where do you get your tenants from?—From my own country.

48,024. Could you not get more to come to cultivate this waste land on the canal we have been hearing about?—The subordinates of the Irrigation Department are so corrupt that more Mohmands (I am a Mohmand) will not come down to settle on the canal until some improvement is made.

48,025. You recommend co-operation. Have you seen it in operation anywhere?—I have not seen it, but I have heard of it.

48,026. You have formed your opinion entirely on hearsay?—Yes.

48,027. Have you heard whether the officials of that department are corrupt?—I hope they will not be.

48,028. *Mr. Kamat*: In the case of a dispute between you and your tenants, do you resort to the primitive rough-and-ready method of settling disputes or do you think of the Usurious Loans Act and the civil court?—I do my best to settle disputes privately, because if I went to court I would be ruined.

48,029. Do you use violence occasionally?—No.

48,030. *Sir Ganga Ram*: Have many people from across the Border come to settle down in this district?—Sixty to eighty thousand.

48,031. From across the Border?—Yes, Mohmands, from my own tribe.

48,032. If the salaries of the employees of the Irrigation Department were increased, would they become honest?—I would like to see a sort of peripatetic superintending committee which would go round and inquire into cases of corruption. That, combined with an increase of pay, should stop corruption.

48,033. From what class or community do these corrupt officials on the canals come?—I do not know where they come from, but they are all alike. There are no Mobmands amongst them.

48,034. Are they all Mohammedans from this Province?—They are mostly recruited in this district. They are of mixed communities.

48,035. Some are Hindus and some Mohammadans?—Yes.

48,036. In another Province it is said that a corrupt Hindu is like a hen scratching in a farmyard, and a corrupt Mohammadan is like a raging tiger. Is that your experience?—The Hindu patwari takes more than the Mohammadan patwari.

(The witness withdrew.)

Khan Sahib Abdul Matin Khan.

Mr. KHUSHAL KHAN of Barikab (Mardan).

Replies to the Questionnaire.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Tarnab Agricultural Station has been successful in influencing and improving the practice of the cultivators.

(*b*) There should be a demonstration farm in each tahsil.

(*c*) The success of a demonstration farm in each tahsil would surely induce the cultivators to adopt expert advice.

(*d*) Mere theoretical propaganda will never lead to success. The superior varieties of fruits and wheat grown at Tarnab are admired by the public everywhere, and there is a great demand for them.

QUESTION 4.—ADMINISTRATION.—(*a*) Yes.

(*b*) This can be expressed verbally before the Commission.

(*c*) (i) No.

(ii) No.

(iii) No.

(v) No.

(vi) No.

QUESTION 5.—FINANCE.—(*a*) Finance may be controlled by the Department of Agriculture, also the agricultural co-operative society of each tahsil.

(*b*) Yes, if controlled by the Agricultural Department and agricultural co-operative societies.

QUESTION 6.—AGRICULTURAI INDEBTEDNESS.—(*a*) (i) The cost of the necessities of life is greater than the income of cultivators.

(ii) The chief source is the Bania.

(iii) The money is let at prohibitive rates of compound interest, and the debt is usually realised at the time of harvest on the threshing ground; the produce is generally accepted by the Bania at the cheapest rate.

(*b*) It is for Government to encourage co-operative societies, and societies must be controlled by the Director of Agriculture and the Board of Agriculture of each tahsil. The Usurious Loans Act should be enforced.

(*c*) Yes.

QUESTION 9.—SOILS.—Yes, by proper drainage and deep ploughing with power-machines.

(*b*) Yes. In Mardan tahsil, vast areas have been turned into salt land by practising irrigation without drainage.

(*c*) It is for Government to improve the vast salt uncultivable areas by proper drainage and ploughing with powerful agricultural machinery. The great areas which are at present covered with thorny shrubs can be brought under cultivation by machinery alone. The cost of the improvements may be recovered by small instalments from owners, when the crops begin to grow on the improved land.

QUESTION 10.—FERTILIZERS.—(*f*) In order to save the cowdung which is at present used, chiefly on account of lack of fuel, forest trees may be planted in areas where crops cannot be grown. The trees, seeds or plants may be provided by Government at reasonably small rates.

QUESTION 12.—CULTIVATION.—(1) Yes, the demonstration farms should convert cultivators to the use of up-to-date implements.

QUESTION 14.—IMPLEMENTS.—(*a*) The modern farming implements, like American ploughs, disc-harrows, cultivators, drills, broadcast seeders, etc., which are everywhere in use in the United States of America, should be

supplied to the demonstration farms by Government for propaganda purposes, and in every Province Government should organise factories and workshops in order to supply the above-mentioned implements to the cultivators at cost price.

QUESTION 15.—VETERINARY. (*a*) The Veterinary operations should be controlled by the Agricultural Department.

(*b*) Yes. They are under the control of the Local District Board, and this plan does not work well.

(iii) Yes.

(*c*) (i) No. There should be a touring veterinary assistant who should tour under the direction of the Agricultural Department.

(ii) No, because the veterinary assistants are not now able to perform the work as well as they should.

(*d*) Legislation is the only aid to overcoming the difficulties.

(*e*) No fee is charged and the owners of the animals have realised the benefits of inoculation, and they are willing to inoculate their animals.

(*g*) Yes. Research as regards the diseases of animals is necessary. This depends upon the Government, whether Muktesar will be enough for the research.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) Yes.

(ii) Yes.

(iii) Yes.

(*c*) Fodder is generally short in the month of January and up to the end of February.

(*d*) Lucerne and berseem, if sown on irrigated and rich soil, will help to a great extent as a green fodder from the month of January to the end of February. A successful growth of lucerne and berseem will induce the landholders to take keen interest; for example, the sowing of berseem has been readily taken up by the cultivators

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*d*) Yes.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) The labourers may be attracted to other parts of the country when they definitely find that the rates of wages are comparatively higher than at their old homes.

(*b*) In many parts of the Provinces, due to the lack of population, there is a shortage of labour, but this can be overcome if the landholders will adopt the use of agricultural machinery.

QUESTION 19.—FORESTS.—(*b*) Yes.

QUESTION 20.—MARKETING.—(*a*) No. There are no metalled roads and the cost of conveyance to the market is very great, and the trade in the market of Mardan is in the hands of Banias, who are generally deceiving the poor zamindars who sell their produce. When the Banias see the produce in the market they join together in lowering the rates of the produce in the market. The zamindar cannot afford to keep it longer in the market, so he is obliged to sell at the rates fixed by the Banias. The market at each place should be supervised by the Board of Agriculture of that locality, and by the Department of Agriculture.

(*d*) Yes.

QUESTION 22.—CO-OPERATION.—(*a*) Co-operative societies should be started by Government influence, and when their benefits are realised by the public and the work of the societies is successful, then the public will willingly take up co-operation.

(*c*) Yes, legislation should be introduced.

QUESTION 23.—GENERAL EDUCATION.—(*b*) (iii) Primary education up to 4th primary does not help the boy to any extent; rather it spoils the boy because he is not willing thereafter to work on the land, and as he is of no use for Government employment, he becomes a peon in an office, etc., etc.

Mr. Khushal Khan.

QUESTION 24.—ATTRACTING CAPITAL. The success of the demonstration farm will surely help to attract the capitalists to invest their money in agriculture.

(*b*) Up to date the landowner has not proved a better farmer than the business man.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Yes, to encourage industries of different branches and to erect factories in different parts of the country as circumstances will allow, and to utilise the raw produce in the factories in India.

(*b*) Yes. Relieve the cultivators of a village from the necessity of borrowing money from the Bania at very high compound interest; the money may be advanced on easy terms to the cultivators; by controlling all their monetary necessities, it is hoped that the condition of the villagers will certainly improve.

Oral Evidence.

48,037. *The Chairman*: Mr. Khushal Khan, you are from Barikab. In what district is that?—Peshawar.

48,038. Are you an agriculturist?—Yes.

48,039. Do you own land?—Yes.

48,040. How much?—I own some hill land and some land in the plains; about 600 or 700 acres in the plains. The hill land is about 1,300 acres.

48,041. Is the land in the plains irrigated?—Most of it.

48,042. Do you cultivate any of that yourself, or is it all let to tenants?—I cultivate some myself.

48,043. How many acres do you cultivate yourself?—About 50.

48,044. By hired labour?—Yes.

48,045. You have given us a note of your evidence, which we have had an opportunity of reading. Is there anything you would like to add to that?—I stress the importance of labour-aiding machinery, farm implements and irrigation.

48,046. In your view the Tarnab farm has been successful in influencing and improving the practice of the cultivators?—To some extent.

48,047. You want more demonstration farms in other districts?—Yes, in every tahsil.

48,048. Which form of demonstration do you think would be more effective: demonstration farms such as that at Tarnab or demonstrations arranged on cultivators' own holdings?—The latter.

48,049. Demonstrations on the ordinary cultivator's holding?—Yes.

48,050. Is any of your land showing signs of waterlogging?—There is none in that part of the country, because there is abundant natural drainage there.

48,051. Are you satisfied with the services of the Irrigation Department?—Not very well. The patwari measures the land every year and charges according to the different crops, and sometimes when there is a dry summer you cannot get enough water for all the land you want to irrigate, yet the water rate is charged on the whole. For instance, there may be water enough to irrigate 30 acres; the farmers try to irrigate 80, and the department charges for 80.

48,052. But you do not pay the full water rate on a crop that does not mature?—That depends on the mercy of the patwari, and if you do not grease the wheel he will say the crop is very good. There should be a meter

on every outlet so that the water could be charged for according to the quantity used. That is done everywhere in California.

48,053. Are you familiar with conditions in the United States, in California?—Yes. I farmed there for many years.

48,054. What class of farming were you engaged on there?—Fruit orchards and rice growing.

48,055. You grow rice in America?—Yes. In California we had better crops than in Louisiana and elsewhere in the Union. I myself have had 54 cwts. from one acre.

48,056. How do you account for that very heavy yield?—We get a very high yield in the United States.

48,057. What other classes of farming were you engaged in there?—Potatoes, celery, rice and fruit-growing.

48,058. Did you ever hear complaints about the corruption of the subordinate members of the Irrigation Department in California?—No.

48,059. Do you think they were corrupt?—No.

48,060. Were there many complaints against cultivators for tampering with the water-measuring machinery?—I never heard of anything like that when I was there.

48,061. What experience had you of the Agricultural Departments of the United States when you were in California?—They were helping as much as they could. The people there are very advanced and do not need much help.

48,062. Did you form the impression that the State Agricultural Department was very efficient?—Yes.

48,063. Did you come across the work of the Federal Department at all?—No, but I saw the experts making experiments on the farms everywhere and making fresh discoveries.

48,064. Did you return to India by way of Japan?—Yes.

48,065. Did you see anything of Japanese agriculture?—Yes. The holdings there are very small, and they generally grow rice and tea.

48,066. How long were you in Japan?—I have been four times, each time for a month or two.

48,067. You have gone into the rural areas?—I travelled from Kobe to Tokyo by train and stopped at many places.

48,068. Did you study the system of education in rural areas in Japan at all?—No.

48,069. Did you form the view that agricultural practice in Japan was highly efficient?—I believe it is, because everything was growing well and the land seemed in good condition.

48,070. Do you know anything about the details of that system?—No.

48,071. Have you farmed in any other part of the world?—No, but I have also been to South America and seen conditions there.

48,072. Which is more profitable? Farming in California or farming on your present land?—In California.

48,073. *Sir Henry Lawrence*: How long were you there?—About 16 years.

48,074. *The Chairman*: Are there any further suggestions you would like to make, other than those you have made in your note?—Yes. I believe the people here cannot improve without the help of Government. They go without many things because they have not seen them and do not even know that they exist. We are short of labour here; we cannot get labour, and what a man can do with his own hands is hardly enough to keep him

and his family. After he has paid his landlord he is half starving, because everything has to be done by him. Here we need two men to cut and thresh 5 acres of wheat. It costs Rs.2.4.0 a month for every maund of wheat sown and threshed. In California it costs 4 cents a bushel to cut and thresh wheat, and they need four men in winter at the time of sowing and six men at harvest time for 1,000 acres. Here we need several villages to deal with a thousand acres, and so everything is very expensive. We have much more land here than there is in many other parts of the country, and it will be centuries before our population is large enough to cultivate it all by the old methods. In India people do not migrate from one village to another very much, and certainly not from one district to another. In California even those people who own 6,000 or 8,000 acres do not have their own machines; there are private companies owning power machinery such as caterpillar tractors and harvesters, and people engage them to do the work at so much per stack. They charge only 10 or 12 cents for cutting and threshing a hundredweight of wheat. If Government were to introduce and operate those machines here and people saw them in operation and saw that for such a small cost they could cut and thresh their wheat and plough their land and sow it, they will take to these things, and private people will get these machines and work for wages for the cultivators Even as it is they have bought motor cars and motor lorries, and use them for transporting passengers and merchandise to and from Kabul and other places; as soon as they saw them they took to them. When they have not seen these things they cannot even imagine they exist.

48,075. You are farming 50 acres yourself. Are you using any improved machinery?—No.

48,076. If example is likely to have such a very profound effect on the minds of the cultivators, how comes it that your wide experience in California has not led you to introduce improved machinery on your own holding?—It cannot be the work of one man; it needs a bigger organisation. It is for Government to take it up in the first place.

48,077. What class of plough are you using, the *desi* or the Rajah?—The Rajah.

48,078. To that extent you have progressed?—Yes.

48,079. Do you use any other improved implements?—Not yet. In California we had mules and horses to work on the small holdings. Here we have oxen, and it takes a very good pair of oxen to pull a Rajah plough.

48,080. Will not the horse maintain its vigour in these parts? Why should you not use horses on your own holding?—We have not got the big horses that are used in Australia and California.

48,081. *Mr. Calvert*: You propose to put co-operative societies under the Director of Agriculture?—Yes.

48,082. Why do you make that suggestion?—Because the population has no knowledge of such things, and if they get *taccavi* loans they will not apply them properly.

48,083. But what have I done that you want to take co-operative societies away from the Registrar and hand them over to the Director of Agriculture?

48,084. *The Chairman*: Perhaps you do not know that Mr. Calvert has been Registrar of Co-operative Societies in the Punjab?—No.

48,085. *Mr. Calvert*: What is your objection to the present system of having a separate Registrar for co-operative societies?—There is none in this Province.

48,086. But your co-operative societies in this Province are being started by the Registrar in the Punjab. Did you not know that?—No. They have not been started yet.

48,087. Have you seen any co-operative societies in India?—No, I have only heard of them.

48,088. *Sir Henry Lawrence*: Has the development of machinery in California been the work of private agencies or of Government?—Of private agencies, but the people are capable of handling it without the aid of Government. Here they require to be trained to do it and converted to the idea.

48,089. How long have these societies for hiring out machinery been working in California?—For the last 25 years.

48,090. They were started privately, without any support from or teaching by Government?—That I do not know, because I was not there at the time, but they get every kind of aid from Government.

48,091. What kind of aid?—They sent a man to India, for instance, to get these small honey bees.

48,092. They brought them from India?—He came here to learn about it.

48,093. But that does not touch the point of machinery?—They are the inventors of the machinery themselves; they are shipping machinery to Australia, New Zealand and so on.

48,094. But was this started in any way by Government?—I was not in California then, but if they needed help Government would give it.

48,095. How long ago did you go to California?—1905.

48,096. *Sir Thomas Middleton*: What was the size of the fields on which these machinery companies to which you refer were operating?—They will work on a field of 10 acres, or even 5 acres. On one occasion I got them in to cut 15 acres of oats for me, and the engineman came with a harvester and cut and baled it.

48,097. But as a rule the fields were very much larger than they are in your district here, for example?—Some; but there are others smaller than those too.

48,098. Do you think that if one of those American companies came to your district and started work, their services would be in demand?—Yes, I think so.

48,099. You yourself would no doubt patronize them but would your neighbours do anything for them?—Yes, if they are satisfied that the work will be done more cheaply by these American companies. For instance, the area of my village is over 2,000 acres and a great deal of that has never been fully cultivated owing to lack of labour.

48,100. Is that state of affairs, namely, land lying uncultivated for lack of labour, common throughout the Province?—Yes.

48,101. You say that you have a great deal of salt land. Is anything being done to try and reclaim or improve it?—Nothing has been done so far.

48,102. Have you met with salt land in California?—No.

48,103. Do you know whether any drainage is contemplated in your district?—No.

48,104. Nothing has been done to improve the salt land?—No.

48,105. I suppose the salt is due to waterlogging?—Yes.

(The witness withdrew.)

Major E. W. C. NOEL, C.I.E., D.S.O., Political Agent, Kurram, North West Frontier Province.

Replies to the Questionnaire.

I find that the Questionnaire does not give me scope to draw the attention I would like to what seems to me one of the most radical means of improving agriculture and rural prosperity in India and I hope that I will therefore be excused if I preface my replies to the Questionnaire by the following general note which, besides making my main contention clear, will throw into a stronger light my replies to the individual questions:

The object of the general note is to plead that the District Officer should be encouraged and assisted by Government to take a direct interest in, and associate himself with, all agricultural matters in his district.

I hope I will be forgiven if, in order to develop my argument, I give expression to the following somewhat trite generalities.

The ultimate problem of administration in any country is to conduce to the contentment of the people towards Government. There are a number of recognised methods which help the attainment of this object, such as the efficiency of the public services, the provision of ready and quick justice, the sympathy and popularity of administrative officials, &c., &c. However, the really radical method which transcends all others is to increase the wealth and prosperity of the people. It is generally admitted that the development and growth in England of the Communist movement depends on whether an industrial revival is capable of absorbing the existing 1½ millions of unemployed. In the same way in India the future contentment of the masses will depend on the possibility of increasing their wealth and prosperity and raising their standard of living. I take it for granted that the solution of this problem is not an industrial one as in England but almost entirely an agricultural one.

If this is so, surely the District Officer should be invited to co-operate and, if necessary, be made to do so.

At present all that Government expects of the average District Officer is that he "should have his district well in hand," that is, that he should know all that is going on and be in a position to ensure that the machinery of administration runs smoothly, and that no abuses can establish themselves.

The officer is the exception and not the rule who goes further, who, for example, by his personality, his natural disposition, in combination with inclination, can win wide popularity and the general confidence of the people. However, apart from the question of disposition, personality and inclination there are several factors which militate against an officer leaving much of a mark. So short is the period of tenure of appointment that higher authority only expects good on the part of the District Officer in the conventional sense of the term.

If, however, the District Officer had to take a direct interest in agricultural matters, merely as an end towards increasing the wealth of the people he was in charge of, he would *ipso facto* and, in spite of the lack of any particular sympathy or personality, be brought more into a better and truer contact with the people and assisted in gaining their confidence. It has been my personal experience that any genuine attempt to do something for the material welfare and prosperity of the people is readily recognized as such and is far more deeply appreciated and placed to the credit of the officer who makes the attempt, than other qualities such as geniality, sympathy and patience.

I have used the words "a better and truer contact" with a special meaning. The administrative officer's contact with the people is necessarily unsatisfactory, in that a great proportion of it is in the precincts of the court, where the parties to a criminal or civil suit do not show up in the best of lights. Even if we assume that the Assistant Commissioner, to whom the above remark particularly applies, has blossomed into a Deputy Commissioner when he has less court work, still take his "*Mulaqatis.*" Nine out of ten of them come to ask for some quite impossible favour or to complain against a rival. How seldom is it that a visitor has come to make a disinterested proposal in the general interest of the district? If, however, as I am suggesting, the District Officer is made responsible for the development and advancement of his district, his contact with the people will immediately become a more human and therefore a truer and better one. Instead of dreading the endless stream of visitors, each with some importunate request that cannot possibly be granted, he will come to look forward to discussing a subject with which they are both in sympathy.

Another line or argument is that, in the length and breadth of India with its 370 million inhabitants, the influence of Government's agricultural stations and experimental farms can only have but a very limited radius of action and therefore require the active assistance of the District Officer to bring the results of their labours to the people themselves. My experience as Assistant Commissioner at Mansehra in the Hazara District and Political Agent in the Kurram Valley showed that in both these areas the work of the Agricultural Station at Tarnab was to all intents and purposes unknown.

At present the existing agricultural and research organisations may be said to be provincial in character. To extend their scope so as to give them a district character would obviously be so costly as to be beyond the bounds of practicability. However, by making use of the District Officer, a reasonably cheap method can be devised of diffusing the work of the Agricultural and Research Departments and giving them a district organisation and complexion.

To turn now to the more practical side of the question, it is clear that to fit the administrative officer to take an interest in agriculture it is necessary that he should be given an agricultural training. Agriculture should be made one of the subjects for the I.C.S. Examination, and a young officer on arrival in India should undergo a practical course of training at an agricultural college and station. In addition to agriculture, I would also recommend a course in engineering, building and construction, for, as will be shown later in this note, the administrative officer can be of the greatest assistance to zamindars in minor irrigation works and the construction of small buildings, etc.

Let us assume then that we have a Deputy Commissioner or Collector with a grounding in agriculture and engineering and a mandate to push the agricultural development of his district in every way he can. It is obvious that he cannot be expected to do so without money. A budget provision will be required to enable him to start a small farm which should in time become self-supporting. The object of this farm should not be to carry out research work but merely to apply the lessons taught in the agricultural station of the Province. For example, the varieties of seeds of the staple crops recommended by the Agricultural Department would be grown, and the seed so obtained would be distributed to villagers. One of the principal aims of the District Officer would be to extend the cultivation of the varieties recommended and his work would be judged by his success in so doing. Conditions vary so greatly over India that it is not practicable to descend into greater detail. It would perhaps help to illustrate my argument if I referred to the work which has been done at Parachinar in the last two and a-half years. The Government of India was pleased to give a special

grant of Rs.2000 a year towards agri-horticultural operations and called for a report after two years as to the progress made. A copy of the report that was submitted is attached to this note. In addition to the activities therein referred to, mention might also be made of (i) pisciculture, (ii) poultry farming, (iii) bee keeping, (iv) minor irrigation.

I will treat each of these subjects separately.

Pisciculture.—20,000 Rainbow ovae were imported last year from Kashmir. About 1,600 yearling have survived and have been put into small streams. 20,000 Brown trout ovæ have recently arrived from Kulu and have hatched out well. A local man has been sent to Kulu for instruction in the care and management of a trout hatchery. The present arrangements cannot be made financially self-supporting by the sale of fishing licences. It will be necessary to put the trout on the market. An attempt will be made to do so this summer. It is still too early to venture any definite opinion on the financial aspect of the business.

In paragraph 17 of the Questionnaire it is asked: "What are the chief obstacles in the way of expansion of such industries as pisciculture." My reply is that the chief obstacle is the absolute apathy and inaction on the part of Government. Personally, I have no previous knowledge or experience of raising trout or the possibilities of marketing the fish. I have had to be guided by reading books on the subject or writing to the Director of Trout Fisheries, Kashmir, and Mr. Donald, the Warden of Fisheries, Dharamsala. Both of these officers have been all out to help, but what one would appreciate would be a visit of a Government expert and his criticisms and advice based on what he saw, as well as any other definite evidence that Government took an interest in the matter.

Poultry Farming. In the Kurram we are too far from a market to make it worth while at present to consider poultry farming as a financial proposition, and the object of the present scheme is to improve the laying and table qualities of the local breed. With this end in view, three pens of pedigree birds were purchased last year and the eggs from these birds are distributed to the villagers at a nominal price, while a certain number are being kept for hatching out in order to keep up the stock. A local man has been sent to Mrs. Fawkes' poultry farm at Lucknow for training.

My observations made in the case of pisciculture, that it is the apathy of Government which is the chief obstacle to development, apply with equal force to poultry farming.

Bee Keeping.—Bees are kept extensively by the local inhabitants, but the honey produced, although of excellent flavour, commands a price of only 8 annas a lb., as compared to the figure of Rs.2 at which honey imported from Europe is sold. This is due to the unattractive form in which it is turned out and the absence of market facilities. There is clearly a market for honey turned out in sections in an attractive manner. I have attempted to keep the local bees in modern hives and have succeeded in producing excellent honey in English sections, but from a financial point of view the experiments have not been successful, as the local bee does not apparently take to the modern bee-hive. I am now trying to import Italian bees.

The chief obstacles in the way of the development of bee keeping are:—

(1) The apathy and inaction of Government.

(2) The absence of any Government bee farm, where a man can be sent for training.

A brochure on bee keeping in India is published by the Pusa Institute, but it is a very disappointing document. Quite fortuitously I heard of a Mr. Bond in Quetta, who has made a study of keeping Indian bees in modern hives adapted for that purpose. His advice I found valuable and it should certainly have been recorded in the official brochure referred to.

An attempt was made at Pusa to keep bees but was given up some years ago. What is required is a bee farm in the Himalayas where :—

(i) Extensive experiments could be made to discover what modifications are necessary in European methods of bee keeping to suit Indian conditions.

(ii) Bee appliances could be sold. To cite an example of the use these could be, let us take the case of "foundation." That required by Indian bees is different from that used in Europe and is unobtainable except at Pusa. However, the article obtained there is of such an inferior quality as to be practically useless.

(iii) Experiments could be made with varieties of bees imported from Europe and any variety found to be suitable could be propagated and distributed.

(iv) Provide a school where modern bee-keeping methods could be taught. Bee keeping is a highly technical subject and it is scarcely practicable to learn it from books.

Minor Irrigation Works.—The zamindar in the Kurram has brought water to nearly all the land which he can. However, with a very small knowledge of engineering and construction work the area now irrigated could be greatly increased. The District Officer could very well supply the knowledge, skill and drive required. Let us take as an example what has happened on many occasions in the Kurram. The zamindars of a certain village petition for assistance in building an aqueduct to carry irrigation water over a ravine. The Political Officer forwards the petition to the Officer Commanding Royal Engineers, with a request that an estimate be prepared. After a delay of probably many months a Military Works Services subordinate goes to the spot and prepares a design and estimate unnecessarily expensive and unsuited to the work in hand. In many cases the work will not be undertaken owing to the high figure of the estimate, whereas a simpler and less expensive design would have done just as well. Assume, however, that the work is taken in hand; it is made over to a contractor at schedule rates which are considerably higher than those which can be obtained with a little ingenuity and management and the work is duly completed. In the course of a year or two a heavy flood comes, scours out one of the piers and the aqueduct collapses. I submit that the District Officer, if possessed of a rudimentary knowledge of engineering and construction, can, in the light of local conditions, make suggestions for a type of aqueduct which a competent engineer can modify where necessary and such an aqueduct can be built far more cheaply and efficiently. I do not suggest that the District Officer should be a "Jack of all trades" and should design and build the aqueduct on his own, but that he should take an intelligent interest in it and should submit his ideas and suggestions to a competent engineer to put into proper shape. We have come back again to the point I have been trying to make all along, namely, that Government should take a keener interest in all matters affecting the material welfare and prosperity of the ryot. Minor irrigation is one of the most important of such matters and I would suggest that Government shows its interest in minor irrigation by making it a special branch of the P.W.D., with a thoroughly competent and experienced engineer in charge of it, whose duty it would be to tour round the various districts and assist with his technical knowledge in carrying out such minor irrigation works as were required. It would be the duty of the District Officer to find out what minor irrigation works were required, to inquire into their respective merits, and, when the engineer came on tour to his district, to put them up to him and to advise him generally on local conditions and the cheapest form of construction and material. The important point is that Government should take an interest in the matter, that the District Officer should feel that

his work and efficiency is to be judged by the progress made in his district, that minor irrigation works were an important factor in such progress, and that it was brought to the notice of Government every year what advance had been made in the matter. The present isolation of the District Officer must be removed and he must be made to feel that in all important matters affecting the welfare of his district, he is linked up closely with an outside organisation which sets a standard for him to attain to and be judged by.

I have purposely descended into details on these three or four subjects, so as to illustrate and bring out my point that, in order to develop agriculture and improve rural conditions, it is necessary to get at the individual cultivator, and that this can be most efficiently and economically done through the District Officer, and by making the district the unit. To enable the District Officer to carry out his new role efficiently, it is necessary to give him the required preliminary training, to put at his disposal the technical advice and assistance he requires, and to keep him up to the mark by showing him that Government takes a keen interest in the progress he is making.

QUESTION 1.—RESEARCH.—(*a*) Something should be done to interest the local administrative officers in the possibilities of research in their districts. To show that a useful field exists for such activities I might take the case of Artemisia in the Kurram. Samples of Artemisia were sent this autumn to the Forest Research Institute and to a private individual interested in the matter. In both cases the analysis results were negative but whereas the Forest Research Institute did not follow the matter up, the private individual took a lively interest in the matter, advised where more likely varieties should be looked for and on this advice, fresh samples were found and on being sent to London showed the presence of Santonin. The individual in question has promised to come to the Kurram and go into the question on the spot.

I would suggest that the Research Department should attempt to interest local officers by suggesting to them the broad possibilities of research in their districts and that officers of the research departments should be prepared to tour and visit any district where a local officer showed any disposition to co-operate in research matters.

In reply to sub-paragraph (*c*) of this question, I would suggest that the possibility of introducing and cultivating such varieties of Artemisia as Brevifolia and Cinna with a view to the production of Santonin should be enquired into.

QUESTION 2.—AGRICULTURAL EDUCATION.—Agriculture as a profession is looked down on by educated Indians. The one ambition of the boys of this Agency, who have been to the Islamiah College at Peshawar, is to enter the Civil Administration and the Police. I have been trying without success to find a suitable boy to go to Lyallpur at Government expense.

If, as advocated in my general note, the District Officer was made to take a lively interest in agricultural matters, the Indian would, I think, be quick to follow suit, and the profession of agriculture would obtain much more standing. At Parachinar I am now beginning to try and stimulate an interest in agriculture, bee-keeping and poultry raising by teaching these subjects in the middle school, by showing cinematograph films of agricultural subjects, and by editing a fortnightly paper in which agriculture looms largely, but I feel that there are extraneous aids which must entirely depend for their success on the fact that the pupils at the school feel that higher authority itself takes a lively interest in agriculture.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—The most effective method to improve the practice of cultivation is to show that it will pay. As advocated in my general note, a demonstration farm should be in the charge

of the Deputy Commissioner at every district headquarters, to bring home to the individual cultivators the fruits of the Agricultural Department's work.

Such small farms could avoid the disadvantage of the big agricultural stations, due to the scale on which they are run, which always appears to the Indian as something which he can never hope to attain to, and therefore as impracticable.

If, as advocated, the District Officer were made responsible for the agricultural development of his district, many a zamindar who at present tries to win the regard of his Deputy Commissioner by assisting in police work, administration, etc., will be only too ready to adopt improved methods of agriculture, if he knows that such activities are in favour with the authorities.

QUESTION 4.—ADMINISTRATION.—It would seem to me that, in special trades such as pisciculture, bee-keeping and possibly poultry farming, it would be better to pool the services of experts. This is in keeping with my general thesis that the initiative, guidance and control must come from above and the execution from below.

QUESTION 5.—FINANCE.—If, as I have recommended, the District Officer should run a demonstration farm at the headquarters of his district, a way of financing his operations would be by lending money to cultivators. Such credit operations could perhaps be best conducted on the lines adopted by the co-operative credit societies, but I would strengthen the hands of the District Officer by allowing him to employ purely executive methods very freely. In the Kurram we have a quasi-co-operative credit society which is in a very flourishing condition, and no difficulty is experienced in effecting recoveries.

There are no hard and fast rules regarding rates of interest, method of repayment, amount of original loan, which are all left to the discretion of the District Officer.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—Owing to the fact that the ordinary administrative machinery is not in force in the Kurram, where justice is administered according to local custom and usages, there is no problem of agricultural indebtedness. In the Valley the Hindus are the debtors and the cultivators the creditors.

When I was Assistant Commissioner in the Mansehra Sub-division of the Hazara District, I studied at length the question of indebtedness, and came to the conclusion that if Government helped the people to form a society to exploit scientifically the village forests, the owners could free themselves from the clutches of the moneylender. In one particular case I succeeded in getting the forests of a large landowner taken over by the Court of Wards with the result that the owner is now on his way to pay off his debt. If left to himself, the landowner in question would never have been able to get out of the moneylender's clutches.

I quote this example, because it suggests that the problem of indebtedness is not being sufficiently considered by Government, and that there are probably other local cases which are equally susceptible to treatment provided an effort was made at diagnosis.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—I am attempting to tackle this problem in the Kurram by trying to find a corporate body that represents the interests of the various sections of the population. For example, we have at Parachinar the Shiah Matam Khana or mosque which, to a great extent, represents the Turi interests and the Sunni mosque which represents those of the other tribesmen.

Major E. W. C. Noel.

I am hoping to get the Matam Khana to lay out a commercial orchard. Before attacking the evils of fragmentation it is necessary to demonstrate its defects and the advantages of large holdings.

QUESTION 8.—IRRIGATION.—I have dealt with this subject in detail in my general note. I would however offer the following supplementary remarks.

Impressed by the possibility of finding underground sources of water which could be tapped, I obtained the loan of a Mansfield Mechanical Water Finder and found indications of water in many places. These readings were sent to Major Pogson, Water Diviner to the Bombay Government who, after studying them, expressed his opinion that on the Parachinar Plain which is about 30 square miles in area a number of sites for wells could be located in which water would probably be struck at a depth of about 50 feet and which would give from 2,000 to 3,000 gallons an hour. A report was made to the honourable the Chief Commissioner who has asked the Government of India for a budget provision to cover the cost of Major Pogson's deputation.

QUESTION 11.—CROPS.—I have dealt with this matter in detail in my general note. We are here trying to replace the local wheat by Pusa 4, maize by Swabi White and Shaftal by Egyptian clover. In this we are merely acting as a branch of the N.W.F. Province Agricultural Station at Tarnab, whose work would ordinarily be scarcely felt here.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) In the Kurram the average cultivator works on about 140 days in the year. During the slack season he does nothing except collect firewood and make a few articles such as grass shoes and ropes.

(*c*) I have already discussed the question of subsidiary industries in my general note.

QUESTION 19.—FORESTS.—There are many thousand acres in the Kurram Valley which are capable of afforestation.

Experiments conducted here show that many valuable trees such as walnut, Robinia, Pseudo acacia, Celtis Australis, Pistachia Integerrima, etc., can be grown without irrigation, provided they are suitably mulched. I have represented to higher authority the possibilities that exist, but was told that nothing could be done till sanction was obtained to the appointment of a Forest Officer to the N.W.F. Province whose special duty it would be to enquire into forest questions in those districts where no Government forest exists, i.e., in all districts of the N.W.F. Province except the Hazara District.

The Deputy Conservator of Forests, Hazara, mentioned to me that the N.W.F. Province will be faced in a very few years by a fuel shortage. The Kurram Valley lends itself to the planting of fuel plantations, as timber could be cheaply floated down the river to the Bannu District which is one of the first to feel the fuel shortage when it comes.

QUESTION 22.—CO-OPERATION.—Please see my replies to Questions 6 and 7.

QUESTION 23.—GENERAL EDUCATION.—QUESTION 24.—ATTRACTING CAPITAL.—Please see my replies to Questions 2 and 3.

Memorandum No. 735, dated, Parachinar, the 20th November, 1926, from Major E. W. C. Noel, C.I.E., D.S.O., Political Agent, Kurram, N.W.F. Province, to the Secretary to the Honourable the Chief Commissioner, N.W.F. Province, on the subject of the Development of Fruit Culture, &c., in the Kurram Valley.

Please refer to your No. 510-12/P, dated 4th January. 1926.

A grant of Rs.2,000 was made for the development of fruit culture in the Kurram for the two years 1925-26, 1926-27, and the Government of India asked for a report towards the end of the year 1926-27 as regards the prospects of the scheme becoming self-supporting.

The conditions in the Kurram are so varied that experimental work on crops and nurseries for raising trees for distribution must necessarily be somewhat scattered. This element of diffusion has been still further increased by the fact that Government land, water and labour were lying idle at different places in the Agency.

The following are the localities where work is in progress:—

At Peiwar (7,000 feet) and Mir Jemal (4,500 feet) about 4 acres of Government land and water appertaining to the Rest Houses have been planted as orchards and the chaukidars turned into Malis.

At Nurki (6,000 feet), 20 acres of land acquired by Lord Roberts in 1878 as a standing camp but since allowed to degenerate into a useless jungle is being planted as a demonstration commercial orchard with pears, apples, chestnuts.

At Parachinar (5,600 feet), 10 acres of existing orchard is being opened up and useless trees eradicated while a further 20 acres is being used for growing staple crops of new varieties, the seed of which is being distributed to zamindars.

At Alizai (3,500 feet), in the Lower Valley, about 3 acres of existing garden which was in a very poor state is being used for demonstrating fruit trees and field crops such as would not stand the colder climate of Parachinar.

It will thus be seen that about 44 acres of land has been brought under cultivation and about 13 acres already existing has been greatly improved.

The following notes will show the nature of the work undertaken:—

FRUIT CULTURE.

Orchards planted.		*Nurseries established.*	
Name.	*No.*	*Name.*	*No.*
Pear	677	Pear	3,332
Pomegranate	444	Apple	2,209
Apricot	308	Walnuts	1,880
Plum	270	Apricot	900
Vines	160	Almonds	800
Apple	90	Chestnuts	568
Peach	78	Vines	195
Oranges	49	Pomegranate	130
Lemons	2	Peach	100
		Plum	57

General experimental work on fruit culture.—100 trees of the Japanese persimmon were imported from Yokohama and about 80 per cent. are living. The local persimmon is one of the commonest tree in the Valley and next year we shall be in a position to propagate on a large scale the Japanese Persimmon by grafting or budding on the local stock.

Experiments have shown that apricots and walnuts will grow on the extensive barren plain surrounding Parachinar withou irrigation provided

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the trees are suitably mulched. It is proposed to establish extensive orchards on this land which at present only provide indifferent grazing.

Staple Cross.—Pusa 4 wheat, Swabi White Maize and Egyptian clover have been introduced and planted in demonstration areas alongside the local varieties. The results have elicited many requests for seed and next year we hope to be in a position to issue the following quantities:—

Pusa 4	150	Maunds.
Swabi White	50	,,
Egyptian Clover	2	,,

So far we have not been able to experiment with rice but intend to do so next year.

Arboriculture.—Among many trees introduced from Europe the following have been proved to do well:—

Oak	1,228
Mountain Ash	532
Beech	192

Experiments have been made to find a tree that will grow on the Parachinar plain without irrigation and the Celtis Australis, Robinea Pseudo Acacia and walnut have all been found satisfactory in this respect provided they are adequately mulched.

Among experiments made with many other varieties of trees the following have so far given very hopeful results but it is still too early to arrive at any definite conclusion:—

Pinus Gerardiana or Edible Pine.
Pinus Pinea.
Pine Maritime.
Pistacia Integerrima.
European Olive.
Bat Willow.

For the many arid tracts in the Lower Valley efforts are being made to establish the mesquita bean. About 2,000 plants in "Mazri" baskets have been planted and distributed to Maliks of villages.

The following trees have been planted out either along the roadside in the Military Camp, in the new bazaar or in plantations:—

Name.	*No.*	*Name.*	*No.*
Prosopis	800	Plum	57
Shisham	500	Pistacia Integerrima ...	41
Walnut	474	Cupreseus	39
Safedah	326	Pear	38
Rubinea	255	Horse Chestnut	29
Olive	250	Pinus Longifolia	26
Chinar	220	Spanish Chestnut	14
Amlok	86	Gledischia Ferox	2
Celtis Australis	70		

About 3 acres of land have been devoted to nurseries which now contain over 21,000 plants. A list is attached to this report.

Shrubs and flowers.—About 50 varieties of ornamental shrubs were obtained from Europe and many of them are doing well.

Fodder grass.—The South African grass *Kikiuya* has been planted at Alizai and a considerable quantity has been planted out along the banks of irrigation channels.

Herbs and miscellaneous.—*Kuth.*—With the present market price of Rs.450 per maund the cultivation of *kuth* is likely to prove of the greatest value. Seeds and roots were obtained with great difficulty from Kohistan and appear to be doing well on the Sufed Koh at an elevation of between 9,000 feet and 10,000 feet.

Artemisia.—Specimens of all the Artemisia found growing locally were sent to England with a view to ascertaining the Santonin content. The results of the analysis are awaited. (The analysis results have since been received and show that Santonin is present.) Seeds of Artemisia Brevifolia which contain Santonin were obtained from Kashmir and did well. The flowerlets and leaves have been sent to England for examination. Efforts have been made to obtain seed of Artemisia Cinna from Turkistan through the good offices of H.B.M.'s Consul-General, Meshed, but so far without any result.

Podophyllum Emodi.—This valuable plant is very common on the Sufed Koh. Plantations; have been established at a height of 10,000 feet, but many years must elapse before any definite conclusions can be obtained.

Perovskia Atriplicifolia Benth.—This is a very common flowering shrub with a strong aromatic odour. A consignment was sent to the Forest Research Institute at Dehra Dun which yielded 2 per cent. of an essential oil which has been sent to England for report as to its commercial possibilities. Experimental plots of *Perovskia* have been established to ascertain the yield per acre.

It will be seen from the above notes that the work being done at Parachinar is of a very varied and valuable nature. The operations are in charge of a trained Agriculturist, Mohammed Amin Khan, posted here by the Agricultural Officer, N.W.F. Province. He employs 20 men permanently exclusive of chaukidars of rest houses. The work is supplemented by jail labour. Three local men have been sent to Tarnab Farm for 18 months' training and will then replace the trained men lent from Tarnab. If we consider only the 30 acres which is already a going concern and exclude further experimental developments and 24 acres which remain to be planted as orchards, the scheme would pay its way next financial year. However, I think it would be a pity to curtail our activities, and I trust that the Government of India can see its way to include a further sum of Rs.2,000 in the Budget Estimates for the next two years, i.e., 1927-28 and 1928-29. Necessary provision has already been made in the Budget of 1927-28. Since April 1st this year actual receipts from sale of crops, &c , have amounted to Rs.3,400, and the total estimate up to March 31st, 1927, is Rs.5,200. The expenditure properly debitable to this head is:—

Labour	Rs.4,000
Contingencies	Rs.1,200
Total	Rs.5,200

The grant of Rs.2,000 and the Budget allotment under head of Arboriculture have been devoted to the research and other activities already referred to.

An increase in revenue may be expected next year from—

(*a*) Sale of nursery plants.

(*b*) Sale of produce from land recently brought under cultivation.

The orchards planted will not begin to give any appreciable return till 1928."

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LIST OF THE NURSERY PLANTS GROWN AT ALIZAI, MIRJEMAL, PARACHINAR, SHALOZAN AND PEIWAR.

Serial No.	*Name of plants.*	*No.*
1.	Pear suckers	3,000
2.	Broom	2,500
3.	Walnuts	1,880
4.	Pinus Longifolia ...	1,550
5.	„ Pinea	617
6.	„ Conariensis ...	50
7.	„ Halepensis ...	32
8.	„ Insignis	13
9.	Maritime pine	1,489
10.	Prosopis	1,112
11.	Apples budded	1,050
12.	Spirea	815
13.	Almonds seedlings ...	800
14.	Shisham seedling (Dalbergia sissoo).	700
15.	Rosa Damascena ...	655
16.	Amlok	375
17.	Cupresus Semperverens...	371
18.	Horse Chestnut	370
19.	Pears budded	332
20.	Hibiscus	308
21.	Budlia Variabilis ...	274
22.	Chinars	260
23.	Raspberries	200
24.	Apricot seedlings ...	200
25.	Grapes Quetta	185
26.	Poplar	170
27.	Robinea	140
28.	Bakain	137
29.	Celtis Australis	120
30.	Koelreutoria Paniculata	111
31.	Argoiser	111
32.	Red Mushk	110
	Carried forward ...	20,037

Serial No.	*Name of plants.*	*No.*
	Brought forward ...	20,037
33.	Kaghazi walnuts ...	110
34.	Quercus Macrocarpa ...	20
35.	„ Palustris ...	100
36.	„ Subra	13
37.	„ Rubra	6
38.	„ rubra Pedunculata, Female Oak.	1
39.	Peaches budded on peaches	100
40.	Pomegranates, Shaharanpur.	74
41.	Cytisus Laburnum ...	72
42.	Dwarf Furze	68
43.	Pin Oak	59
44.	Japanese plums budded on peach stock.	57
45.	Ginko Biloba	54
46.	Durantha	48
47.	Pomegranates, Khandahari.	46
48.	Pomegranates, Muscat...	10
49.	Eucalyptus	45
50.	Hazelnut...	24
51.	Spanish chestnut ...	24
52.	Cercis Siliquastrum ...	19
53.	Sophora Japonica ...	19
54.	Douglas Spruce	16
55.	Amlatas	16
56.	Kuth	15
57.	Araucaria Imbricatea ...	9
58.	Legastromea	4
	Total	21,066

Oral Evidence.

48,106. *The Chairman*: Major Noel, you are Political Agent of Kurram in this Province?—Yes.

48,107. At the commencement of your written evidence you emphasise the importance of the District Officer taking a direct interest in agriculture and in the general economic welfare of the population. Is there anything in the present regulations or state of affairs that prevents a District Officer taking such interest?—It is not expected of him.

48,108. He is not definitely instructed to take part in agricultural progress?—No.

48,109. *Mr. Calvert*: You are referring to this Province?—My only experience is in this Province. It is appreciated if you do, but it is not expected of you.

48,110 Is it not prescribed in Government circulars?—Not that I am aware of.

48,111. The Government Consolidated Circular describes the duties of a Deputy-Commissioner. Does not that lay on him the burden of responsibility for the economic progress of the district in his charge?—It may be laid down, but in practice it is not expected of him.

48,112. *The Chairman*: On page 134 you suggest agriculture should be made one of the subjects for the I.C.S. examination, and that a young officer on arriving in India should undergo a practical course of training at an agricultural college and station. In addition you suggest that a course in engineering, building and construction should be undergone. Do you think that there is time to teach officers of the I.C.S. enough of those rather technical subjects to be of use to them?—From my own experience I think there is, and in view of the value it will be to them later on, I think that the time would be well spent. The knowledge regarding possibilities of agricultural improvement and development has not been applied to the extent of perhaps one per mille in the field that is available in India. I submit that the problem of widespread application is far more of an administrative than of an agricultural character. It is for this reason that I recommend that the problem can best be tackled through the agency of the District Officer. To help the District Officer to do so, a measure of agricultural knowledge and training is necessary, but it is not suggested that he should encroach on the legitimate functions of the Agricultural Department. His agricultural knowledge and training will be merely aids to assist him in dealing with what is primarily an administrative task.

48,112A. In your experience, do most District Officers in fact take an interest in agricultural progress and general economic advancement?—I do not think they take as much as they should.

48,113. From what you say on page 137 I notice (and I am surprised to hear it) that you have been trying for a long time without success to find a single boy whom you regard as suitable to go to Lyallpur at Government expense?—It seems impossible to find one. Their one idea is to get into the Police or the Administration.

48,114 Not a single likely boy was willing to go to Lyallpur?—No, and it was to be entirely at Government expense. We have not found one yet.

48,115. What has been your method of searching for such a boy?—We have five boys at the college here, and I wrote to Mr. Martin a few months ago asking him to try to persuade one of them to go, but he said he had talked to them and they would not go. All of them wanted to get into the Police or Administration. I have an Agricultural Assistant (one of Mr. Robertson-Brown's men), and one day he complained to me bitterly that he had been referred to by another official as a *mali*. The Agricultural Department has no status at present.

48,116. On page 138, in answer to Question 3, you say: " Many a zamindar who at present tries to win the regard of his Deputy-Commissioner by assisting in police work, administration, etc., will be only too ready to adopt improved methods of agriculture if he knows that such methods are in favour with the authorities? "—Yes. Several zamindars have actually said to me in the Kurram, when I have been trying to inculcate an interest in agricultural development: " Yes, but you will be going soon, and your successor will certainly not take any interest in it at all. No one yet has taken any particular interest; you are an exception. What is the good of our doing anything ? "

48,117. You judge from that that if the ordinary average officer did take an interest the effect would be that zamindars would be prepared to go in for improvements?—Yes. It would set a fashion.

48,118. If a man does go in for experiments designed to improve agriculture, and if he undertakes improvements in agricultural practice, is his prestige among his neighbours raised thereby?—I do not think so, at present.

48,119. Public opinion does not hold such efforts in high regard?—No.

48,120. One thing you say on page 138 surprised me a little. Speaking of agricultural indebtedness, you say: "In the Valley the Hindus are the debtors and the cultivators the creditors." That is rather unusual?—Yes. I suppose it is the only place in administered India where it does exist.

48,121. How do you account for that state of affairs?—The Valley is administered by a system of law which is based on indigenous practice and custom. The British law of India does not exist in the Kurram, and public opinion there would never tolerate usury as it flourishes under British law.

48,122. Is it the existence of a different law or the absence of any exact law?—It is the fact that usury has never been able to establish itself, because it has not had the support of British law.

48,123. What happens if a creditor attempts to charge too high a rate of interest?—He would never get it.

48,124. What happens if the cultivator, from one cause or another, fails to pay his instalments as they fall due and so his debt accumulates?—The debt would not be allowed to accumulate. A reasonable composition would be arrived at.

48,125. Quite a good place in which to live?—Yes.

48,126. You say: "When I was Assistant Commissioner in the Mansehra subdivision of the Hazara district I studied at length the question of indebtedness and came to the conclusion that if Government helped the people to form a society to exploit scientifically the village forests the owners could free themselves from the clutches of the moneylender." I do not quite understand how that would operate?—In the Hazara district the zamindars own large areas of forest which at present are not administered scientifically in any way, and the result is that the timber which exists is not exploited. If that timber were exploited properly it would be possible to arrive at some composition with the moneylender so that debts could be paid off by instalments.

48,127. First dealing with the commercial side, are communications available for getting the timber out?—Yes. There are Government forests alongside which are run at a considerable profit. I may mention that a big Indian banker offered to put up 10 lakhs to finance the scheme. He was a man who had had considerable experience in dealing with timber, and who had made his money in timber.

48,128. You think it would be necessary to provide some system of control if your plan were adopted, in order to prevent too much timber being cut and the forest being destroyed?—It would have to be exploited on exactly the same lines as the present Government forests.

48,129. And would require as much control?—Yes. I succeeded in getting one area taken over by the Forest Department, and I understand that particular zamindar is now on his way to solvency.

48,130. While on this subject, are there areas in this part of the country where deforestation has taken place to any serious extent?—Deforestation took place so many years back that it is difficult to visualise its extent, but in the Kurram deforestation is taking place rapidly on the sides of the Safed Koh, because there is no conservation of any sort.

48,131. Is soil erosion taking place as a consequence of the deforestation?—Undoubtedly.

48,132. Within your experience, have lands that used to be available for grazing or grass-cutting ceased to be available in consequence of this erosion? No, not within my three years' experience of the Kurram.

48,133. Things have not reached that stage?—No.

48,134. Apart from what you say about irrigation in your general note, I see that on page 139, in answer to our Question 8, you say you obtained a loan of a Mansfield mechanical water finder. How much reliance can be placed on the indications of a machine of that sort?—According to the reports of the Bombay Government, who have been using it for many years, considerable reliance can be placed on it. I got a most interesting brochure from them describing how the indications of the mechanical water finder were checked by the water diviner, Major Pogson, and were corroborated in every case except two. I think Major Pogson selected 78 sites and the water finder confirmed 76 of them.

48,135. Were wells dug?—Yes, and water was found.

48,136. Have you any reason to think that the water would be within reach?—The Bombay Government have been doing very careful research work on readings, and Major Pogson wrote to me and said he had compared the readings I had got with the Bombay records, and had great confidence in being able to find water at a depth of 50 feet, which would be ideal from our point of view because it would eliminate lift. We have a glacis slope of 1 in 20 and would have to dig a channel about 1,000 feet long to get the water out on the ground level.

48,137. Would a venture of that sort require to be financed by Government?—Yes, and the Chief Commissioner tells me he has asked for a special grant of Rs.5,000 to cover Major Pogson's deputation for one month in June. That is the month when, owing to the monsoon conditions, he cannot work in Bombay; otherwise he could not be spared.

48,138. Do the cultivators in your district cultivate the same territory year after year, and remain on the land?—Yes. They have a good rotation and so on; the system of cultivation is good.

48,139. *Sir Ganga Ram*: Is not the fact that District Officers are not taking much interest in agriculture due to their constant transfers?—Yes, to a great extent it is.

48,140. Would you lay it down that they must remain five years at least? —I think five years should be the minimum.

48,141. I have heard from another source what you say about boys taking to agriculture. I visited a mission college and asked the boys what career they wanted to take up, and they said the Police or Administration. I suppose there is more money to be made in those two departments than in any other?—Yes. It is a question of money and *izat;* there is a great deal in status. If you are in the Police or the Revenue there is more chance of promotion and of being in the public eye.

48,142. To whom do these private forests in the Hazara district belong? —The villagers.

48,143. As "*shamilat*"?—In some cases; in others there is individual ownership.

48,144. How do they cut it?—They cut it with the sanction of the Deputy Commissioner; he sanctions the cutting of so many trees. There is no rule or order about it.

48,145. Such a rule could be made by reference to the Chief Commissioner? —The practice is that if an individual or a group of villagers put up a petition that they want, for example, to rebuild a mosque or build a school the cutting of, say, 50 trees may be sanctioned and those trees are selected,

but there is no proper scientific exploitation of the forests such as is practised by the Forest Department.

48,146. Have you no District Engineer in this Province?—My experience of this Province is small, but so far as I know there are none. You have to rely on the Military Works Services for expert advice.

48,147. There is no District Engineer to give advice on minor irrigation works?—No. I spoke to Mr. Walker and he told me it was not his business; as a personal arrangement, he said he could give me advice on a particular project, but no assistance in carrying it out.

48,148. His business is entirely technical. Has your Deputy Commissioner no District Engineer here?—In the Kurram there is no District Engineer to whom one can refer.

48,149. Have you, in the Kurram, a plateau which could be irrigated? —There are large areas which could be brought under irrigation.

48,150. And on which some of these turbulent tribes could be got to settle? Would they settle?—No. From the local political point of view, there are strong objections to such a policy. The areas which could be irrigated in the Kurram are more in the nature of extensions of present areas. It is not so much a matter of bringing new areas under irrigation but of increasing the area in each village by small improvements to water channels. The problem is largely that of carrying the water channels over ravines. At present there is a great loss of water in such crossings. I think that on an average the area irrigated could be increased by 25 per cent. if the water was carried over ravines by aqueducts.

48,151. Have you a report of the Bombay Government on this water finder?—Yes.

48,152. I know of places where he has failed?—Their report, which I have got, is that in a period of nine months he had 100 per cent. successes.

48,153. In these hills where you say the water can be brought to the ground level, is it sand or rock or what?—Hard gravel.

48,154. You can tunnel through?—Yes.

48,155. *Sir Thomas Middleton*: How did you come to take a special interest in agriculture? Was the need for it forced on you by your experience here, or have you always been interested in the subject?—As I tried to make out in the preface to my note, it struck me as being the best way of getting in touch with the people. It creates a more human bond between you and the people if you take an interest in something which conduces to an increase in their material prosperity.

48,156. It was your experience in India which led you to this conclusion? —I had never taken the least interest in agriculture before I came to this Province; I knew nothing about it, and I felt my complete ignorance of the subject was a great handicap.

48,157. You think all officers joining the Indian Civil Service should have some training in it?—Certainly.

48,158. What length of course do you suggest they should get in India? Have you thought it out?—I think six months would be sufficient if they had had a grounding at Home.

48,159. I am afraid they could not get a grounding at Home?—Then a longer course would be required out here.

48,160. What kind of course are you thinking of? As I read your note, it seems to me you want to make the young officer aware of the possibilities of improvement in India, and of what is being done by the Agricultural Department in this country, at the outset of his service?—Yes.

48,161. *Sir Henry Lawrence*: Do your remarks on the lack of interest of such officers apply to other Provinces than this?—I have never served in other Provinces. Before I came here I served only in Persia, where I was for 10 years.

48,162. *Sir Thomas Middleton*: I think in some Provinces young officers are strictly enjoined to interest themselves in the subject as soon as they come to this country.

48,163. *Sir Henry Lawrence*: That is the case in Bombay.

48,164. *Mr. Calvert*: And in the Punjab.

48,165. *Sir Henry Lawrence*: Your remarks apply to this Province only? —Yes, in that it is the only Province of which I have any experience. I did my training at Meerut in the United Provinces, and certainly there was no inducement whatever to take any interest in agriculture. I was there 1½ years as Assistant Commissioner and I saw no trace of it there whatsoever. That was 10 years ago.

48,166. *Mr. Calvert*: Did you not do settlement training?—Yes, but there was no real inducement to take an interest in agriculture or in its improvement. You were taught a certain amount about crop returns and things like that, but nothing more.

48,167. *Sir Thomas Middleton*: You had no hint as to the possibilities of improvement?—No.

48,168. You feel that much more should be done by way of demonstration farms in the area?—Yes.

48,169. You suggest placing such farms under Deputy Commissioners, but would it not be necessary to have a trained assistant in charge of each farm?—Yes. I think I mentioned in my written evidence that the drive must come from the District Officer but that he must have at his disposal technical advice for carrying out his schemes. At present I have an Agricultural Assistant from Tarnab farm.

48,170. The Deputy Commissioner should borrow from the Agricultural Department an assistant who should work under him?—Yes.

48,171. You have started a fortnightly paper in your district?—Yes.

48,172. By whom is that paper read?—It is distributed to all the schools where it forms a text-book for the children to read. To a great extent the boys repeat to their fathers what they have read during the day. We have in addition about 200 subscribers who take it in and pay for it, but I do not know whether they read it.

48,173. How many schools have you in your district?—Thirteen primary, and one secondary.

48,174. *Sir Ganga Ram*: In what language is your paper written?—In Pushtu. If it were in Urdu nobody would read it.

48,175. *Professor Gangulee*: Who edits the paper?—I do.

48,176. *Sir Thomas Middleton*: Do you introduce agricultural topics?— To a great extent. I write about Pusa 4 and give its yield as compared with the local wheat, and matters like that.

48,177. Is it exclusively agricultural, or do you make it of general interest?—Of general interest, but I try to bring in agriculture as much as possible.

48,178. It is meant to be a sort of reading course for the boys in the Kurram schools?—Yes.

48,179. *Sir Ganga Ram*: Have you seen a similar paper published in the United Provinces?—No.

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48,180. How many classes have you got in your primary schools?—Four classes.

48,181. Do the boys stay on till the fourth standard?—Yes.

48,182. Is the attendance pretty regular, or does it fall off very much in the later standards?—It tends to fall off.

48,183. Have you any vernacular middle schools at all?—There is both a vernacular and an Anglo-Vernacular middle school at Parachinar.

48,184. What is the attendance at the vernacular and the Anglo-Vernacular? Which is more popular?—The Anglo-Vernacular.

48,185. How many students does that school draw?—One hundred and thirty.

48,186. And the vernacular school?—I could not tell you offhand.

48,187. *Professor Gangulee*: You suggest that the officers should undergo a practical course of training, but you do not suggest the period of the training. How long do you think it should be?—If it is impossible to give them any grounding at home before they come out, then I should think nine months to a year would do.

48,188. You do not think a short course could be made sufficiently effective?—In my own case I feel that a six to nine months' course would be of great assistance to me, but I do not think that my opinion on this subject is of very great value.

48,189. Are you in touch with any demonstration work that is going on in this Province?—Yes; I always visit the Tarnab Farm two or three times a year and take my cue from Mr. Robertson-Brown as to the work to be done in the Kurram.

48,190. Do you think that the demonstration should be carried out at demonstration farms or on the cultivator's own land?—I think that you want a demonstration farm in which you can show staple crops of the varieties recommended by the Agricultural Department, with your local crops growing alongside them. We had a most excellent example last year. We had half an acre of Pusa No. 4 and half an acre of the local wheat planted side by side; the whole of the Pusa wheat was standing upright while the whole of the local wheat had lodged.

48,191. You know this Province and the people for a long time I suppose?—No, I have only been in the Kurram for three years; before that I was only nine months in Hazara.

48,192. Do you find any change for the better in the standard of living?—Yes, a distinct rise.

48,193. With regard to indebtedness, you say that in the Kurram you have a quasi-co-operative credit society which is in a very flourishing condition and no difficulty is experienced in effecting recoveries. What do you mean by that?—It is not registered under the Act and we are not bound down by any bye-laws.

48,194. *Mr. Calvert*: Do you know Mr. Brayne's work in Gurgaon?—I have heard and read about it in the papers.

48,195. There is a striking similiarity in the ideas of Mr. Brayne and yourself. On this question of agricultural training I just want to clear up one point. Are you not aware that there is a regular scheme whereby all young Indian Civil Servants are given facilities, or can be given facilities, for undergoing agricultural training in England?—No, I did not know that.

48,196. There is a Government order on the subject. On this minor question of your getting trees for planting, do you take any expert advice on the kind of trees to plant?—Yes, I write to the Forest Research Institute, Dehra Dun, for their views, and Mr. Robertson-Brown visits the Kurram regularly coming up several times. The Divisional Conservator of Forests of Hazara also came up on deputation for a week.

48,197. On this question of Kulu trout, can you say what kind of temperature you have got there?—We have sent our temperature charts to Mr. Mitchell and he said that our temperatures are all right; I think 65° was our maximum.

48,198. Who is to be the consumer of these trout?—It has a very limited market, but I think in this Province you could sell the trout to the European community.

48,199. Is Mr. Donald not allowed to come and see you at Parachinar?—We wrote to him and he said he could not come.

48,200. Did you apply through your own Government?—We were in direct correspondence with him.

48,201. You did not try to get your Government to agree to pay his travelling expenses?—That question did not arise; he gave no reasons as to why he was not able to come.

48,202. I am sure it was not his own unwillingness. You mention cinematograph films in agricultural subjects. Where do you get those from?—From Patel Bros. at Bombay.

48,203. Do you find them suitable for Parachinar?—They are not entirely suitable. I have written to the G.I.P. Railway Publicity Department and they have promised me some of their films.

48,204. On this question of using village trees for getting rid of debt, was that idea drawn from the Panjawar experiment in Hoshiarpur, or was it one that came to your own mind?—It was an idea of my own.

48,205. It is a perfectly simple proposition, is it not, if you could get the people to agree?—Yes; you would require an officer on special duty for it.

48,206. Practically where they all have rights they will not subordinate those rights to the common good?—No.

43,207. You have not succeeded in getting all the right holders to agree?—No; but I think that with patience and the leaven of a partition one could get the right holders to co-operate.

48,208. Does your Egyptian clover give fertile seed?—We do not know yet.

48,209. There is a big demand for Egyptian clover down country?—We have got white clover which is growing wild, which I understand is valuable and is in demand in Europe. We collected seed last year.

48,210. *Mr. Kamat*: About this idea of the District Officer taking an interest in agriculture: part of your scheme is that he should be provided with a farm, that there should be a budget provision for that farm and that technical advice should be given to him, and eventually that farm should be self-supporting?—Yes.

48,211. Now it may happen that one District Officer may be inclined towards agriculture as a hobby, whereas another District Officer may not; in which case what happens?—I think at present there are several branches of a District Officer's duties to which you might apply the same argument; he has got to do it because it is expected of him; of course, I agree that you will get an unevenness in results, but I do not see that that is a serious argument against the scheme.

Major E. W. C. Noel.

48,212. In any case it would be worth while to make an experiment by giving a farm to a man who does not like agriculture or who does not like Indians coming near about his bungalow, and to see how this outlook eventuates?—Yes.

48,213. If, on the whole, supposing there are 25 districts in this Province and, say, 20 District Officers are useful in this direction, do you think the whole scheme would be justified?—Yes.

48,214. You said you were arranging for the deputation of Major Pogson from Bombay to the Kurram Valley. Have you heard that there are, amongst Indians, people who could be called water diviners?—I have heard that the power of water divining may be latent in any person; it has only got to be discovered, so that I presume there are many Indians who have got that power.

48,215. Do you also know that a large percentage of the innumerable wells in the country has been dug at the instance of these so-called indigenous water-diviners?—No.

48,216. Those people are called *pannadas* in my part of the country. My point is that you should get hold of these people and test and verify how far their divination is correct, just as, in the case of Major Pogson, his abilities were tested. Perhaps, having done that, you will not have to go to Bombay for a water-diviner who will cost you Rs.5,000 a month?—Yes.

48,217. *Sir Ganga Ram*: Do you fully understand the principle of the Mansfield Mechanical Water Finder?—According to the brochure I got with it, it is supposed to be a secret, but the accepted explanation is that the underground water currents set up certain electrical disturbances within a certain area and these are reflected by a very sensitive galvanometer.

48,218. Do you know that a new method has been discovered on the wireless principle?—I have not heard of it.

48,219. One other question: is it your experience that the boys who have left the primary school after two years and gone back to the land have forgotten even the alphabet of the language which they have learned in school?—Yes, in the Kurram, because the teaching there is done in Urdu and so it means absolutely nothing to the boys; they forget it even within a few months of leaving school.

48,220. How would you improve such a state of affairs?—By imparting the education in Pushtu, their own mother-tongue, which I am trying to do.

48,221. *Sir Henry Lawrence*: What was the date of the Report in which it was stated that the Bombay Government found 100 per cent. successes in Major Pogson's work?—It referred to the period 1924-25; it is quite a recent report. When I was about to put up the case to the Chief Commissioner I obtained the Bombay Government's reports on Major Pogson's work, because I naturally wanted to make the case as strong as possible.

48,222. How many months ago was that?—I put up the case about three or four months ago; I cannot remember the exact date of the report.

The Witness: I should like to mention one point if I may be permitted to do so. It seems to me that the problem is to apply the knowledge that the research department have already given us. From my limited experience, I find that you are held up by absolute apathy on the part of the Indian cultivator; it is only by using some driving force that you can ever get him to do anything. It seems to me that the whole of your efforts should tend not towards trying to discover something new for him, but towards making him apply what you have already decided upon is best. Up in the Kurram, for instance, merely to try and replace the local

wheats by Pusa No. 4, or to try and get a better variety of maize would take up all your energies and all your time for a great many years.

48,223. *The Chairman*: Have you any idea as to how demonstration might be rendered more persuasive in its effect?—By their feeling that the interest which the District Officer takes is a continuous one and that it is shared by a higher authority, so that there may be an element of permanency about it. It is not enough just merely for one District Officer to come and evince a keen interest and go away, without his successor who comes after him taking the same keen interest; there should be a continuity of interest by the District Officers, and this would inspire the people with confidence.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Friday, March* 25*th*, 1927, *at Bombay.*

Major E. W. C. Noel.

APPENDIX.

Copy of a letter No. 314-G, dated the 15th February, 1927, from the Deputy Commissioner, Peshawar, to the Revenue Commissioners, N.W.F. Province.

Subject:—Questionnaire of the Royal Commission on Agriculture.

With reference to your endorsement No. 1622-N-Revenue, dated the 26th August, 1926, I have the honour to report as follows:—

(1) As regards market facilities and systems of marketing, etc. The bulk of buying in this District is done by village shop-keepers who, in their return, usually dispose of their produce to commission agents.

(2) Ways and means of improving existing systems of marketing. The only way in which more money can be brought into the pockets of the producer would seem to be by the creation of co-operative societies. Under present conditions in a large proportion of cases the crop is pledged in advance to the non-agriculturist shop-keepers, usually at a rate extremely favourable to the latter, and with reference rather to the immediate pecuniary necessity of the agriculturists than to the market price. The unfavourable position in which the agriculturist finds himself has been accentuated by the introduction of the Land Alienation Act, which makes borrowing extremely difficult.

(3), (4) and (5) The channel of distribution; the services rendered by intermediaries; and the margin on which intermediaries operate. The bulk of the wheat which leaves this district goes direct to Karachi. Messrs. Ralli Brothers seem to be now the chief exporting firm. Commission agents collect the wheat and pass it to the buyers; they also arrange conveyance and despatch by rail, for which they receive 1 per cent. on the value. In this process the weighman who packs the corn is paid two pice a bale or one pice a maund. Cartmen receive a varying scale which averages about two pice a maund per mile.

(6) The methods of finance or exchange. The commission agent pays on behalf of the firm and is reimbursed by cheques or *hundis*. As already pointed out, agriculturists frequently pledge their crops in advance at the best price that they can obtain from the money-lenders.

The merchants and commission agents are usually of comparatively sound financial position and do not require to borrow money. Those merchants who have to borrow usually receive money from other business men, the rate of interest being 9 per cent. per annum. Commission agents borrow at a similar rate. Wealthy Muhammadans in this District sometimes deposit their surplus funds with trustworthy and reliable Hindus, frequently drawing no interest, as this is prohibited in the Muhammadan law.

A great deal of corn is taken by shop-keepers from agriculturists in barter for the ordinary necessities of daily life.

(7) Organisation for securing purity, etc., of agricultural produce. Except for the examination of the buyer, who is, of course, an expert, no such organisation exists.

(8) Possibility of placing commercial information at the disposal of cultivators, merchants, traders, etc. The business men of all large markets, such as Hoti, Charsadda, Peshawar, etc., are in direct daily communication with Karachi and other important centres. I think individual transactions are on too small a scale to render possible any effective system. Education and co-operative societies may in time supply the present want.

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GLOSSARY.

ABIANA... ... ... Water rate.
ANNA ... ... One-sixteenth of a rupee; equivalent to 1$\frac{1}{8}$d. at exchange rate of one and sixpence to the rupee.
ARHAR... ... ... Pigeon pea (*cajanus indicus*).

BABU ... ... A title of respect.
BAJRA ... ... A small millet (*pennisetum typhoideum*).
BANIA ... ... A Hindu trader, who is generally also a money-lender.
BANJAR ... ... Barren, waste land.
BARANI ... ... Unirrigated land depending on rainfall for its water supply.
BATAI ... ... Payment of rent in kind, by division of produce between landlord and tenant.
BER ... ... A moderate sized, deciduous tree (*zizyphus jujuba*).
BERSEEM ... ... Egyptian clover (*trifolium alexandrinum*).
BHUSA... ... ... The husk or chaff of grain ; the straw.
BUND ... ... A dam, a field embankment.

CHAGHA ... ... Usually *chiqa*. Defence against raids.
CHAPRASI ... ... A messenger.
CHARI ... ... *Juar* (*sorghum vulgare*) grown as a fodder crop.
CHOWKIDAR ... ... A watchman.

DASTAK ... ... A summons or warrant.
DESHI (DESI) ... ... Indigenous, native to the country.
DHURRI ... ... A carpet.

EK FASLI ... ... One crop (per year).

FARDNAMBARWAR ... A statement showing particulars of individual holdings.

GHI ... ... Clarified butter.
GRAM ... ... Chick pea (*cicer arietinum*).
GUR ... ... Unrefined Indian sugar, jaggery.

HOOKAR ... ... A pipe, a smoking tube (hubble-bubble).
HUJRA ... ... A village meeting place.

ILLAQA... ... ... A district, jurisdiction.
IZAT ... ... Honour, reputation.

JAGIRDAR ... ... The holder of any assignment of land revenue, not necessarily the owner of the land.
JALAR ... ... A water-lifting device.
JERIB ... ... A varying measure of land, roughly half an acre.
JUAR(i)... ... ... The large millet (*sorghum vulgare*).

KALLAR ... ... Saline efflorescence.
KANAL ... ... A varying measure of land, generally one-eighth of an acre.
KHAN ... ... A Mahommedan title.
KHARIF ... ... The autumn harvest; crops sown at the beginning of the rains and reaped in October–December.
KHUSHAMID ... ... Bribery [lit. flattery].
KUTCHA ... ... Inferior, bad [lit. 'not solid'].
KUTH ... ... Catechu.

LAKH ... ... One hundred thousand.
LAMBARDAR ... ... A cultivator who pays the Government dues either on his own account or as the representative of other members of the village.

MACHAN ... ... A raised platform.
MAFI ... ... A grant of land free of assessment.
MAHAJAN ... ... A merchant, creditor.
MALI ... ... A gardener.
MALIK ... ... A cultivator proprietor.
MANDI ... ... A market.
MAUND... ... ... A weight of 82·28 lb. (*pucca maund*). Has different values for different commodities and for the same commodity in different localities.
MOHMAND ... ... One of the frontier tribes.
MOTH ... ... The kidney bean (*phaseolus aconitifolius*).
MUHARRIR (MUBERRIR) A clerk, writer.
MULAQUATI ... ... One who is granted an interview.
MUNG ... ... Green gram (*phaseolus radiatus*).
MUNSHI ... ... A clerk, teacher.

NAWAB ... ... A title of honour.

OROBANCHE ... ... Broom rape, parasitic on tobacco.

PATHAN ... ... A Muslim tribe found chiefly in the frontier districts and West Punjab.
PATTA ... ... A lease.
PATWARI ... ... A village accountant or registrar.
PUCCA ... ... Solid, correct, complete, &c. (the contrast in all respects to *kutcha*).

RABI ... ... The season of spring; crops sown in autumn and reaped at the end of the cold weather.
RAJ ... ... The governing authority.
RAJA(H) (plough) ... A type of inversion plough.

SHAFTAL ... ... Persian clover (*trifolium resupinatum*).
SHAMILAT ... ... Village common, usually used for grazing.
SHISHAM ... ... A deciduous tree (*dalbergia sissu*).
SOWCAR ... ... A money-lender.
SWARAJ ... ... Self government.

TACCAVI ... ... An advance made by Government to cultivators for agricultural purposes.
TAHSIL... ... ... A local revenue division of a district.
TAHSILDAR ... ... A revenue officer in charge of a *tahsil*.

VUND ... ... A distribution of land.

ZAILDAR ... ... A revenue officer in charge of a group of villages.
ZAMINDAR ... ... A landowner, generally a peasant proprietor.