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Saturday, February 12th, 1927.

CAWNPORE.

PRESENT:

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

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

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S. } *Co-opted Members.*

Raja Sir RAMPAL SINGH

Mr. J. A. MADAN, I.C.S. } *Joint Secretaries.*

Mr. F. W. H. SMITH,

Mr. SAM HIGGINBOTTOM, Principal, Allahabad Agricultural Institute.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (i) The greatest drawback to the present Indian agricultural research programme is that it is inadequate to the needs of India. I doubt if any group of scientists can show much greater results during the same period than those of the Indian Agricultural Service, but there have been too few of them. They have been inadequately financed and have not had sufficient trained assistants nor sufficient official encouragement to do the work India needs to be done.

There is need for Pusa, where certain problems for the whole of India can be worked out. But Pusa is hard to get to; not all the problems for the whole of India can be worked out there. In addition to Pusa, there should be other properly equipped and staffed research institutions, not necessarily provincial but located with respect to the factors of soil, climate, altitude, rainfall, etc. To develop provincial *esprit de corps* and loyalty it might be well to have such institutions under the Provincial Government in whose areas they are located. Pay and prospects in these provincial institutions should be equal to those of the Imperial Research officers if their work is up to standard. At present a Pusa appointment is a plum which frequently attracts a man well prepared to continue in his provincial appointment, where he has served his apprenticeship, and is ready, if left alone, to make a real contribution to the betterment of local agriculture.

There should be the closest co-operation between the Imperial and the Provincial Research Departments. The Imperial should be able to act as a liaison office and might suggest to the different provincial institutions problems of local or provincial interest as well as problems relating to the interests to India as a whole.

(ii) *Veterinary Research.*—The Veterinary Department should have charge of all study of animal diseases, including their prevention and cure. The present staff of the Veterinary Department is pitifully small and should be very greatly enlarged. A great many valuable animals now die each year because they are beyond the reach of any veterinary assistance whatsoever.

A course of lectures by a veterinary officer should also be given in every agricultural college, not with the idea of making every agricultural graduate a veterinarian, but to enable the student farmer to tell whether the ailment is simple, like a gall or bruise, or whether it is serious and needs the treatment of a qualified veterinarian.

I do not favour the veterinarians having charge of animal breeding in India. What the Veterinary Department has done in the past does not suggest that they have the idea of the production or breeding of an animal with certain economic values. I believe the animal-husbandry man knows the kind of animal he wants and he can be trusted to breed it. But when his animals are sick he then needs the veterinarian. The veterinarian has enough to do to prevent disease and to cure it to keep him busy for a long time to come in India.

1. (c)—I would suggest the following for further study and research. In some of them a little is being done, but much more ought to be done and that speedily. More men should be turned loose on these problems so that, as a result of their pooled experience, we might get some definite information and ascertain new and successful methods.

(1) The problem of the necessity and value of tile drainage.

(2) Methods of utilising:—

(a) The man power of the village when not engaged in agriculture.

(b) The use of animal power when not engaged in agricultural operations.

One of the largest contributing causes to India's poverty is the enforced idleness of both man and beast in so much of agricultural India to-day. Both man and animal suffer because they are paid for what they do, and they do not do enough to earn a living wage. In certain parts of India because labour is so cheap, and men are unoccupied or not profitably occupied for so much of the time, there is no demand for a village power unit for grinding grain and cutting fodder and sawing wood and pumping.

(3) Improvement of wells. A great deal of India is beyond the reach of flow irrigation and can only be irrigated by means of wells. We know to-day very little about enlarging the capacity of wells. We have not yet discovered an economical fool-proof pumping unit that is within the financial and mechanical reach of the village farmer. Well water is expensive to raise, and the area commanded by one well is usually small. It is worth the life-time efforts of a number of very good engineers to work out the most economical power units and most economical use of well water and the most profitable crops to grow under well water. There are over 6,000,000 wells in India, a very large majority of which could be of better service than they are if the problems were thoroughly studied.

4. Prevention of erosion. Another subject which requires investigation is the prevention of erosion. The annual loss to India through the washing from the sun-baked land of the loose, dried manure and organic matter and surface soil is perhaps the greatest economic loss from which India suffers. This fertility which India needs frequently goes unhindered to the sea.

5. Contour irrigation. At present most of the irrigation of India is done on levelled land. To terrace land is very frequently so expensive that after the ground has been terraced or levelled no crops can be grown upon it that will pay interest charges on the investment. There is, therefore, needed a number of officers skilled in contour irrigation methods whose work would be to bring millions of acres not now irrigated under command. Along with the prevention of erosion goes the advisability of putting in small bunds or dams which frequently reclaim only a few acres. But these small dams can reclaim an aggregate of millions of acres, and, in some districts of India, would mean all the difference between economic success and economic failure.

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6. Fertilisers. Another problem for investigation is the use of commercial fertilisers for the different soils and climates and the proper use of village waste.

7. Damage from wild animals. Another subject for investigation is the damage caused by wild animals, the causes that underlie much of this, and the remedies, if any, to be applied. I have been looking into the damage caused by wild animals and I am greatly disturbed by what I find. I have discussed this with a number of qualified observers, and they put the average loss of grain crops and fodder crops from 10 to 20 per cent. of the total yield of India. In many parts commercial orcharding is almost impossible, due to the depredations of monkeys, flying foxes, porcupines, jackals, squirrels, rats, wild-pig, deer, wandering cattle, green parrots, wild pigeon, peacock and other grain eating birds. It is not only that these animals between them destroy anywhere from 10 to 20 per cent. of the cultivated crops of India, but for fear of their depredations many farmers do not grow crops which would be more profitable than the crops they do grow. For instance, while India has three-fifths of the world's sugarcane acreage, it grows two-fifths of the world's sugarcane. It imports anywhere from half a million to a million tons of sugar. While the Government sugarcane breeder has produced canes for India the equal of any cane on earth, the spread of these good canes is very slow, because they are not so tough and woody and fibrous as are some of the indigenous canes. They are therefore a greater prey to wild animals. If India grew the best canes, she could not only meet all her own sugar requirements but would have a surplus. In a country predominantly vegetarian, sugar as a source of energy in the diet is relatively of greater importance than in other countries. The *per capita* consumption of sugar in India is only one-fifth that of the United States and Canada.

I have evidence from an estate of 1,300 acres, of which 300 acres are cultivated, that 20 watchers, men and boys, are on the pay roll all the time, employed to drive away the monkeys, of which it is estimated they are over 2,000 on the estate. In spite of the 20 men and boys employed, the monkeys destroy at least 50 per cent. of all the vegetables grown and 20 per cent. of the field crops. Before the monkeys came in there, an orchard was sold for Rs.500 or Rs.600 a year. It now sells for Rs.30. Owing to the religious belief of many of the people of India, it is difficult to discuss this problem without appearing to wound their religious susceptibilities. Greater than any other cause of India's poverty is the doctrine of transmigration or reincarnation. The economic aspect of the doctrine of transmigration needs to be studied, because in the midst of a dense population a belief in it keeps alive a great many animals that enter into direct competition with man for the produce of the soil. The average annual economic loss entailed is much greater than the Imperial Government and Provincial Governments receive from all sources to run the country. Regarding the cattle, regarding the surplus wild animals, an outsider can do little. If there is any improvement it must come from within the fold of Hinduism, and I often wonder what would happen if the Hindu scholars would search their scriptures. Could they not find some way out of the present serious position?

QUESTION 2.—AGRICULTURAL EDUCATION.—I thoroughly believe in some form of agricultural education for the village boy, who, as soon as he is old enough, begins to learn the methods pursued by his father. If every village school were in charge of a properly qualified teacher, better methods, and better seed and the economic use of manure could be introduced. I know a great many educationalists do not believe in agricultural education in the schools. The schools in which agriculture is taught in the Philippine Islands, in the schools of Canada, and the schools in some of the southern states of America have revolutionised rural life. It has been through the village agricultural schools following scientific methods that the adults have

been won to better methods and more profitable systems of farming. The great difficulty with most education given in Indian rural schools is that it has been prepared for the city boy. It is just as easy to teach arithmetic and mensuration by means of figures taken from agricultural life as it is by figures taken from city life. The problem is difficult, but to leave it alone is to confess failure. To quote General Armstrong, the founder of Hampton Institute, I know of "no rural disability for which ignorance is the cure." This being true, it may be that we have not yet devised the right kind of education for the Indian village. The magnitude of the problem, the ignorance and inertness and hopelessness of the mass are frequently used as an argument against village education; whereas these facts are the greatest argument for it.

If to-day there were unlimited funds for rural education in India, little progress could be made because first, there is no definite well-thought out programme of rural education, and secondly, if there were a programme, there are very few teachers who have had the training which would enable them to carry out the programme. So the first need is a programme for rural education suited to rural life, and secondly, a supply of properly trained teachers.

Almost all forms of agricultural education in India suffer because those in charge of it are trying to look both ways. They say they want to turn out a practical farmer, but they insist upon so much science and laboratory work that there is little time for the student to learn how to do things successfully on the farm. The result has been that far too many of those passing through the agricultural colleges of India have become Sub-Deputy Assistants to some officer engaged in laboratory investigation. There is a most important place for laboratory work and study, but we must frankly give to the village farmer training that will enable him to produce larger yields at a smaller cost of production per unit. This can be done.

(i) The supply of teachers for rural schools is not sufficient. There is urgent need for extension of agricultural teaching facilities in the Allahabad District.

(ii) A few years ago the Collector of Allahabad, Mr. S. H. (now Sir Selwyn) Fremantle, provided each one of the 62 village schools with a plot of ground and a well, and sent teachers and deputed village teachers for agricultural training. These teachers then went to the village schools and in some of them very decided progress was made. But there arose Collectors that knew not the ideas or ideals of Sir Selwyn Fremantle, and so the village teachers ceased to function as teachers of agriculture. The school gardens and equipment were destroyed; in some cases the land has been rented to a local farmer, but the land still belongs to the schools and, if there were trained teachers to put in, I believe there is no district in the whole of India better situated for worth-while experiment in rural education than the Allahabad district.

(iii) As far as possible, teachers in rural areas should be drawn from the agricultural classes; but very few of the agricultural classes, that is, actual farmers, are sufficiently educated or have the desire to become teachers. The landlords and other rural non-manual-labour classes usually become the teachers in village schools, and while they live in small villages their ignorance of agricultural matters is frequently profound, many-sided, and almost unbelievable. Many are proud of their ignorance. It is amazing to talk to men who have lived in the village and find out how little they know of what goes on under their noses; truly "having eyes they see not"

(iv) I do not consider the attendance at existing institutions is as numerous as it should be. One reason for this is that agricultural education is new; then there has not been a sufficient number of jobs in Government service; again, agricultural education in a number of instances has been cheapened because qualifications for admission have been easy and

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so have attracted students who could hardly have entered an ordinary arts or science institution. Apart from Government service, there is little demand for trained agriculturists. The large land owners and zamindars for various reasons have not seen fit to employ graduates of agricultural institutions, or if they have employed them have insisted on their following old methods; or they have too much impatience and expect the graduate of the agricultural college to be a miracle worker who can produce results in one season in India that would take years of patient efforts in any other country. Or they have failed to recognise that improved agriculture is an investment, money must be put in, and time must be given to get an adequate return.

If some system of district demonstrators or farm agents or advisers could be introduced in India, or more extensively used than at present, such demonstrators, going to the actual farmer, knowing village conditions, and teaching the farmer on his own farm with the resources that he has, and the means at his disposal, how to produce bigger and better crops more economically, would soon create a demand for more instruction. Much greater use would be made of Government Military Dairy Farms as educational institutions. Apprentices could be taken for training in them.

(v) The main incentive which induces lads to study agriculture is in a majority of cases the hope of a Government job; to work for a large land owner; to actually get their living as farmers on the soil; and lastly, a desire to do good to their country through improved agricultural methods.

(vi) My observation is that a majority of pupils who come to agricultural colleges are not drawn from the actual farm classes but are from the landlord or professional classes.

(vii) The modification in the existing courses of study which appear to be called for are to make them less technical and scientific and more practical. In most cases to-day assent is given to this idea, but in actual practice agricultural students spend much more time in class work and laboratory than they do in the field. Furthermore, the courses should be for not less than four years in the case of an agricultural college leading to a degree. It is impossible in the present intermediate course to turn out a trained farmer. In the village schools every year the student should do some practical work in his plot in the school garden.

(viii) My views upon nature study are that, while it can be a most useful adjunct to a school, it is frequently of very little use.

I believe the individual plot, say, one metre by three metres, where each pupil does his work under the direction of a qualified teacher is a good thing for the village school.

I do not think every village school should have a school farm, but there should be in every district a centralised school with a farm to which the best of the boys should go at the age of about 14 and stay until they are ready to enter college or go to work to earn their living. These school farms, if they were used as educative factors, would not be likely to be financially self-supporting.

(ix) I append a brief account of the students who have undertaken a two or four year course of agriculture since 1912 in the Allahabad Agricultural Institute. You will see that a majority of the men are engaged in something connected with the teaching or carrying on of agricultural operations.*

(x) (1) By having a good school well equipped and well staffed, with a normal social life which includes games and literary societies. These men should be so trained that they can go out and manage land and farm for profit, or go out as farm demonstrators or agricultural advisers. Few men are fit for this who are not able to make a success of farming. Rural education in rural tracts can be popularised if it can be proved that it pays financially.

* Vide Appendix I.

My experience is that many farmers know much better than they do. They do not do their best because of the illegal exactions by either the landlord or his agents or by the petty officials or their families. Rural education can be improved and popularised if it can be shown that the actual farmer will reap a fair share of the return to his labour and be secure in his holding. I have known farmers grow Pusa wheat for one year only, or better sugarcane or better cotton, and refuse it the next year because they said that those in whose control they were, reaped all the reward, and they were left with only enough to keep body and soul together.

(2) Back of and beyond all other problems of rural India is the problem of giving security and certainty to the village farmer. No legislation, no orders-in-council are of much use in this connection unless there is the heartiest co-operation and mutual trust between the Indian landlord, the Indian moneylender and the Indian official who comes into direct contact with the farmer in the village. They need to learn that their interests are common and not mutually exclusive. The increase in production, if all worked together, would give each a large share and thus each would be better off.

(xi) I suggest for better educational facilities in rural areas that every rural school have its garden plots in which a majority of the pupils can have their own individual plots. This school plot to be in charge of a trained agricultural teacher and this school to be supervised by a trained agricultural Supervisor and be inspected by an Inspector with a knowledge and appreciation of agricultural conditions. The present financial allotment is insufficient for this kind of education.

(xiii) There would have to be increased taxation or at least a local cess to provide money. But after this system had got going it would prove itself to the country side, and they would gladly support it. The difficulty is to start.

So far, I have written under the head of agricultural education and taken it to be synonymous with rural education, but I have thought only in terms of boys and men and of improving their lot. Reflection shows, and experience in India demonstrates that, as long as the education meets only the needs of half the population, that the whole population is held back by the ignorance of the half that fails to be educated. While the problems concerning boys' and men's education in rural India are staggering and bewildering, the problems of the right education for the girls and women of rural India are much greater and much more difficult of solution than for the boys and men. I believe that in connection with every agricultural college and centralised school there should be a women's department with women teachers who would teach domestic science which would, of course, begin with the home, its betterment, the care of children, the proper preparation of foods, the sanitation of the home. Quarters where married students could bring their wives are necessary. As long as the girls and women of rural India are satisfied with the homes in which they now live there is little hope for any improvement in rural India. But if these girls and women were trained they would make greater demands on their husbands and fathers and brothers for a higher standard of living in the home. The trained girls and women would provide the incentive, and also would be the spur to urge on the men to increase production and increase profits. So that, unless the Royal Commission on Agriculture takes thought concerning the home of the farmer and suggests means for its betterment, its work will fail to get the largest results.

The education of the village girl and woman is fundamental in any scheme of rural betterment for India. It is only by educating women and girls that the standard of living can be raised.

QUESTION 3.—ADMINISTRATION AND PROPAGANDA.—I believe, regarding administration and propaganda, that the Rockefeller Foundation Education

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Report for 1914 shows the way to get into touch with the cultivator. A Country Agent or trained farm adviser going to the farmer where the farmer lives, gets him on his own land and by his own efforts to carry out suggestions, is the most effective way to spread the knowledge of better agriculture to adults. Frequently in India the wishes of Government have been defeated through having men in actual contact with the villager who have had more concern for their own immediate financial success than they had had for spreading the better seed or better methods which the Government is anxious to propagate. We have in the co-operative movement, not only for co-operative credit but also for co-operative buying of tools and fertilisers, the co-operative storing of fodder and grains and marketing of farm products, the greatest hand-maid to agricultural betterment known to men. But it must be worked with honesty and intelligence and business sense.

QUESTION 4.—ADMINISTRATION.—(c) (i) The Agricultural and Veterinary Services. I am not satisfied with these services, because I am repeatedly written to by people who want advice on the growing of certain crops, or the control of certain pests, or regarding the suitability of a given locality for the production of a certain crop, and when I have referred these people to the local agricultural authorities, the writers frequently have told me that they got unsatisfactory answers. The Agricultural Department is not wholly to blame for this; the men in it are already so loaded that it is physically impossible for them to attend to the calls made upon them for advice. The agricultural literature costs too much. The price should be nominal, or be given free upon request.

There should be an Extension Officer in connection with every agricultural department, and under him should be a properly qualified adviser in each of the different branches who could not only send a printed statement regarding the crop of plant, pest or disease in question, but could either himself visit, or depute some qualified officer, to go to the place and see and advise on the spot whenever it is necessary.

(ii) The railroads of India are of the greatest importance to agriculture. They are now covering most of the country with main lines. I have not recently had experience of the railroads, but some few years ago I had a good deal, indirectly, and found that it was almost impossible to get wagons for the despatch of goods in time, and then only upon the payment by the prospective shipper of an illegal gratification to the station staff. This greatly interferes with the mobility of the crops and adds greatly to their cost of production. The pilfering on the railway and the failure to secure compensation also add greatly to the worries and anxieties of the shipper. It was almost impossible to send some consignments of fruits and *ghi* and certain agricultural products without having the parcels opened. I have also watched in stations railway servants handling consignments of fruits and vegetables so roughly as to break open the containers. The containers were so constructed as to satisfy any ordinary demands, but they were purposely flung about so as to burst them open, and the railway servants then helped themselves as to what fell out.

The carriage of cattle is very expensive and unsatisfactory. There is no provision for shipping one animal. One frequently wants to get a bull, but the freight charges make it impossible, and thus retard the improvement of cattle in India. Loading stations are improperly equipped. In the grain exporting districts oftentimes the goods warehouses and platforms are insufficient in number and size, so that frequently grain has to be stored on the open platform at owners' risk. If rained upon, there is the germination of seed and consequent loss. I believe there should be special cheap rates on the railroads for the transport of commercial fertilisers. These, properly used, would lead to a great increase in a crop yield with consequent increase of railroad transport of the crop. Why should it cost twice as much to ship a goat in a dog-box as a dog in the same dog-box in guard's van?

(iii) *Roads*.—There are few subjects of greater importance to the farmer in India than the increase in number and improvement of roads. Some of the potentially richest agricultural districts of India are the poorest economically because of the lack of roads. In a good many places it is only during the dry season that carts can be used. During the rains the only way to transport is by head-load. There is a limit to the economic distance that a head-load can be transported. I believe that the Government of India ought to enter upon a programme to provide a system of *pucca* roads as feeders to the railroads and have motor transport as feeders to the railroads. A system of good *pucca* roads with proper bridges would make it easy for any rural community to sell its products when the market was most favourable. To-day it often is compelled to sell its products only when the roads are open if there are any roads. I know of a good many villages within reach of Allahabad markets where, because there are no roads, the cost of transporting by head-load or pack-animals is so great compared to that of ox-carts that the villagers, instead of reaping the reward of the fertility of the soil, are very poorly off. Market price pays no premium on head-loads or makes allowance for expensiveness of transport. This is always borne by the grower.

(iv) *Meteorological Department*.—I believe the Meteorological Department of India can be of much greater service than it is at present. To-day it might be of great use to the Indian farmer. I do not know upon what basis its present reports are given out or how they are designed. I am given to understand that temperatures are taken 10 feet above the ground, and so Allahabad officially has never had a killing frost. Its lowest official temperature is 40° F. (December 25th, 26th, 27th and 28th, 1926, had killing frosts on our farm.) My tomatoes and *arhar* and *chana* and other crops that are killed by frosts do not grow 10 feet above the ground and know nothing of the official temperature. They are grown upon the ground, where every second or third year we have a frost which does very material damage. The Meteorological Department is in a position (possessing information which it could give to me and other farmers sufficiently far in advance) to advise so that we could take measures to prevent the frost doing us serious damage. Upon the warning from the Meteorological Department that a killing frost was imminent we could irrigate or light smudge fires or get large wind-sails with a suction fan at the bottom and pull down the warmer air from the upper layers to mix with the cold air in the orchards or gardens. Further, no sun temperatures are given, but most crops grow out in direct sunlight.

Again, the yield of so many crops in a district depends upon the amount of rainfall during a given period of time; crop forecasts by the Meteorological Department are often more reliable and correct than those of the Agricultural Department, which bases its reports upon the acreage sown, whereas the Meteorological Department gives the climatic conditions during the critical periods of growth. By using a series of coloured signal flags at railway stations, country post offices and telegraph offices, at police outposts, a system of warnings could be offered to the agriculturist which would be of great economic value to him. The worst killing frost of modern times in the United Provinces occurred during the first week of February, 1906 or 1907. Field crops were far enough along in flower or bud or fruit to be ruined by the frost. Had the Meteorological Department had its system working and the people conversant with it, a saving could have been effected that would have kept the Meteorological Department going for many a decade. I lay great importance, therefore, upon the improvement of the meteorological service to the farmers of India.

At present we do not get weather "forecasts." When we get weather forecasts, usually we have already experienced the weather the official forecasts tell about through the press.

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(v) and (vi) *Post and Telegraphs*.—India is admirably suited to what is known in Canada and the United States as the "Night Letter System." According to this, a letter of 50 words handed in to any telegraph office between 6 o'clock at night and midnight will be sent by wire and mailed the next morning in the first mail delivered. This 50-word night-letter goes for the price of an ordinary day telegram. The distances in India are such that if the system were in vogue merchants in Bombay and Calcutta could interchange ideas very much more quickly than they can by using the ordinary post. Furthermore, this keeps telegraphs working at a time when otherwise they would be little used and reduces overhead charges. It makes a great deal of work for telegraph operators, and has been proved a great boon to the public and a source of increased profit to the companies that own the telegraphs. Furthermore, wherever a person receiving a telegraphic message is a telephone subscriber, there is such close co-operation between telephone and telegraph departments that the telegraphic message is immediately telephoned out to the telephone subscriber, and is later on sent by mail from the telegraph office. This saves time in getting the message to the recipient, and also saves on messengers when a telephone call is cheaper than a messenger.

QUESTION 5.—FINANCE.—My view concerning the steps to be taken for the better financing for agricultural operations is to prove to the three parties concerned, namely: Government, the landlord and the cultivator, that in the long run and over a period of years their interests are identical rather than mutually antagonistic, and to convince all of them that the improvement of agriculture is an investment. This calls for the education of the three classes concerned. The quickest way to secure adequate finance is to first improve the lot of the farmer. If he is prosperous and has money to spend, landlord and Government will get a share, but if the farmer has little or nothing there is not much for the other partners.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—In my opinion the main causes of borrowing are: bad seasons, fall in prices of agricultural produce, illness which prevents the proper preparation of the seed bed or harvesting at the right time, social functions like weddings, oppression and illegal exaction by money-lender, landlord and petty officials. Few farmers keep accounts of the various operations performed, so that they have no correct information as to whether the thing that they are doing gives an adequate return or no. A great many of the operations performed, like the feeding of inefficient cattle or the growing of crops that do not pay, is really a consumption of their capital, but because they keep no accounts they cannot tell where their loss is.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—Mr. Calvert and those with him in the Punjab have done the most successful work in India in reducing the loss in agricultural efficiency due to fragmentation of holdings. I believe that sufficient has been learned in the Punjab about this that legislation could well be enacted to enable a majority in any given district who desired to consolidate their holdings. There would need be adequate safeguards, and those in charge of carrying out the reallocation would need be very sympathetic and full of knowledge. The legalist and martinet type of officer would not do for this job, but a man of insight and understanding is called for.

QUESTION 8.—IRRIGATION.—(a) I have travelled over a considerable part of Central India, Central Provinces and Rajputana, as well as the United Provinces, the Punjab, Kashmir and Bengal. Central India and Central Provinces, with their long narrow valleys, through a series of dams, lend themselves to successful water storage. A great many of the irrigation schemes that could be put in would be "protective" rather than "productive." The late Maharaja of Gwalior did a great deal in the way of

irrigation through the advice of Sir Sidney Preston. A great many tracts that are now very precarious and uncertain could be very profitably protected. I do not believe that sufficient importance has been paid to the possibility of a great many small irrigation units in the form of a dam that collects water from only a small catchment area. There is great scope for the introduction of small irrigation schemes, many of which could also provide a limited amount of electrical power. There are also possibilities for much larger schemes which have not been brought into effect because the power and storage site might be in one territory and the land to be benefited in another. Some form of co-operation should be worked out so that these things could be made profitable to all concerned. I have already mentioned wells in my note under research.

(b) I am not satisfied with the existing method of distributing canal water to cultivators. I believe that all water should be distributed by measure. This would induce the cultivator to use more economical means, and thus would greatly increase the duty of irrigation water. In a great many places where the water is given at stated intervals without measure, the ground to be irrigated is flooded; frequently to the detriment to the yield and certainly with great wastage of water. Furrow irrigation with inter-culture is more economical than the flooding method. It is customary to have very small plots of land which are flooded. The water is rushed on in a short time and then left. This takes a great deal of labour and great loss of water by evaporation. Long furrows up to 500 feet in length with a small amount of water trickling down eight or ten furrows at a time, rather than the same amount of water rushed down in one furrow, will greatly increase the duty of water. After irrigation, as soon as the furrow is sufficiently dry to cultivate, a single bullock cultivator will then conserve the moisture. In this way 20 per cent. to 50 per cent. of the water and 10 per cent. to 25 per cent. of the labour will give a better crop than where flooding is practised.

QUESTION 9.—SOILS.—Research work upon the soils of India has been done in limited measure. We have a very great variety of soils and very seldom do two different types respond in the same way to similar treatment. Soil study is one of the fundamental problems to be dealt with. This is a sphere where Pusa and the Provincial departments should have a strong staff working in co-operation. These soil specialists would study trenching, reclamation of *usar* lands and the prevention of erosion.

(ii) I know of very marked improvement of the land of the Agricultural Institute. When we took it over in 1912, all except a little on the river bank was very badly infested with *kans* and *kus* grass, some of it had not been ploughed within the memory of man. It was very badly eroded with deep gullies. The first thing we did was to put dams at certain strategic points so that whatever silt-laden water came down was immediately deadened in its flow. The carrying power of water varies, as to the sixth power of its velocity, so that any reduction in velocity must cause very considerable deposit. In three years in one place there was a deposit of alluvium 10 to 14 feet deep. One dam cost Rs.1000—the area reclaimed is about 50 acres. This land which formerly could not be rented at more than four annas a bigha or six annas an acre is now producing crops 25 to 30 maunds of Pusa wheat per acre. It grows crops of sorghum fodder running about 17 to 18 feet high and yield 20 to 25 tons of green fodder per acre. Where this land is not actually submerged two crops can be grown in one year without irrigation. Our village neighbours have estimated that every year on the land reclaimed by this dam, that formerly produced very little of economic value, there is now produced grain in value five to ten times the cost of the dam. The stalks and straw they do not count. But they say these as fodder more than pay the cost of production of the grain. A number of villagers have come and asked us to help

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them to put in similar dams saying that those benefited will pay in proportion to the land reclaimed. Only the financial stringency and inadequacy of our staff have prevented us from taking advantage of these invitations to co-operate with our neighbours. I know of large tracts that have suffered severe deterioration because no dam has been put in, and all the trees and shrubs and grass have been taken away so that erosion has gone on without let or hindrance.

QUESTION 10.—FERTILIZERS.—Much greater use could be made of natural fertilizers than is now done. Common cattle manure will yield a much greater profit when put on the soil and ploughed in than when turned into cakes and burnt as fuel. In and about Allahabad the custom is for a contractor to pay the *gowala* anywhere from one rupee to two rupees per month per animal for the right to take the manure and turn it into cakes for fuel. The urine is almost invariably wholly wasted, that is where there is no bedding used to soak it up and then send it to the field as manure. If the animals stand on dirt floor the dirt is not taken out and used as manure and replaced by fresh dirt. A cow or a buffalo in full milk weighing from 900 to 1500 lbs. will make from 60 to 100 lbs. of manure per day. Seventy-five per cent. of the chemicals in the food will appear in the manure, that is, the chemical ingredients which are usually bought as commercial fertilisers, nitrogen, potash and phosphorus, if these are returned to the soil there will be great increase in fertility, to say nothing of the organic matter which is so valuable for improving the soil, increasing its friability and water-holding capacity. The manure the *gowala* sells for Rs.1 to Rs.2 on chemical analysis is worth anywhere from Rs.5 to Rs.8 per month, and would pay a farmer to put it on land at that price. There is a great waste of other animal manures due to caste and various religious and social prejudices. In the matter of the utilisation of the home-made manures, India is the most extravagant country on the face of the earth. This is one reason why she is one of the poorest. The failure to utilise the bone, most of which is exported, the burning of the of the cowdung, the unwillingness to use other animal manures, unless on the part of low caste people, because higher caste people could not touch it, causes a loss of fertility that is very great. India wastes what could make it rich if properly used, and what does make other countries, much less favourably situated agriculturally rich. On the Agricultural Institute land we follow the system of trenching where all manure, stable-litter, weeds that the cattle will not eat, waste paper and all organic matter of any kind are trenched. I append a bulletin showing the system followed. After twenty years I am convinced that for the conditions round about Allahabad this is the most economical use of manure. When I speak to the Indian villager about using his cattle manure as fuel, he says it is bad but he has no other fuel. If the people of India were not so prone to destroy, ruthlessly, young trees that have been planted out, there is enough waste land or land along paths or road-sides where quick growing trees could be planted so that almost every village could have an abundant supply of wood for fuel. This is where co-operation has a chance to prove its value. Again, if the village farmer would put his cowdung on the land he would increase the crop. He could sell the surplus and with the proceeds therefrom buy himself a good blanket or quilt or bedding. He would not need so much fuel to keep warm. The poor village people of India keep themselves warm through the cold weather, not through having an adequate supply of clothing, but through burning cowdung, leaves, twigs and grass and stubble, all of which would return much more if put into the soil.

Then too, large districts of India can be taught to use coal as fuel if there could be on the market a cheap, economical, coal-burning stove or grate adapted to the Indian village and not to the European kitchen.

QUESTION 15.—VETERINARY.—I believe the Civil Veterinary Department should be separate. It should care for sick animals, should seek to prevent disease among animals and should strive to educate the village farmer as to when a veterinarian is necessary. The Civil Veterinary Department, however, should not be engaged in the commercial breeding of animals. This, I think, can be best done by trained breeders, whether it be of cattle or horses or sheep or chickens. The professional breeder has an ideal type in mind that he is breeding towards. It is not the Veterinary Departments outside of India that have given us the best animals. It is the trained and skilled breeder who has had a definite object in view. The viewpoint of the veterinarian is usually to get an animal largely immune to disease, that can fend for itself. Whereas by the very process of domestication of animals there are developed in them those factors that best serve mankind, and, in so doing rob them of much that they had to protect themselves within a state of nature.

QUESTION 16.—ANIMAL HUSBANDRY.—Dairy Problem. The cattle problem of India is extremely complex. On the one side you get men saying that the present high prices of cattle and dairy products are due to an insufficient number of cattle in India; that the slaughter of cattle and the export of cattle impoverishes India. On the other side, you get those who say that India has far too many cattle, either for the food supplies, or the economic needs of the country. The importance of this question to India is so great that Government would be wise to put on a strong committee to tour the country and learn the facts at first hand. This committee should have representatives of all shades of opinion, and its instructions might include the study of the economic aspects of the cattle problem. The fact that the cow is held in veneration by a large majority of the people of India makes it extremely difficult to study this question on its merits. Frequently, one is accused of deliberately wounding the religious susceptibilities when discussing the cattle problem in its economic relationship. It ought to be made clear that there is no desire on the part of anyone to wound anybody's feelings with regard to his religious beliefs.

I saw some figures not long ago written by a man who was comparing the number of cattle in India with other countries in *The Indian Social Reformer* of 12th June, 1926 (page 640). The figures given are the number of cattle per 100 of population:

In India	...	...	...	...	...	...	...	...	59
Denmark	...	...	...	...	...	...	...	...	74
In the United States	...	...	...	...	...	...	...	...	79
In Canada	...	...	...	...	...	...	...	...	80
In Cape Colony	...	...	...	...	...	...	...	...	120
In New Zealand	...	...	...	...	...	...	...	...	150
In Austria	...	...	...	...	...	...	...	...	259
In the Argentine Republic	...	...	...	...	...	...	...	...	323
In Uruguay	...	...	...	...	...	...	...	...	500

Assuming these figures are correct, without analysis they are apt to be misleading. In the first place, in most of the countries outside of India the cattle are divided into two classes, milk cattle and beef cattle. In the case of the dairy breeds almost all the females that have good conformation and good constitution are kept, but any that are faulty are ruthlessly destroyed. In the case of the males, only the bull calves from the best cows are kept alive for breeding purposes; the rest are used for human food as veal. In the case of Denmark and New Zealand, which are pre-eminently countries that have gone in strongly for dairying, and they are therefore very prosperous countries, a good dairy cow produces more profit per year on the average than any other bovine form. They strive to increase the production of milk and butter per individual cow rather than increase the number of

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cattle. It costs less to produce 10,000 lbs. of milk from one cow than to produce 10,000 lbs. of milk from five cows. High producing cows produce cheap milk. Low producing cows produce dear milk. That is why milk is so dear in India. In the west of the United States, in most of Canada, in Cape Colony, in the Argentine and Uruguay, the greater emphasis is on the beef breeds where cattle are bred, especially for the meat they will produce. The recent phenomenal prosperity of the Argentine and Uruguay are due to the fact that their exports of greatest value are ship loads of chilled beef sent to Europe. Also breeders from these countries go to the British cattle sales and pay thousands of pounds per head for the best bulls of the beef breeds to improve the beef in their own countries. It would be found upon analysis that a large majority of the cattle in the beef countries are under two years of age. The only ones over that age are the breeding cows and bulls. The fashion for beef to-day in beef-eating countries is for well-fed beef animals from 10 to 18 months of age. They call it "baby beef." It is much more profitable for the breeder than to keep cattle for three or four years. An analysis of the figures for the cattle of India would reveal the fact that a very large number of cattle, I should say from 10 to 15 per cent. of the cattle population of India, consists of old cows and bullocks too old to work or breed, barren heifers and cows, and deformed and useless animals for either milk or draft. In any other country except India these animals would not be allowed to live. They consume the food needed by the working animals. From my experience with cattle in India it would be a kindness to kill a great many of the extremely old and deformed cattle. They are often turned out by their owners who will not kill them to become the prey of wild animals. This is an exquisite form of cruelty. They are not properly fed and they generally die of semi-starvation after lingering to misery. A quick death will cause much less suffering, and as they are going to die anyhow, it is better to end their misery. The unwillingness to take animal life does not mean that animals in India are treated with more kindness than they are in other countries. One of the appalling things in India is the callous indifference to animal suffering. I spent a week in Bombay from the 9th to the 16th of October, 1926. I observed very carefully the oxen passing to and from the docks pulling the loads. By actual account over 97 per cent. of the oxen that came under my observation had their tails disjointed from being twisted by their drivers. It is not that the tail is disjointed and then the joints are replaced, but the tail is then left disjointed. In most cases the animals' tails were disjointed in several places. Anyone who has caught a cricket ball wrong and disjointed his little finger knows how painful that can be, even after it has been put back into its place. Again, I noticed animals being goaded most cruelly, beaten with big sticks, forced to work with gall sores under the yoke. I know of no country where cattle are so badly treated as they are in India. Very frequently the professional *gowala* who takes his cow and milks it as he goes from house to house does not allow the calf to get enough milk to grow. A poor under-fed, stunted animal results. While it is true that whole milk is far too expensive to feed the calves in India, it is also true that after the first two weeks the calves can be fed on skim milk and milk substitutes, so that the calf can be well fed, well nourished, and make a normal, healthy growth for much less cost than when whole milk is used.

Again, in most of these countries the ox is not needed as a draft animal, horses are used, whereas in India a large majority of the males are used for draft purposes. In the countries outside of India where cattle are used for draft purposes cows are used for ploughing as well as oxen. Twice I have crossed continental Europe by daylight and have noticed a very large number of mature cows with big udders that were engaged in pulling the ploughs. From the standpoint of milk production, this is very bad.

While the cattle of India measured by European standards are not economical or of first rate quality, with few exceptions, they are without question

the best tropical cattle in the world, and for this reason are very valuable for crossing purposes with cattle from Northern regions that are expected to live in some tropical or sub-tropical regions. The immunity to disease, the ability to stand a hot climate, the very high digestive efficiency of Indian cattle are all factors of very great importance and value. There are breeders in the United States who would gladly give several thousand rupees each for well selected, well grown bulls of the best and largest breeds of India, but clamour has restricted the export of these animals in most cases. I believe that a good export market for India's cattle would be one of the very best incentives to improve India's cattle. If a breeder knew that at two years of age his best bull calf might realise Rs.5,000 for export, and that if he got a better bred one the price would go even higher, he would be induced to improve his cattle very much. One of the greatest drawbacks to the improvement of the cattle of India is that there is so little incentive in the way of a reasonable price to induce the breeder to improve his cattle. So that a carefully controlled export trade of cattle would be a great incentive to produce better cattle in India. In the *Breeders' Gazette* for 18th November, 1926, we are told of some $\frac{3}{4}$ Shorthorn and $\frac{1}{4}$ Indian cross-bred steers in Texas that average about 1,000 pounds each live weight at one year of age, and sold (25 head) for an average of Rs.315 each. The correspondent declared them "to be the most distinctive load of fat cattle in America."

My observation leads me to believe that there are far too many cattle in India to-day for the work needs of the country and for the cattle food supplies. After careful study, for a number of years, of the facts relating to cattle, I have come to the conclusion that India suffers an annual economic loss due to the surplus and inefficient cattle of over two crores of rupees (Rs.2,00,00,000). At least 90 per cent. of the cows do not produce enough milk and offspring, manure, bones and hide to pay for their food, stabling and care. About 80 per cent. of the oxen do not give a return in work and manure and hide and bones enough to cover their cost of production and maintenance. One goes to the fairs in most parts of India and prices the three-year-old ox, just ready to be broken into work, and then makes a rough estimate of the cost of production of these bullocks. He will be struck with the fact that the breeder must have exceedingly cheap fodder and milk to rear them on, and must not put a high value on the labour of those who care for them. Three-year-old oxen sell from Rs.40 to 75 each, even where there is abundant grazing, and milk sells at 20 lbs. to the rupee. This would prove upon strict accounting to have involved the breeder in a loss of money. Again, there are very few parts of India where a cow would pay if she gave less than 2,000 lbs. of milk per year. My observation leads me to believe that 90 per cent. of the cows of India give less than 1,000 lbs. of milk in a year. There are half a dozen so-called dairy breeds of cattle in India: the Sahiwal, the Khanawal, the Montgomery, the Sindhi, the Kosi, the Haryana and the Hissar, &c. In certain cases some of these herds have been kept fairly pure by the Government Military Dairy authorities. Inferior animals have been weeded out for a number of years. The latest I heard was that there was no pure bred herd of Indian cattle consisting of 50 animals and over that averaged 3,000 lbs. of milk per mature cow per year. As far as my observation goes less than 25 per cent. of the cows of the best dairy breeds of India give over 2,000 lbs. of milk. This 25 per cent. may be on an economical paying basis, but the 75 per cent. involve an annual economic loss.

While it is undoubtedly true that it is very difficult to introduce foreign cattle into India, it is the only way up to the present in which milk can be secured in large quantities at a reasonable price. The crosses that have been tried are usually imported bulls for sire and Indian cows for dams. The milking Shorthorn especially from Australia, the Ayrshire, the Holstein-Friesian, the Jersey, the Guernsey, the Brown Swiss, have been used. Where good pure-bred Indian cows have been used, the half-bred daughters give anywhere from two to six times as much milk as their Indian dams,

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or from six to fifteen thousand pounds of milk per year. In most cases it looks as though we could not go beyond half-bred. The three-quarter bred, i.e., three-quarter foreign blood, one-quarter Indian, usually lacks constitution and stamina, ability to stand the climate, is little immune to disease. The half-bred, on the other hand, seems to inherit the milk faculty from the sire, and from the dam the immunity to disease, the ability to stand the climate, and a higher digestive efficiency. One very urgent problem, therefore, is to establish new breeds of cattle from the half-breds. This will be difficult and slow and expensive. The only alternative is to build up the purely Indian breeds. Where the best of the Indian breeds have been well looked after, carefully bred and every inferior animal culled out, the process has been so slow that in the long run it looks as though the building up of the indigenous breeds would be more expensive than the establishment of the new breeds from the half-breds.

There is at least one very important and significant exception to the rule that the three-quarter bred and beyond is of little value for milk. This exception is the Holstein-Friesian cross. From records now existing in the Government Military Dairies it looks as though the Holstein three-quarter and seven-eighth and even a higher percentage of imported blood continued to increase the milk capacity. Cows in the Lucknow Military Dairy with Holstein sires have given as high as 15,000 lbs. of milk per year. The Holstein is one of the biggest boned, largest framed animals in existence. So that when this is mated to cows of the large Indian breeds like the Hissar, Nagore and Nellore, the female is an excellent milking animal, while the male makes a very powerful, courageous, draft animal. This is the ideal dual purpose for India where the females give large quantities of milk, and the males are valuable as draft animals. Of the so-called Indian dairy breeds to-day, with one or two exceptions, the males are not worth feeding for draft purposes. They cost Rs.200 to Rs.300 to bring them to the three years of age, and sell for Rs.75 to Rs.150. Most of the half-bred bulls with foreign blood are no good for transmitting milking capacity, but the bull with Holstein-Friesian blood seems to transmit milking capacity, so these bulls can be used for grading up Indian cows. Few people in India understand that one cow giving 10,000 lbs. of milk per year gives more profit than 50 cows giving 1,500 or 2,000 lbs. of milk per year, to say nothing of the smaller outlay for barns, pasture, labour, &c., and if the bullock from such a cow weighs 15 hundred pounds or more it is worth from Rs.250 to Rs.350 at three years of age, whereas a bullock weighing 600 lbs. to 1,000 lbs. is worth from Rs.40 to Rs.100, and does not pay to rear. So my suggestion for improving the breeds of live stock in India would be to continue the policy of the Government Military Dairies and the Imperial Dairy Expert in collecting and carefully maintaining herds of the best Indian breeds, and by a process of selection and rejection of all below a certain standard gradually build up profitable herds of indigenous cattle. This should be a field where the large landowner could serve his country.

Secondly, what I believe will be more economical and much quicker in the long run is to take some of the best of the indigenous cows, mate them with carefully selected imported bulls of dairy breeds. From the half-breds, establish new breeds, and continue to experiment with a number of combinations to see what is the most economical for the production of milk and draft animals for the different parts of India. Use foreign bulls to grade up dairy herds.

One very practical way of improving the cattle of India would be to breed only from the best; to prevent the maimed, the halt, the undersized and the unfit from breeding. Allow them to live to a good old age if need be, but breed only from the best. In a few years most of the unfit would have disappeared, and the whole standard of the quality of Indian cattle raised without doing any violence to religious sentiments.

So far I have omitted all reference to the buffalo. The buffalo has distinct possibilities. At present good Mohrir buffaloes and Gujarati buffaloes produce more and richer milk than cows. Buffalo milk varies from $7\frac{1}{2}$ to 9 per cent. of butter fat. The Government Military Dairies have a number of animals giving from six to eight thousand pounds of milk per year. This makes the buffalo cow distinctly profitable. The difficulty is, however, that the buffalo is a very heavy feeder, and does not always produce milk and butter fat as cheaply per pound as the best cow will produce milk and butter fat. In addition, the milking strain buffalo male is not nearly so valuable for draft purposes as the bullock. The natural habit of the buffalo is to feed at night and to lie in water in cool shady places in the day. Where buffalo bullocks are used for draft purposes they are not so nearly so efficient as the cow bullocks and frequently cannot stand the heat. An ox can thrive and work in the hot weather where a buffalo will drop dead. It might be possible to breed a strain of buffaloes where the males would be able to stand the Indian climate. But for the present I believe there is more hope of getting a good milk cow to produce a good working bullock than there is to develop a buffalo that will produce a male able to stand the work that a bullock can stand.

(a) (ii) *Betterment of the dairy industry in India.*—According to the report of trained observers it is exceedingly difficult in any Indian city or small town to buy either pure milk or pure butter or pure *ghi*. Milk is most frequently adulterated with water. If it were clean water it would not be so bad, but it is very frequently adulterated with water from the village tank, which is little better than raw sewage. The butter sometimes contains as high as 50 per cent. of curd, skim milk, salt and either vegetable or animal fat. *Ghi* is adulterated with a great many different oils and fats. In an Indian Court not long ago a Mohammedan Judge had to dismiss a case where it was proved that *ghi* had been adulterated with pig's fat, as the prosecution had not proved that pig's fat was harmful for human consumption. In like manner it has been proved that *ghi* has been adulterated with cows' fat, but no conviction was possible. One thing that India needs is pure food laws: but more than the laws is needed a willingness on the part of the people to recognise that good milk and butter and *ghi* cost more money to produce than adulterated, inferior milk products. There is a traditional market price in most parts of India for milk and butter and *ghi*, and while the real price of these things has increased, the price charged to the public has not increased in like proportion. The dealer in these articles has made up the difference by selling adulterated articles. In some cases, milk and its products are treated with such heavy doses of preservatives that the material will keep indefinitely and might be used as souvenirs. The effect upon the infant human stomach can be imagined. At present few people in India are willing to pay the price for pure, fresh, unadulterated dairy products, and until India is willing to do this there is little chance of betterment of the dairying industries. The honest dairyman is greatly handicapped by the competition of the dishonest dairyman.

In certain parts of India where there are very large grazing areas enormous herds of buffaloes and cows are kept. These animals pay very little for grazing rights though the grass often grows on good rich land which would pay well to cultivate. If the cultivators go on to these ranges and try to farm they are likely to suffer at the hands of the professional herdsmen, who break down the fences, drive their cattle on to the growing crops, and carry on such a determined warfare that usually the cultivator gives up in despair. So these cattle do not have to give as much milk in order to pay as where animals are kept in the ordinary way. These wandering tribes take out *ghi* in a very unsanitary fashion and waste all the skim milk and the curd. In some of these tribes, during the course of a season, enough skim milk is thrown away, which if it had been saved and turned into powdered milk or casein would have enabled the tribe

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to settle down and build a village and educate its children and really live better than it is doing at present with its wasteful and extravagant methods. I believe that the instruction of these tribesmen as to the value of a milk factory is well worth the attention of Government. The jackals that follow these tribes are usually very fat and well favoured.

(b) (i) Regarding the over stocking of common pasture in most parts of India, this causes the rapid deterioration of the quality of the cattle. Overstocked pasture grows much less grass than where it is properly treated. Much of the barren waste one sees from the train is overstocked pasture that will take years to reclaim and can only be reclaimed by cultivation with rotation of crops. In general, pasture in India does not pay. In most parts of India cattle are so numerous that for most of the time they seem to be wandering hungry over a desert. It is only during the latter part of the rains and for a month or two after the rains that cattle that depend upon grazing have enough food to eat. Over a great part of Northern India and the Central Provinces and Central India, the cattle put on weight just after the rains, and are reduced to skin and bone before the next rains come round. This annual recurring process of abundant food and then semi-starvation might not be too serious for mature cattle, but the young stock, the calf (e.g., which has been weaned as the famine period comes along) do not get sufficient food to make decent growth. No matter what happens afterwards to a calf that has had insufficient food during the first nine months of its life, it will never make up what it has lost. It will remain stunted and inferior. Because the common pastures carry far too much stock they do not grow as much grass as if they had a reasonable number of cattle and were allowed periods of rest. The great difficulty with the common pastures is that the cattle are on them 365 days of the year; this does not give the young grass a fair chance. It is nibbled off before it has produced a reasonable weight. It can be proved that the best way to produce abundant food for cattle is to greatly reduce the grazing areas on culturable land, grow fodder crops like sorghum, maize, *bajra*, or during the cold weather wheat, barley, oats, peas, *chana*, &c., where the grain is shared by men and cattle, but the cattle get all the stalks. Again, a great many of the weeds and grasses and thorn bushes that cattle will not eat in the ordinary way can be turned into good succulent fodder if put into an ordinary earth pit silo.

The ordinary common village pasture, for nine months as barren as a gravel parade ground, is the greatest single enemy in the way of cattle selection and improvement. There are usually a number of bulls totally unfit for breeding running with the herd. So that India seems to be progressively breeding from the worst. Also for spreading disease there is nothing more effective than the common pasture.

A few general observations on the situation in India.

Far too large a proportion of the population of India is engaged on the land. At least thirty per cent. of this population must be diverted to industry, commerce and transportation if agriculture is to be profitable in India. To-day less than 30 per cent. of the population of the United States is engaged upon the land; 70 per cent. in other pursuits. This is possible because of the large increase in agricultural machinery. Improved machinery, and a lot of it, widespread in use is fundamental to prosperity in India. For the most part the crudest farm implements are still in use. These give the farmer very little average. He is little better off than a man working with his bare hands. An American or British farmer would not make any better showing than the Indian farmer if he had to work bare-handed or with as little as the Indian has to do with.

Agricultural machinery frees the farmer's life from its severest toil and its most debasing drudgery. It multiplies his productive capacity and therefore his wages and profits.

Agricultural produce is in world markets and the competition is very keen. Due to lack of machinery, superstition, ignorance, dishonesty, oppression, comparatively poor transportation facilities, poor farming methods, bad seed, the Indian cultivator is at a serious disadvantage compared with the farmers that are educated and proficient. So that with the present methods the Indian farmer is in a vicious circle, far too many men work on and must live off the same small piece of land. Human life and labour is the cheapest and least efficient of all commodities sold in India. To get some of it off the soil and into productive industry is of the first importance in agricultural progress in India.

Then too it must be remembered that with the present faulty methods of distribution (in the economic sense) of commodities, a large crop may be ruinous to the farmer. If India with its present population and standard of living has a good crop of any staple commodities which also coincides with a good crop in other parts of the world, the price the Indian farmer receives is likely to be less than the cost of production. So what is needed is not a cry for economy, but a cry for increased consumption, not a philosophy which calls for few wants and those easily satisfied, but a philosophy which recognises that the wonderful variety and wealth of commodities in the world are for human use and service. A more complex and richer life is highly desirable in India. We need not only more people to consume, but a higher standard of living so that each individual will consume more of that which is produced. One of the discouraging factors of Indian life is that it is so slow to demand a higher standard of living. A higher standard of living must be at the foundation of any improvement in Indian agriculture.

APPENDIX I.

After-careers of the students of the Agricultural Institute, Allahabad.

Number of persons trained by the Institute from 1912-23	101
Number serving in the Agricultural Departments (mostly of Indian States)	28
Number farming their own land	6
Number serving as teachers in Agricultural Schools (mostly Missionary)	15
Number serving as teachers in General Schools	6
Number serving as Rural Secretaries of the Y.M.C.A. ...	2
Number studying agriculture at Edinburgh	1
Number serving in the Revenue Departments (Indian States)	11
Number serving in the Forest Departments (Indian States)	2
Number serving in the Co-operative Departments (Indian States)	2
Number receiving training for Mission Co-operative work	1
Number serving in other Departments	3
Number whose present employment is not stated	21
Number deceased	3

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APPENDIX II.

Note on cross-breeding by Dr. H. G. Kribs, Ph.D., Agricultural Institute, Allahabad.

It is hardly necessary to go into the principles that underlie our appreciation of the value of cross-breeding—this I will do later.

The fact is that every gene (the factors that are responsible for the development of unit characters) is in a condition of unstable equilibrium, and gives evidence of its unique individuality best when its mate shows a slightly different hereditary thrust or is widely contrasting. The significance of amphimixis lies in the introduction of these variations.

In the development of a dual purpose cow in India four general characteristics are needed—milk, temperature, disease and endurance adaptations, each of which depends upon certain genetic combinations for its expression. In India milk giving power has been reduced to a minimum through natural selection, the others are virile.

The milk giving power can be brought back in selected strains by a long process of artificial selection (breeding), or by cross-breeding with another type that could stimulate the milk giving genetic combination without disturbing other factors that are essential.

Such a combination would seem possible by crossing the dual purpose Ayrshire of Scotland, relatively high in milk production, with the dual purpose cow of India, low to vanishing in milk production.

This has proven unprofitable because the selective sortation of genetic material that developed a successful issue in the one (Ayrshire) is impossible in the other (*deshi*). The Ayrshire has developed to its present profitable rating with a genetic combination that favours a heavy hair coat, and limited pigmentation and glandular secretion in the dermis.

Any contribution that the *deshi* cow can make toward a profitable dual purpose must be associated with a high hair coat, abundant pigmentation and free functioning of the dermal glands, so that while the F_1 generation of such a cross may show hybrid advantages here and there, further crossing necessarily sets free allelomorphs that inhibit the end in view.

The Holstein-Friesian, on the other hand, will cross with *deshi* cows, especially Haryana, and throw a profitable genetic combination for dual service for several generations. This seems contrary to general cross-breeding expectation, as from the F_2 generation onward unfavourable combinations usually arise.

In the case of many cows raised by Colonel Matson at Lucknow, the genetic grouping for constitution, temperature, disease resistance and milk is seldom disturbed in crossing back or in crossing hybrids. I have checked 25 or 30 progeny of this sort, and find excellent results, the milk yield being from 4,000 to 15,000 lbs., with the other essentials undiminished in vigour. Many of these were crossed back to *deshi* three-fourths, seven-eighths and one or two fifteen-sixteenths.

Colonel Matson's results have been anticipated in certain crosses in U.S.A. and Brazil, where recombination (chromosomal or genetic) has taken place after crossing Indian bulls with American types, and a highly resistant breed has developed.

Evidence seems to be that the crosses are not between heterozygous strains, and such recombination takes place readily in cows when there is no "roughing" factory involved, a factor which the Ayrshire seems to introduce, but the Shorthorn and Friesian do not.

Oral Evidence.

38,531. *The Chairman*: Mr. Sam Higginbottom, you are Principal of the Allahabad Agricultural Institute?—Yes.

38,532. You have been good enough to give us a note of the evidence which you wish to put before the Royal Commission; is there anything you would like to say in addition to that at this stage, or are there any corrections which you wish to make?—Dr. Kribs of our staff was kind enough to prepare a note on cattle breeding and crossing which I sent to the Secretary.

38,533. Yes, we have that. Are you paying any local taxation or cesses?—On the original grant of land we are not, but on all the rest we are paying the ordinary land revenue.

38,534. But no local taxation or local cess?—Not as an institution; the District Board has taxed us personally about as much as the income tax, but not as an institution. The second statement,* which is with regard to the trenched field, you will notice is an approximation; that is a field to which I called your attention the other day as we passed it. We estimate 20 maunds of grain per acre for the 2½ acres field; unless we have a calamity that is about how it will work out.

38,535. *Mr. Calvert*: What is the grain?—It is *berri*; there is a good deal of mustard, barley, grain and linseed; it is the common mixture of the district; it was really a catch crop after *juar*, without irrigation.

38,536. *The Chairman*: Turning to your note of evidence, are you able to get into the districts and, apart from your duties on the farm, interest yourself in the ordinary problems of the cultivator?—Since my return in October I have not done so, but I got round a good deal before that, and especially while I was Director of Agriculture in Gwalior. From 1916 to 1919 I got into a great many villages in Central India, and it has been my custom to go regularly into villages near by us so as to keep myself in touch with the conditions under which the farmer is working.

38,537. How long have you been in India?—Since November, 1903.

38,538. In various posts?—I first of all taught economics; I then got the idea from studying the villages with groups of Indian students that we should be teaching agriculture; so my Mission gave me permission to study agriculture, and, if I could raise the money, have an agricultural institution. I returned from America after my first furlough in 1911, and all which you saw the other morning has come since that time.

38,539. I think you said a moment ago that you were in Gwalior State?—Yes. That was a war measure. The Maharajah of Gwalior got me to draw up a scheme; then I advised him to get the best officer the British Government could let him have; he pointed out that during the war every man was busy; the British were not likely to be able to spare a man at that time; he said: "It is your scheme; you carry it out." So I took it on for three years. Then, when he could get other officers, I left it.

38,540. You point out, in answer to our question, that close co-ordination between the provincial departments and any central research department that may exist is essential. Have you pondered at all the way in which you would suggest such co-ordination might be achieved?—I am not a Government servant, and I do not know always what is at the back of actions taken, but as an outsider it seems to me that the greatest hindrance to this co-ordination is the inequality of pay; an Imperial officer is in a different grade from a provincial officer, though the Imperial Department is very largely recruited from the provincial departments, from men who have served their apprenticeship in India in a particular Province. Government rules are naturally inelastic in the employment of men, but if there could be a little human understanding so that where a man is doing good work he

* Not printed.

might be recognised and kept where he is doing his work, without being transferred, I think that would be a good thing. As a rule, if a man succeeds in a post, he is transferred to some other job, possibly totally unrelated to what he has been doing, and all his experience is practically lost; the man who succeeds him may have a different idea of things and may tackle the problem in an entirely different way. I think it is a matter of preserving continuity; when a man has really got hold of a problem he should be left in that place until he has worked it out.

38,541. Are you familiar with the organisation of Agricultural Departments in the United States of America?—Somewhat; I made a study of them some years ago. There is no uniformity there; for instance, in Ohio State the experimental station is entirely separate from the University. The same is true of Cornell, and at the New York experimental station at Geneva; though some of the University Professors in agriculture do go out on various kinds of extension work, the experimental station is entirely separate. In Ohio it is at Wooster, 80 miles from Columbus, where the State University is; and Cornell University is at Ithaca; that is the New York State College of agriculture, with the experimental station at Geneva. In other States the experimental station and the University College of Agriculture are practically together, in different branches.

38,542. Then you have the Federal Department as a very powerful body indeed?—The Federal Department is powerful, and through the Smith-Hughes and Lever Acts, where States were slow to take up agricultural education, and where they were a little backward, the Federal Department, which might be considered to correspond to the Imperial Government, stimulated State activity by making grants to State local bodies. One does not like to suggest that India can learn much from the United States in those matters, but it is just possible; at least, there they have worked through this same problem of the relation of a central authority to the different State Governments. In the United States there is a good deal of co-ordination, not always official, but between men working at different problems; the problem interest will very frequently unite the man in Washington with the men in the different States working at the same problem.

38,543. Have you ever heard any complaints about or criticisms of the Central Department of the United States?—Only that it does not pay enough; all the men think they are too low paid, and I think they are. You do occasionally hear complaints, but the general consensus of opinion is that it is doing the work that has led to such great increase in production and crop protection, and that whatever criticisms are levelled against it are entirely outweighed by the economic value it has brought to the country.

38,544. On page 538 of your note you are talking about the improvement of wells. Have you studied the economics of irrigation by tube wells?—We have had a tube well for a number of years; it was one of the first put down; unfortunately it collapsed a few months ago, and we let a contract for a new one. We feel in our particular position that we cannot get along without a tube well; but I think a great deal more study needs to be done on tube wells; not enough men properly qualified have been working on them. For instance, when we put our tube well down it cost us about Rs.20,000, and the understanding was that it would practically last for ever; it has lasted ten years, and its collapse comes at a time when my budget is full with other things, so that I do not know how I am to pay for a new one. But we must have a tube well; we must have water for our dairy.

38,545. When you say it collapsed, what happened?—I am not an engineer, but as far as I can gather from the engineers, the Ganges sand

was finer than the engineers had thought; it had come through the strainer and had left cavities. As I understand it, the Ganges valley is an ocean of water-bearing sand, with islands of clay in it; when we had sucked the sand out from under a bed of clay, that clay fell in and simply crushed the tube like an eggshell. That is as I understand it, but I am not an engineer, and I can only repeat the explanation that has been given to me. It seems reasonable.

38,546. Quite apart from this study of the purely technical problem, there is the field of economics, that is to say, the problem as to what type of land it pays to irrigate from tube wells, and what class of crops must be grown in order to pay for the water so raised?—Yes. As I remember it, its cost varies from two to four annas per thousand gallons of water raised from our tube well; that cost varies under different conditions. That means that you can only grow money crops; crops that have a value. I doubt very much whether it would pay to irrigate wheat on ordinary land in this district with a tube well; you have got to have crops with more money in them than that. I think sugarcane would pay when sugar is at normal prices; we might then have wheat in the rotation; tobacco would pay, and turmeric and all kinds of garden produce would pay well under tube well irrigation. I have not yet been able to find anybody who could give me very much accurate information about it; there is a good deal of guessing. Our water table varies very much; the strata into which you bore and the amount of water that can be got from a tube well vary very much. As far as I understand, no engineer can tell you how much water you are going to get if you put down a tube of a certain bore. I take it that means that a great deal more experimentation and investigation must be done. There are so many wells in India, and there is so much land that can never be irrigated by flow irrigation: if it is ever to be irrigated at all it must be irrigated from a well with subsoil water, and we have an ocean of it at our feet; the question is how to get that water on to the land economically.

38,547. On page 538 you are dealing with the question of contour irrigation, and you point out that terraced land is very often so costly that the subsequent cultivation cannot pay for the cost of the work; you say that therefore a number of officers skilled in contour irrigation methods is needed. Is it your suggestion that officers of that sort could so improve the methods of contouring as to make it an economic investment?—Yes. There are millions of acres to-day that are commanded by water, but because they are not level they are not irrigated. If the water is put on them as they are now, it simply runs down the slope to the bottom, instead of being taken in contours and zigzagged down. The secret of contour irrigation is to irrigate on the slope, never to allow the water to have much movement on it, but keep it constantly zigzagging down. Over a good part of central India that I know there is water available, but this sloping land is not irrigated because people think it must be terraced before they can irrigate. I presume most of the terracing work that has been done in India was done without taking any account of the cost of labour; the people doing the work had nothing else to do and so they did it, whereas if their labour had had a value and they had kept accounts, they would never have done it.

38,548. I think you have had great success with this method of preventing erosion, and indeed, of encouraging the depositing of silt, by building of small bunds?—Yes, and we felt that this method could be multiplied over a great part of India. It has already been done in some parts. I got the idea from Sir Sydney Preston's work in Gwalior, where he has put up a great many of these bunds. But there is one thing which we have not worked out yet. Some of these bunds collect an enormous amount of water. In this part of India at any rate, some time early in October we

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let all that water out; it runs down the natural drainage channel and is lost. Of course, it is true that if you leave it in the tank you can grow no crops in the tank bottom. I believe that when we release that water there are some crops that could be grown on, say, one watering, so that if as we let that water out of the tank it might serve a purpose rather than be entirely lost. We ourselves are studying that problem now. The trouble is that frequently the cost of doing the thing is so high that it would not be an economic proposition.

38,549. Let us see: you build your bund at the proper place, then at the end of the rains you leave the water sufficiently long for it to deposit its silt, and then you let the water go down the natural channel past the bund in order to make the silt available for cultivation?—Yes. For wheat or any *rabi* crop.

38,550. And your idea is that below the level of the bund there should be some cultivation which could be aided by one single watering?—Yes. I believe that is another thing which needs to be worked out. A good many irrigated crops depend upon rain some time in December or January. If we could give the plant a good start by the use of the water from behind the bund just before sowing, we would almost certainly get a good crop.

38,551. We noticed when we were going round your farm that you were applying sewage to the land? Have you had any experience of sewage sickness?—Not on our land.

38,552. Are you at all nervous about that?—Yes; the municipal sewage farm is just at the other side of the railway line; it is badly over-dosed with sewage and needs opening up and also more cultivation. There is altogether too much sewage available at Allahabad for the amount of land that they are trying to put it on. For a number of years I have been trying to prevent that sewage going into the river. We have also learned that sewage is a very dangerous thing as far as the public health is concerned. If the sewage is used on vegetables that are eaten raw, internal parasites such as tape-worms, round-worms, pin-worms are a danger. I am now having a weekly test made by a trained man. He takes a sample of the sewage once a week; and also tests the vegetables and the chewing variety of sugarcane offered for sale. After washing them very carefully, he then puts the liquid under the microscope.

38,553. What organisms does he find?—He finds tape-worms, round-worms, pin-worms and a little of *amoeba* of the dysenteric type.

38,554. By what process is this municipal sewage treated?—None at all. It just comes over the river as raw sewage. That means that a great deal of land is necessary. Fortunately we have a great deal of sandy land which is highly absorbitive and easily workable. I do not think a stiff clay or some of the black cotton soils would be suitable, as they hold the water for a long time; but fortunately there is a great deal of sandy soil there whose absorption powers are very great, and, further, it is very easy to cultivate that soil soon after irrigating it.

38,555. On page 539 you are dealing with the question of the introduction of improved varieties of sugarcane, and you point out that while the Government stations have managed to evolve very excellent strains their adoption by the cultivator is slow. What is your own experience in that matter? Are you growing Coimbatore canes?—Yes. We are growing 213.

38,556. Are you growing any *deshi* sugarcane at all?—No; they are not worth the land.

38,557. Only improved canes?—Yes. I think that India is more favourably situated for the production of sugar from cane than perhaps any other country in the world; and I am very glad that the Government is taking

interest and is breeding better canes. The question now is to get the cultivator to see the results and adopt these improved varieties. The consumption of sugar in India, I think, is only about one-fifth of that in the United States, and I think that, considering the Indian is generally a vegetarian, the consumption ought to be much greater than it is, except that perhaps in the case of the well-to-do classes, or the middle-aged lawyers who develop diabetes from eating too much sugar, because they are usually people who lead luxurious lives, whereas this is not the case with the labouring classes who work very hard, and sugar acts as a source of energy to them.

38,558. Then you deal with this problem of the monkeys, or at any rate you set out the problem and you enclose a letter* from a gentleman whose view is that the greatest contribution that the Government of India could make would be to provide free railway transport for monkeys?—Yes; was not a trainload of monkeys trapped at Brindaban and sent down to Katni? The residents of Katni wanted to know why they were made the recipients of this blessing; they could not understand why they were so favoured, and said that they would be only too willing to forego this pleasure. This wild animal problem just now gives me more cause for consideration than almost anything else. Maize, for instance, will give you four to eight times as much grain as the best variety of *juar*, and it is one of the best foods for man as well as beast. On our sullage water I think we could grow 80 maunds per acre of good Southern maize. We very seldom get 20 maunds of *juar*, or *sorghum*, and yet we find that it is almost impossible to grow maize. If we could succeed in keeping the crows and the porcupines and the jackals away from it, it would be a good thing indeed. I know I had a plot of some very fine seed maize, and I put four watchmen to watch it. One night I went round the place and I noticed a big fire blazing. When I went up to the place I found the *chankidars* roasting a number of the ears of corn that they were supposed to be watching and protecting. This shows that the cost of protecting your crop is very great indeed, not only against wild animals, but also against human beings. That gentleman who sent the letter to the Press regarding monkeys very frankly does not face the issue. The difficulty is that the monkey catcher catches the monkeys from his village at eight annas apiece and takes them to another village; then when that village is tired of them the monkey catcher goes there and receives 8 annas more for each monkey, and he may transfer the monkeys back to the village from where he took them. This process of transferring monkeys from one part of India to another does not get us any further forward.

38,559. Have you any constructive proposals to make with regard to this question?—The only thing to face is the killing of wild monkeys, which would wound the religious susceptibilities of a great many of the people of India. The monkey knows nothing of birth control, and he simply goes on multiplying, so much so, that he has become a very serious pest to our farm. Some of them know that it is dangerous to come right into the farm, but they just keep round the corner and do a great deal of damage.

38,560. *Sir Henry Lawrence*: Can you remove them to the forests, or would they come back again to the cultivated areas?—The monkey would go wherever there was food to be got.

38,561. Can they travel very long distances?—I do not know; but I think they will go a long way after food.

38,562. *Mr. Calvert*: Was there not a very roaring trade in the export of monkeys at the time of the monkey-gland treatment?—I do not know.

38,563. *Professor Gangulee*: In shipment only?—I suppose so. But if we could develop a trade like that it would be a very fine thing indeed. We have got to get rid of them. Naturally, having many good friends among

* Not printed.

the Hindus, I am not willing to suggest anything which I know is going to wound their religious susceptibilities.

38,564. *The Chairman*: Have you noticed any change of opinion in that respect during the years that you have been in India?—There are two opinions in this matter I think; one opinion a man is willing to express in order to exploit a political object, and another which he will tell you in private.

38,565. *Mr. Kamat*: But if the monkeys were killed by non-Hindus, do you not think that the Hindus would manifest a spirit of tolerance?—Sometimes you might be safe, at others you would start a riot; it all depends upon the circumstances.

38,566. Supposing a party of Mahammedans killed the monkeys what would the Hindus do?—I remember a few years ago a havoc was wrought by monkeys and one of them started biting the people. Somebody brought a boy to my wife with his cheek practically stripped off by this monkey. A party of Hindus got the monkeys up a tree and asked me to shoot them with my gun. I refused to shoot the animals saying that if I did anything of the kind I would probably be getting myself into jail. Subsequently one of my colleagues, on obtaining an undertaking from the people that they would not make a complaint to the Magistrate, shot the monkeys. As I say these were Hindus who came to us begging us to shoot the monkey, so that there is a time when even Hindus are willing to see monkeys shot. Of course, they will not do it themselves; they will ask others to do it for them. Again I say, it all depends on the circumstances. Very frequently the mere shooting of a monkey might be the spark to a big riot and that is a thing which any wise man would always wish to avoid.

38,567. *The Chairman*: On page 539 you deal with the question of agricultural education, and you give it as your view that the systems of education in vogue in the Philippines, amongst other countries, have made a great contribution towards bettering the agricultural practice. Could you tell us a little more about the curriculum and so on in the Philippines?—They have there very distinctly agricultural schools with school gardens where every child has his own individual plot and he goes into his garden at regular hours, grows things under supervision, the child doing the work and getting the produce.

38,568. Is that in the primary school?—I think it is from the very beginning. I do not know really. But in Canada they have done perhaps more than any other country on earth in the way of using these schools for teaching agriculture. There is one thing that I would like to say particularly with regard to agricultural education. Most of our education in India is so strictly literary that the only manual labour in which the pupil ever engages is the using of the pen, which certainly does call for a certain amount of manual dexterity! But we now know that manual dexterity, the using of the hands, is a marvellous stimulus to the brain; and has not India handicapped herself in failing to learn the use of the hand? There is an article in a recent issue of the *Scientific American*,* by Professor G. Elliot Smith, on the meaning of the brain which brings out the enormous improvement in education obtained by teaching the use of the hands as a stimulus to the mind. I do not know whether that answers your question. Then in the Southern States of America also they have done both; they have had the village school where, as soon as a child went to school, he was put on to doing something in agriculture and the girls were doing something about home making; and then the farm demonstrator was going out to the parents of the children in the school. Conditions in the Southern States of America a few years ago were just about as bad among the Negroes as they are in rural India; most of those bad

* January, 1927, page 16.

conditions have been wiped out through agricultural education to the child in school and the adult on his farm.

38,569. Would you agree that it would be a great advantage if it were possible to devise a curriculum in agricultural schools which would result in a considerable proportion of the students passing through such institutions going back into the business of farming on a commercial basis? In other words, would you not regard it as a feather in your own cap if a larger proportion of the students who pass through your institution went in for farming?—Yes; but I think it is well to bear in mind that amongst the systems of education, agricultural education is recent; it is modern compared with a good deal of other education. If you study the history of agricultural colleges in the United States, you will find that, in the first few years, of those who graduated, less than 10 per cent. got back to actual farming and 90 per cent. were absorbed as teachers and demonstrators. Then there came a time when the teacher positions were very largely filled and it required only 15 to 20 per cent. to keep them going, so that we actually got over 60 per cent. of those trained going back to their own land or their fathers' farms. I think India will have to repeat that experience. The great difficulty to-day in starting anything is, where is the man to do it? So many of the men studying in the agricultural colleges of India are not being trained as farmers. They are being trained as laboratory technicians of one sort or another having had little if any experience of farming. I remember the Principal of a Government Agricultural College once remarking to me that he could never understand why he had been appointed, as he had never learnt how to grow a bunch of onions; he was one of the finest Economic Botanists. I think that is one of the dangers we ought to wipe out. Among our teaching staff for agriculture in India we must try to get some farmers as well as strictly scientifically trained men.

38,570. Do you find that the cultivators from the neighbourhood come and see your farm?—Yes, a great many come. I think if we had a dozen iron ploughs with oxen we could rent them out from the close of one monsoon to the beginning of the next. We have done a little of that, but we have not had the equipment and the staff to do that sort of thing. We have also sent our silage cutting outfit to some of the villages and filled earthen pit silos with silage for them. We could do a great deal more if we were not so short-handed as far as trained men are concerned, as also equipment which takes money to provide. Our experience is that if we do not rush too fast these Indian farmers grasp the thing and when they are satisfied that the way of doing it is right they are willing to try it. The farmers round us have now sufficient confidence in us; I have talked with a great many of them and I said "You know this land and you know that it produces more now than it did; to what do you attribute the increase?" They say, "It is because you use these ploughs which not only go deeper than ours but they actually turn the soil over, so that you are constantly adding manure in the stubble, &c." We are greatly encouraged by the way our neighbours have copied us and are eager for our help; they come constantly with requests and I wish we could do much more than we are now doing for them.

38,571. Have your neighbours showed any signs of wishing to copy your practice of bunding streams and so preventing erosion and encouraging deposit of silt?—Yes; a number of them have come and said, "in our village there are conditions like this; if you would put the bund we would pay for it." Thus each one whose land is bunded would pay his proportion of the cost. That is, you put in a *bund* which reclaims 50 acres, and one man has 5 acres and another 10 acres reclaimed; each man's land is benefited and each would pay his proportionate share and thus the whole thing would be paid for. That is one thing we are very anxious to do. For

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instance in the Mirzapur district we have been asked by the villagers themselves to help them.

38,572. And where you have attempted that work, have you financed it by means of loans?—We have not actually done it yet because we are so busy and shorthanded that we could not give the time to it without neglecting our classes. It seems as though every college should have one or two handy men who could be definitely assigned to such work. When a man has a class to teach, he cannot do his duty to that and go out as he should.

38,573. Do you form the view that there has been progress in agriculture as practised by the ordinary cultivator in India since you have been in this country?—There are centres unquestionably where very much better practice obtains now; there are centres where great progress has been made; but I do not know whether you could apply that in general; for instance, if you ride on the train from Allahabad to Cawnpore you see wretched cultivation and miserable crops, and the enormous amounts of waste land which would respond to better methods; but I do know of places where great improvement has taken place.

38,574. Do you think that rural public opinion is moving at all? Do you think there is a growing demand for better things?—Indeed I do; that is the most encouraging thing; a great many of the landlords are showing to-day much more interest in rural development than I have seen before; I think that is increasing.

38,575. In your experience, have you found literate cultivators more easy to approach with suggestions for improvement than illiterate cultivators?—It is very few villagers who are literate at all. The man who has been to an agricultural college or to an ordinary college and is an educated man is usually the man who is asking for more information and better methods. For instance, hardly a day goes by when some land owner or other does not come for help and advice on some thing or another; he intends to go back to his own land and try and put it in practice, say with regard to machinery, improved ploughs and things of that sort.

38,576. If a forward movement is to be made, in what direction do you think it ought to be made, mainly in the direction of education or in the direction of further technical advice in the shape of demonstration and propaganda?—It is almost impossible to say that any one thing is separate from the other; it is a whole army moving forward together.

38,577. You would rather advance all along the line?—Yes; I have no faith in the quick and ready methods in either education or agriculture. One thing depends upon another so much; they need more education; they need more technical advice; these things are not mutually exclusively; they must go together.

38,578. And probably sanitation, better drinking water and so on is as important as anything else?—Yes, better health; that is also part of the programme.

38,579. *Sir Henry Lawrence*: In this book, *The Gospel and the Plough*, you refer to the extent of teaching given by Colonel Hudson in the jail. Have you known of any other jails which are centres of agricultural improvement?—No; I have only known of that one. I believe there have been others,* but that one was my neighbour, and I had good opportunities of seeing it.

38,580. Do you think that more might be done through teaching methods of improved agriculture to the jail population?—Yes; it is one of the finest schools we have got because we can compel attendance.

* Colonel Palmer of the Naini Central Jail already has a scheme up before the Local Government for teaching agriculture.

38,581. I think Colonel Hudson was managing it very well and he never had any trouble; it had a profound effect upon the prisoners, because of his interest in giving each one a chance.

38,582. How long did it work, for ten or twelve years?—More than that; I first knew him in 1903; he had been at it for some time then, fifteen years at least.

38,583. Do you know how many people pass through jails in India?—I do not know. I believe the United Province is the largest single jail administration in the world, about 55,000 persons. I do not know what it is for the rest of India.

38,584. I think it is from 500,000 to 700,000 in the course of the year; so that it would be an education on a pretty considerable scale if it were adopted?—Yes, and you know that can be done under proper control. I never saw anything like the results that Colonel Hudson got.

38,585. *Professor Gangulee*: Colonel Hudson's work was chiefly confined to vegetable garden, I suppose, and he did not take up any crops?—He had good silos when Pusa did not even think of them. He had a very great advantage. He had been a Military Medical Officer for sixteen years and so was familiar with all methods of camp sanitation, and he went in for the system of trenching which he considered proper from the sanitary point of view. It was good from the farmer's point of view also.

38,586. *Sir Henry Lawrence*: Can you tell us something of your method of education and in what way you could link that up with higher education under the University? Have you any scheme for that?—Yes. When I began this work, I was looking forward to a college in agriculture which would give training to a young man in India equal to what he would get in Europe or America; but we have had an educational revolution here and the United Provinces students now get two years in an Intermediate College in the University. I am eager that our college should be affiliated to the Allahabad University.

38,587. Was there any obstacle?—It has not yet come to pass.

38,588. How long have you been working for it?—Ever since we began in 1910. I realise this, of course, that before we can expect recognition as an Agricultural College we must have the necessary staff and equipment, and it is only just recently that I felt we had sufficient equipment for the Intermediate. I do not think we have equipment enough now for a degree college; we need about three lakhs more of non-recurring expenditure for additional laboratories, hostel and equipment, and, in addition, a lakh of rupees a year to our income to pay for the additional staff so as to teach for the degree. I have had informal conversations with some of the University people, and they are enthusiastic on this. For a number of years I was put off by their saying that in this Province Allahabad University was an affiliating University, and that when any college was affiliated, the Cawnpore Government College would be the degree college. The Cawnpore College has not been an educational institution so much as a departmental institution for the training very largely of subordinates in the Revenue and other departments. It is only of late that it has been organised for the training of farmers. They do now offer a four-years' course for a Licentiate in Agriculture; but nobody takes it that that means a degree in agriculture; it does not. I doubt very much whether the four-years' course is up to a University standard in agriculture. Now that Allahabad University has become a residential University, I think that obstacle will be removed, because Cawnpore will go with the new Agra University, and we are within the geographical limits of the Allahabad University. It is a question now largely of finance, as I understand it. This is informal; nothing yet has been passed by the University, but from

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informal conversations with the Vice-Chancellor and the men in the Faculty of Science, if I gather right the sense of the University, they are eager to add a Faculty of Agriculture. Then the question is: " Shall Government start its own agricultural college, or shall it make use of the facilities that the Agricultural Institute has? " The feeling in the University is that if they can have some control over the appointment of the teachers and the institution, it would rather have our institution than start a new one. We frankly recognise that the University has the right to lay down the course of study and to see that it is properly taught by properly qualified teachers. We are now working through those details so as to get it satisfactory to both parties.

38,589. So that you are on your way to achieving this result?—Yes, I hope so.

38,590. You do not see any insuperable obstacles now standing in the way?—I hope not; I do not know what is ahead of us, but as far as we have got it has been all right. It is a question now as to where the money is to come from.

38,591. Are you prepared to accept a Government grant?—Yes.

38,592. Have you asked for one?—No, not yet.

38,593. *Sir Ganga Ram*: Do you get any now?—No; in the life of the institution we have received two grants from Government, one of Rs.11,050 to help with the tube well, and Rs.42,000 to help us with our science building; but we have had no recurring grant of any kind. We have spent about 15 lakhs in developing the institution to its present state.

38,594. *Sir Henry Lawrence*: You are teaching a considerable number of Indians in your institution, are you not?—Yes, 70. Before we had any recognition from Government we had very great difficulty in getting students to come. You cannot blame the Indian student for desiring a degree; I would not have gone to Princeton if at the end of my tuition I should have got no degree. The Indian wants to go to an institution which is recognised and the degree of which means something.

38,595. Have you any Indians on your teaching staff?—Yes.

38,596. Is your teaching staff mostly Indian or mostly American?—We have eight Americans and at present we have only six Indians. Few Indians with the necessary qualifications are willing to live on our missionary pay. They can do better elsewhere.

38,597. Are these Indian teachers men trained in this country or trained in America, or where?—They are trained in this country; we cannot pay salaries that will satisfy the American trained men; we have had several who have worked on missionary allowances, but they say they can do so much better elsewhere, and they go. Our ideal would be to have about half and half Americans and Indians. Our difficulty in getting Indians is that there have been so few Indians with the necessary training. We want a man to do a particular job, and, other things being equal, to-day we would rather have an Indian; but where can an Indian get training in India in agricultural engineering? Where can he get training in horticulture? Where can he get a proper training in dairying? We are teaching dairying, but the course laid down is very short; you cannot turn out a first class dairyman in two years; it is utterly impossible.

38,598. So that at the present time, though you are anxious to obtain Indian teachers, you cannot find a sufficient number of men with sufficiently high class education?—Yes, and that is one reason why through thick and thin I have held out for an agricultural college; we must have some place in India in which to give the Indian the same chance that he gets in Europe or America. With the possible exception of Poona, there was no agricultural college in India where he could get that chance, and Poona was so very much

under-staffed, although for a good many years it was the best, and I think still is the best, agricultural college in India and has turned out the best men.

38,599. What is the practice in the United States? Are posts in these scientific institutions reserved for Americans, or do they bring people in? If they find a man of higher qualifications in Europe, do they invite him over?—Yes; it is amazing to contemplate the number of great teachers of agriculture that Guelph has supplied to the United States. The father of animal husbandry, Dr. Craig, was a Canadian trained in Canada, at Guelph, but that makes no difference. America has not sent to Europe for very many teachers, because Europe was not giving the kind of training that was wanted.

38,600. There are instances of men being imported from other countries to teach in the United States?—Yes, in certain things.

38,601. Do you know of any cases of men of outstanding ability?—I do not recall them now, but I know there are some; I did once make a list of the men from Guelph, a Canadian institution, who went into the United States and occupied very high positions. Some of the leading men who made their reputations in the United States were born and bred British, many of them being Canadians.

38,602. *Sir Ganga Ram*: Who advised you to put the tube well in?—The United Provinces Government. I might say that our tube well in the leper asylum was the first tube well put in in the United Provinces. When Mr. Moreland was Director, he said he had heard of these tube wells and would like to try them, and he said that if he spoiled our tube well he would give us a new one. I agreed, and he bored, and it has apparently given us a supply of water; we took from 12 to 14 thousand gallons an hour; it has gone on and we have never had any trouble; it cost us very little.

38,603. Did he take a section of the soil before advising you to do it?—I think he did.

38,604. Have you that section?—Not that I know now. Of course, this was in the early days of tube wells, and very little was known about them.

38,605. How many years ago?—I think they started in 1914 or 1915; we paid the bills.

38,606. Have you got a copy of that bill?—It cost us about Rs.20,000.

38,607. Is that including the engine?—No, the engine and pump were separate.

38,608. What size tube well was it?—It was about 10 inches; we were never able to use the pump they gave us on that tube well.

38,609. How deep did it go?—188 feet from ground level.

38,610. And it cost you Rs.20,000 without the engine?—Yes; I am speaking from memory. I know we spent altogether, including the Government grant, over Rs.70,000 trying to get water for our place. We had one try to get it from the river Jumna; that is what the big bund represents, that is there going down to the river with trees on it. The river cut in and took 400 feet of 10-inch pipe away from us one year. So we gave up trying the river.

38,611. Could not you pump from the river?—We accepted advice from the Government Engineer; he was the only man who seemed to know anything at that time.

38,612. You could not see your way to pump from the river?—We did try; including the pump and engine we spent about Rs.50,000 in trying to pump from the river. The Allahabad Municipality also has trouble with the water works owing to the vagaries of the Jumna river cutting in and

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swinging from one side of its bed to the other. It would bankrupt anybody but a railway to get their supply of water from the Jumna river in the way the East Indian Railway gets it.

38,613. Are you now using all the sullage water of Allahabad?—No, we are only using two lakhs of gallons a day; about a million gallons is running into the river.

38,614. Even now?—Yes.

38,615. Why cannot you use the whole of it?—We cannot get land to put it on. A gentleman in America gave me 50,000 dollars for the purchase of land; I asked Government to help us; they told us to try and buy land by private treaty. I was very fortunate in being able to buy a village by private treaty. Then I asked the local authorities to help us to get the next village so that we should have another 400 acres for sullage water, which would have taken most of that million gallons, and I was prepared to pay the Municipality for it.

38,616. Do you pay anything now?—We pay Rs.4,000 for a lakh of gallons per day per year. When we had bought the village on the advice of the Government by private treaty, I then asked Government if they would secure the cultivation rights, so that we could square and level up the land and get the sullage water on to it. I was informed that by law as zamindars they could not acquire the cultivating rights for us; and so for six years we have had that land unable to do anything. Then with regard to this village of 400 acres that we wished to get, there was a little squabble in the Municipality, and it ended in a sort of faction. It was owned by Mohammedans, and we wanted to get the land to put sullage water on it. They knew the sullage water was flowing into the river; there was some communal difference so that we were prevented from getting the land, and I had to return 30,000 dollars to America, which rather hurt me, because we could have made such good use of it.

38,617. What do you mean by the cultivating rights? When you got the land could not you cultivate without reference to anyone?—The zamindars own the land, but the tenants have inalienable rights to occupy and cultivate.

38,618. Occupancy rights?—Yes. The holdings of these tenants were all scattered, and I asked them to allow me to square up the land; I said: "You have got five acres scattered here; I will give you three acres in a solid block under sewage water which will make you rich if you work it in the right way"; but they were not willing, they were so afraid that I wanted to trick them and could not understand that I wanted to benefit them.

38,619. You are now paying Rs.4,000 to the Municipality?—Rs.4,000 per year for a supply of one lakh gallons per day; we are paying them Rs.8,000 per year; we are getting only two lakhs of gallons, because that is all the land we have got to put it on.

38,620. What is the total discharge of that sullage water?—I am not quite sure; according to the latest figures I had they were getting from 15 to 18 lakhs of gallons a day; when the whole scheme is complete they will have 35 lakhs of gallons per day; they have only got 120 acres on their own sewage farm. They had only 80 acres until I pointed out to them how they could get more. They were only getting Rs.10 an acre for their water; I showed them how they could get Rs.200. The rest of it goes into the river just where the pilgrims bathe.

38,621. Does no one object?—They have objections nearly enough to fill this room, but they do nothing.

38,622. We were told yesterday by Dr. Fowler that you could convert that sullage water into manure?—It is manure.

38,623. But it can be converted into solid manure?—But this is surely the cheapest and most economical way of disposing of it.

38,624. But instead of allowing it to go into the river, could not you make use of it in that way?—By drying out the sludge?

38,625. Yes?—It could be done, but it would be at a very much greater expense; and, remember, it is not my water; it is the Municipality's.

38,626. Could you consult Dr. Fowler and advise the Municipality to set up works? I should say it was a heinous crime to contaminate the water?—It is.

38,627. Because a lot of people down below must be using that water for drinking purposes?—I, myself, think it is almost verging on the criminal. There was an outbreak of typhoid. When the Municipality were cleaning their engines, their outlet for the sewage was about 150 yards above the intake for the East Indian Railway; they let the sewage into the water and the railway was pumping it up for railway use. I saw a Scotchman who had just put his two little boys in the cemetery; had I been in his place I should have had something to say to that Municipality. There was a serious outbreak of typhoid resulting in several deaths, and that stuff is still going into the river; it is a disgrace; the land is there, and there are people who are willing to use it, but the work is blocked.

38,628. For some time you have been using the tube wells?—Yes.

38,629. You said the cost was 2 to 4 annas per thousand gallons; that is an enormous figure; is it correct?—That is what it cost us.

38,630. Do you now use sullage water?—Yes.

38,631. Do you dilute it with fresh water?—No.

38,632. You use it as it is?—Yes; of course, we divide our farm; there is a certain part of it where the sullage water never has been and never will go. The reason I took that sullage water was that under the terms on which we got the land the Municipality had the right to take our land at any time they wanted it, and they proposed to take it and bring the main sewage pipe right next door to our dairy and hostel. That would not have been pleasant for our students and our bungalows, so to protect ourselves we went into this sullage water business.

38,633. I think there must be some mistake in your calculation, because even at 2 annas, not taking the higher figure that you mentioned, for one watering over one acre it would cost Rs.37?—Tube-well irrigation is very expensive; that is what it actually cost us. Those figures were taken some years ago.

38,634. You are putting it on the land without diluting it; if I may say so, I think that is a mistake?—Perhaps you are confusing two different things. Sewage-water irrigation is one thing; for that we pay Rs.4,000 a year for 100,000 gallons a day per year; we have to take it every day that the pumps are working. The other is pumping clean water from a tube well. It varies according to different conditions; it may be from 2 to 4 annas per thousand gallons of water pumped, and this makes it very expensive for irrigation. But what does it cost with bullocks? It costs nothing like that; a pair of bullocks from a Persian wheel lifts up 2,000 gallons an hour easily and works for eight hours, the cost working out to about 1 rupee or Rs.1-8-0 a day.

38,635.—*Sir Thomas Middleton*: I think you have given a good deal of attention to the cattle question in India?—Yes.

38,636. You know that there are two schools of opinion, and, as a matter of fact, you mention it in your memorandum: one, that we have too many cattle, and the other, that we have too few. What is your view upon that

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question?—I agree in a way with both schools of thought, because we have too many of the wrong kind of cattle and too few of the right kind. But looking at the question from the economic point of view I think it is undoubtedly true that there are far too many cattle for the needs of the country.

38,637. I think you made an estimate of the number of plough bullocks in India, did you not?—No; I took the figures from the Government reports. Of the 146 million bovine cattle in British India in 1919-20 presumably 73 million are males and 73 million females.

38,638. And you worked the figure out to something like one plough bullock to five acres?—That was arrived at after consultation with a number of friends at the meeting of the Board of Agriculture. Of course, in some parts of India it is much too high and in other parts it is much too low. A good deal depends on the size of your cattle and the kind of land. I discussed it with a number of friends and we thought that that figure was very near the actual figure for Allahabad.

38,639. I wanted to get at the source of that particular calculation. If you were asked what a good pair of bullocks could cultivate in your own neighbourhood, what would you expect of them?—We do all our cultivation without any tractors and most of our land now is bearing two crops a year; and we average one pair of oxen to 20 acres; of course, they are working practically every day.

38,640. Would you be kind enough to let us know how you arrive at the cost of labour of oxen in the case of summer ploughing referred to in the statement of cost of cultivation you have supplied to us? What do they cost you to keep?—For the amount of food consumed we issue a regular ration; there is the cost of food, then there are two men in the barn who are supposed to keep the barn clean and to put the food in the manger and clean the oxen. We reckon that it costs us from 8 to 10 annas a day to keep our oxen in good condition.

38,641. I would be very much obliged if you could let me have the details of that calculation. The cost will naturally vary at different times in the year and you have no doubt adopted here a round figure?—No; it is the actual amount of ground ploughed in the hot weather. I think we put four pairs of oxen on a disc plough which goes anywhere from 8 inches to a foot deep when the ground is very hard; and the oxen in the hot weather work for not more than seven hours a day. I can send to the Commission the details of this calculation.

38,642. What I am anxious to get at is how much it costs to maintain cattle that are doing the work you describe? It is hard work in the summer as you point out?—I can send the details to you. I will make a note of that and let you have the information in due course.†

38,643. Have you ever tried to estimate what your neighbours or other villagers expend on their bullocks, or what their bullocks cost them to keep?—I have very frequently talked it over with them. When the bullocks are working they give them perhaps a seer (that is, 2 lbs.) of grain and 2 lbs. of cake a day, and they chop the fodder by hand. A very interesting fact has emerged; now that we are selling silage at 8 annas a maund a great many of our neighbours in the villages who keep bullocks come and buy our silage to feed their bullocks and they are willing to pay us 8 annas a maund. We are carrying on quite a good trade in that line. They save themselves the trouble of having to cut it, and there is the palatability of silage which the cattle like. But a lot of those village oxen are not working on the ground more than 45 to 50 days in the year and when they are not so working they are turned out very largely to fend for themselves along the paths between the fields and along the roadsides, as a result of which they live

† Not printed.

a life of semi-starvation. And here I think there is ample room for the Society for the Prevention of Cruelty to Animals in India. The way that they are turned out is disgraceful with no proper amount of food given to them.

38,644. So that the actual cost to the cultivator in different districts must vary very widely?—Yes.

38,645. Generally speaking, have you noticed that in districts where cotton is grown, the bullocks are better kept than in other districts? Is that the case in these Provinces?—Of course cotton seed is a very good bullock food. I had not thought of that. I have noticed as I have gone about India that in different tracts you get a different size of animal. I think you will see that the biggest boned animal almost invariably comes from the desert while your smallest boned animal comes from tracts where you have a very heavy rainfall and a great deal of vegetation. For instance, in Bengal your cattle and men are small compared with the Punjab where you get both big cattle and big men. And I have also noticed that where Government have at various times put down their breeding studs for horses and mules and so on, in some places no matter what they start with, they get a small animal. It is just the same in Europe and America; in North Wales for instance you get a small bone; and the same is the case on Exmoor.

38,646. You are thinking now of sheep, and not of men?—The men too, small, that is, from the chin down.

38,647. To pass to another subject, you mention the great use that Canada has made of its schools? Has your attention been drawn to the use they have made of their school children in distributing pure seed?—Yes, it all went with their system. The school was a distributing agency for better seed.

38,648. Do you think that it would be possible to use Indian boys in the same way that Canadian boys are used to get pure seed distributed?—Yes, I do. Sir Selwyn Fremantle when he was Collector of Allahabad actually began it. He was so keen on this that he gave to every rural school a plot of ground with a well and a fence; he sent his teachers for training, and he procured better seed and better implements, and altogether I must say that he was making real progress until he was transferred and there was no more interest evinced in this. That is one of the difficulties in India. Instead of his being promoted to Lucknow, if he had been allowed to stick at that one job and work it through I think myself that he would have made a real contribution to India greater than he made after his transfer, an advantage which was lost because his successor was interested in other things which may have been just as valuable. But there is no doubt that one tragedy of India is these half-completed, broken-off schemes which you see everywhere. That is why we, if I might say so, promise more of continuity at our one job than Government.

38,649. To pass from Canada to the Southern States: is it not the case there that great use has been made of the boys' clubs?—Yes, boys' and girls' clubs.

38,650. That is under the States Relations branch of the Federal Department?—Yes.

38,651. Do you know whether the school plot is used in the Southern States for any other purpose than that of habituating boys to farming operations? Is it used as a means of general education? I have heard that it has been used to teach boys arithmetic and figuring up accounts?—Yes, the boy learns that; he knows what he is doing. He does the whole thing himself and knows exactly what he has done, how much time he gave to it, what the cost was, and so on. I think that is one of the finest educational methods ever devised.

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38,652. And the system of education has been devised especially in view of the conditions prevailing in the Southern States?—Yes; of course, the same thing has been done in the Moga School in the Punjab. Then there is also a school at Moradabad under Canon Crosthwaite where something of the same kind is being done with village boys.

38,653. Then you remark that Indians must have the same chance of technical training as has been given in America and in other countries. When did America begin to give its technical training in Agriculture? Was there anything much done before 1864-65?—(*Professor Gangulee*): It began with the Hatch Act, I suppose?

38,654. *Sir Thomas Middleton*: No; it began with the land grant colleges. The point is this, the land grant colleges were started about 1864, and the Hatch Act came along in 1888. Was any considerable progress made in that period?—It is a very long time since I studied that, but if I remember aright there had been very little progress made in those years.

38,655. Practically none?—Yes.

38,656. The Hatch Act introduced the experimental station?—Yes.

38,657. And also research?—Yes.

38,658. And after the Hatch Act had been at work for some years then agricultural education got a real start?—Yes.

Professor Gangulee: Not until the Smith-Lever Act came into operation in 1914.

38,659. *Sir Thomas Middleton*: So that the movement became active from the time that the Hatch Act was passed. There was a period during which the American teacher was gaining experience and technical knowledge for himself, and it was only after he had got that technical experience that he was able to teach effectively, and your institutions have really become effective teaching institutions in the present century?—Yes.

38,660. And India is now passing through a similar period?—Yes.

38,661. But in its development it is a certain number of years behind the United States?—Yes, I should think it is ten or fifteen years behind the United States.

38,662. Would you agree that, before we are able to give the Indian the training which has been provided in the United States for its own subjects, we must have a well-developed system of investigation?—Certainly; and the encouraging thing about it is this, that the small amount that has already been done has produced marvellous results. Take the results at Pusa up to date, and also the results here in Cawnpore. The results are filtering down to the cultivator who is ready to-day to accept things that he would not have accepted ten years ago. The problem now is to take these results and place them before the farmer in the villages, and to get him to follow these improved methods.

38,663. You say on page 541, "The modification in the existing courses of study which appear to be called for is to make them less technical and scientific and more practical"?—Yes, the tendency nowadays is to turn out men who simply obtain a theoretical knowledge of agriculture, men who are very brilliant in the laboratory, who might be called stars, but in the actual field they would not know how to use a plough.

38,664. I quite agree with you there. What I want to put to you is this, whether, while the courses for ordinary students must be practical in character, the teachers who give instruction must themselves have had a very full training, just such training as your American teachers now get in American institutions?—Surely: the simplest village education will prove a tax on the best trained man in India.

38,665. How long do you take to train your teachers in the United States for work in agricultural colleges at the present time?—Very few teach with less than seven years of undergraduate and post-graduate training. You may get a man taking on a job as an instructor during his degree course in order to earn a little money, but there are very few men of this type who do not go on and take the Doctorate. The agricultural college teachers generally have four years of undergraduate training and almost invariably three years of post-graduate training.

38,666. On page 543 of your memorandum you say "The agricultural literature costs too much. The price should be nominal, or be given free upon request." I think in making that suggestion you are advocating the policy which has been adopted in the United State?—And Canada. I think Canada is more generous with this literature than the United States. I say it should be free on request. I do not mean to say that this literature should be published just for the sake of the department and then used in the bazaar for wrapping up sugar and tea. For instance, I want certain things on dairying; it is impossible to-day to gather a library of Government publications on dairying in India. Anything that is good is mostly out of print. Once I sent for a book and I had to pay Rs.6. I think a mistake was made because on the publication itself, a leaflet on the milk problem of Bombay, the published price was 3 annas, but that cost me Rs.6-14-0*. Suppose there is a young graduate from this dairy training school who wants to start a dairy somewhere and he wants to get everything that is published in India on the subject, it is difficult for him to get it. The books may be out of print or the expense may be out of proportion.

38,667. And sometimes a great deal of labour is taken in preparing leaflets for publication but they do not reach the people they are meant to assist?—Yes, they do not reach the people. I think every University library and every school library in the rural areas should have all such agricultural publications and there ought to be a trained librarian who could point out to the students and talk of things when they come in; there is very little done at present in this way to stimulate interest.

38,668. You point out the way in which the Meteorological Department fails to meet your needs. For example you say they do not give frost warnings as they do in America?—Yes.

38,669. My point is, do you think if our Meteorological Department in India undertook to give frost warnings there would be any chance of adopting the methods which are commonly adopted in the United States for combating frost?—Yes; such a warning should be put up at every school house or any other public place and the farmers would get to know it as they pass along. If the village farmer knew the frost was coming he would irrigate or smudge fire; but he does not know when the thing is coming.

38,670. You think cultivators would smudge?—Indeed I do. If they were told about it they would smudge in the four corners of the fields or in the *arhar* patches; I think very little teaching would be necessary for that; once they grasp it they would take advantage of it.

38,671. *Raja Sir Rampal Singh*: On page 541, in your scheme of agricultural education you suggest that "there should be in every district a centralised school with a farm to which the best of the boys should go at the age of about 14 and stay until they are ready to enter college or go to work to earn their living." In what language should the training be given to these boys in the centralised school?—In the local vernacular.

* The witness subsequently received a refund of Rs.6 from the Post Office.
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38,672. In the college which you have in view should the education be in the vernacular or in English?—That would be for the educational authorities to say. In India, I take it that in the college there should be teaching in English; the Indians themselves want it. Most of the Indians of my acquaintance regard any system of higher education that does not teach English as walking up a blind alley. I take it that in the centralised school the instruction in farming matters would be given in a language that the boys could understand, but as preparatory to college I take it that English would be one of the subjects taught. That is why I speak of the centralised school; the small village school could not prepare for the college. But in schools where you could get the best boys you could concentrate on good teachers and you could put in a Professor of English.

38,673. With regard to propoganda you say that literature on agriculture should be free. Is there any literature in the vernacular of the Province which could be helpful to the agriculturist in making agricultural progress? Is there any such literature in the shape of books or journals or anything else issued by the Agricultural Department in the vernacular?—I believe there is. There are some medical books on sanitation; and I think there are instructions in the vernacular for the growing of certain crops. I am not absolutely sure about that. But if there are not any in the United Provinces Government, there are in other Local Governments and in some of the Indian States. I was thinking there not only of literature in English for the educated man but I was thinking of a pamphlet which could be read aloud by the schoolmasters to the farmers. I do feel that we are not having any good literature in the vernacular for farmers for instruction in various farm matters. I am in favour of a good deal more than we are doing at present.

38,674. There is a lack of such literature in this Province as far as I know. You say on page 540: "The great difficulty with most education given in Indian rural schools is that it has been prepared for the city boy"?—That is my experience. Not only that, the teacher in these village schools is often very proud that he cannot distinguish one crop from another when he sees it in the field. I have gone to some of the village schools in the United Provinces and asked a teacher what a certain crop was and he did not know what it was and seemed proud of his ignorance. What kind of teacher is that for a rural school? The whole bias of the man and the background of his mind is against what the boy ought to be learning.

38,675. So in order to bring about some improvement it will be necessary to recruit teachers from agricultural classes who may be in touch with the rural life?—If you cannot get agricultural classes to be educated I do not care what class he is from if he knows agriculture and loves it and likes to teach it; that is my point. Sometimes the agricultural classes have a very strong determination not to be educated and you cannot force those people into the schools to get training. But I do not care what class he comes from if the teacher is properly trained in agriculture and properly trained to teach it and that man would be better than the present average man in the village school.

38,676. What is your opinion about this Agricultural College at Cawnpore? Does it turn out persons who could take up farming?—I think it is very much better than it was; I think it is working towards that, but it was not started with that idea in mind. It was started as a departmental institution; it had no relation with the Education Department; but I think it should be turned into a first class agricultural college properly equipped and staffed for degree work. Now there has been a talk; some of the officials very high in Government service say that there is no room in this Province for two agricultural colleges offering degree courses. I have never heard of anything more preposterous than that, that two colleges are too much for 50 million people where a majority are farmers. There

is room for two, and if both are doing their best they are bound to stimulate each other. The trouble in most of the Government institutions is that there has been no competition at all. The staff could loaf on the job and there is no way of dispensing with them; if there are two institutions, there is room for both to do their best.

38,677. You told us that you were not getting any aid from the Government; did you apply for that?—No; I did not. The Mission under which I was working refused to accept any grant from Government because of the conscience clause; but there has been a reorganisation of the Agricultural College, and at the last meeting of the Board of Directors I was authorised to apply to the Government, and I am now asking for a grant. I am about to ask a lakh a year for three years non-recurring for our intermediate and dairy courses. If we become related to the University I am asking the University to give 2 lakhs non-recurring for hostel, laboratory and equipment, also the Government to give us Rs.25,000 a year to help us to pay our Indian staff for the Intermediate College and the University again to pay us Rs.45,000 a year for the degree courses. We to-day are putting about a lakh and a half of rupees annually into it from America. Our total contribution from America is about 15 lakhs pledged or paid in.

38,678. *Sin James MacKenna*: Where do you recruit your students from for your institute?—They come from different Provinces; we have got a good many Punjabis; the dairy course attracts them from all over India. We have had a number of students from Fiji Islands; we got them because the English Wesleyan Missionaries sent them here. They sent six boys, and most of them did remarkably well.

38,679. Are they limited to the members of the Mission or is it open to the general public?—The majority of our students are non-Christian. We never make any difference.

38,680. It is an open institution?—It is an absolutely open institution.

38,681. Have you any organisation for demonstration?—No; we have very little; it takes men and it requires money. We are concentrating on meeting the requirements of the educational authorities; it is our primary business to teach; but in the next few years we do hope to build up an Extension Department as we call it; for instance, we have just been asked by local fairs to send cattle and ploughs and other machinery and demonstrate, and we have had to refuse because we had sent out all we could spare of things and cattle down to the *magh mela* exhibit; that was held in conjunction with the Allahabad District Board and the Local Government Department of Agriculture. The *magh mela* is one of the most profitable places for doing it. A great number of people came there; the Government put up a sugar making demonstration; our Agricultural Institute put on the dairy side of it, making butter and *ghi*, and churning and so on, and sent our best Jersey and Brown Swiss bulls. I wish we were in a position to respond to the invitations we get; but unfortunately through no lack of willingness but owing to lack of finance and staff we cannot do much. You cannot get a man out from America nor can you take an Indian and send him, without any training, to give a demonstration. He has to undergo years of apprenticeship and preparation. I think a man to be successful in this field should have a longer apprenticeship than a doctor even.

38,682. If you have a demonstration *vis à vis* the local department there will have to be some working agreement?—Yes.

38,683. For defining areas probably?—I have not taken that matter up yet. There is another thing; we are invited from outside the United Provinces.

38,684. You do not anticipate any difficulty in setting up an organisation when you are ready to demonstrate?—No; there has always been the heartiest

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co-operation with Government; I do not anticipate any difficulty; they are just as keen on it as we are, but very frequently they are hampered in much the same way as we are; we both recognise that it is a good thing, but we cannot do all we would like owing to limitation of resources.

38,685. Do you think you are having any more success than Government in getting students to come to you who want to study agriculture with a view to going back to the land, or do you find that the bulk of the students want Government jobs?—I think we have an advantage in some ways over Government; if a man wants a Government job he usually goes to a Government college, because our students, rightly or wrongly, have an idea that if they are trained with us they are not as welcome in Government jobs as they would be if they went to a Government college, so that I think we get more of our men looking to other than Government posts. But that is nothing to our credit; if they thought there was a better chance of a Government job with us than in a Government college, they would flock to us.

38,686. *The Chairman*: Very few of the students shown in this list appear to have gone back to the land?—Several Missions want to start agricultural training and teaching, and they use our men. We have a Medical Missionary who has taken a survey of all our orphanages and schools, and he finds that every child under 10 is under weight and under-sized, suffering from malnutrition, while the children over 12 are all up to weight. He being a medical man, says that this uniformity of under-weight below a certain age points to the fact that these children are being fed on an adult diet. So he started a programme among the Mission schools and orphanages for what he called: "More cows and cabbages." The result is that many of the schools have put in gardens and cattle to provide the children with fresh vegetables and milk, and use the men trained by us. A great many of our people are working on the land for Missions and teaching in that position. That is what I meant when I said that in the early part of this training most of the men will go into teaching positions, and later on they will go back to the land; we are merely repeating the experience of Canada and the United States in that respect.

38,687. *Sir James MacKenna*: In reply to Sir Henry Lawrence, you pointed out the great difficulty of getting adequately trained Indians for the posts you are trying to fill in India. Have you ever considered the possibility of developing Pusa as a higher training institution?—Yes, it ought to be. I have been to Pusa a number of times. Our difficulty is that, if a man has been to Pusa, he is not willing to work on the salary we can offer him; we live on a missionary salary and we are not likely to appoint people on double the salary we are receiving.

38,688. But apart from that difficulty peculiar to the Mission, do you think Pusa should be developed as a post-graduate teaching institute of a high standard?—Yes, except that it will not be enough for the whole of India. Everyone of the present colleges should be developed for post-graduate work.

38,689. What is your general view of the efficiency of Pusa? You have visited it frequently, I know. What is your view of the work done at Pusa?—I was invited by the Agricultural Department of the University of California to make a statement; they welcomed me as coming from India, and I said something about the great outturn of high grade work from Pusa coming from such a small body of men. The Dean of that College, which is one of the greatest agricultural colleges in America, said: "I bear out Mr. Higginbottom; he is not exaggerating; we regard the Pusa bulletins as among the best that come to us." I frequently had luncheon with members of the agricultural faculties in America, and they all seemed to have a very high regard for the research work that was done at Pusa and in India generally by the Agricultural Department:

in plant breeding, Howard's work, Hutchinson's work especially, Dr. Barber's work on sugarcane, and the work of Lefroy when he was at Pusa. These and other men and their work are very well known in America.

38,690. So that Pusa has no cause to be ashamed?—No cause to be ashamed at all.

38,691. What do you think of the Board of Agriculture? You frequently honour us with your presence?—I think it is a most useful body doing most useful work. It is a piece of propaganda, but it is more than that. A great danger in India for scientific workers is that of isolation. I always find that I am well paid for attending these Board meetings, not merely by what I get in the formal meetings, valuable as that is, but also from talking quietly with the men who are working on the same problems that I am. It is the informal discussion among these men when they get together for a number of days that is the Board's most valuable contribution.

38,692. Have you attended any of the sectional meetings that used to take place; that is, meetings of Botanists, Chemists and Entomologists?—I have only attended the sectional meeting on cattle.

38,693. Do you think it is a good development for the Board to work in smaller units on particular subjects?—Yes, I do, though I think you need both.

38,694. One could supplement the other?—Yes.

38,695. Sir Henry Lawrence put to you a question about non-American scientific workers in American Universities, and you could quote one instance from Canada. Is it not the case that in another branch of science, theological science, there is a very considerable importation from my country?—Yes; my own University has had half a dozen; Mr. Bowman has just returned to Scotland after teaching in Princeton for a number of years; there is also Professor Thompson. America has had a number of Oxford, Cambridge and Edinburgh men. In other than agricultural fields American Universities draw very largely on foreign countries. I know of Indians teaching in American colleges.

38,696. I think Sir Henry was asking about that general principle, that in getting men in any branch of science America takes the international view?—Yes, that is so. You would have difficulty in finding a large American University that was staffed only by Americans; there are men from France, Germany and Austria: in fact, men of all nationalities. The American Universities are looking for the best, and they do not care much what country they have to go to if they can get the man they want.

38,697. Have you had any direct assistance in the development of your Institute from the Imperial departments in regard to cattle breeding, dairying, improvement of crops and so on?—We have had no financial assistance; we have had their advice in a number of things.

38,698. I think you consult them freely?—Yes, I have never hesitated to consult them.

38,699. Has the Imperial Department been a distinct help?—Yes, it has to us. Then, of course, we read all their publications; this latest report from Pusa on their work on sugar immediately interests us. I may say it has led to the writing of several supplementary letters because that report was not full enough to meet what we wanted, but it told us where we could find what we wanted, which was an important thing; we knew we could get it at Pusa.

38,700. You have probably been following the evidence that has been given to this Commission and may have noticed under discussion the idea

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of a Central Agricultural Board assisting the research in the Provinces. There was a leading article in *The Pioneer* some weeks ago on that subject?—Yes.

38,701. Have you considered the advisability of a scheme of that kind?—I have not only thought about it, but some years ago I wrote to the Agricultural Adviser at Pusa urging the necessity for some such thing to act as a co-ordinating and distributing agency; it would have two functions.

38,702. Is the central body to have a staff of its own available for particular work in a Province?—I find a difficulty in going into details; I think it has to be worked out as it goes along. It may be I am an opportunist in my philosophy. I cannot lay down all the details, but we need the men and we need such a body; we have not got it to-day. A man may be working in isolation not knowing what another man is doing and he may waste years of his life; whereas if there were this co-ordination and distributing body he could get the information he wanted and save public time and money.

38,703. I know you have been interested in economic questions for many years; have you any idea how we are eventually going to get down to the small cultivator, the one-yoke man? The Agricultural Department is rather apt to look after the big man, but the man we must eventually get to is the small man?—We must use the village school and demonstrate in the village where he lives. The report of the General Education Board of the Rockefeller Foundation is the thing to follow; it has succeeded marvellously. The late Maharajah of Gwalior had adopted that system. Sir Selwyn Fremantle had started it in the Allahabad District. If we continue that system for a few years, I think you will find we shall get down to the small man. When you get down to him, you will find that your problems are not problems of agriculture; they are the problems of protecting him from illegal exactions of all kinds and securing to him the due reward for his toil. Before I left I said to the Maharajah of Gwalior: "You have got good land, you can grow as good things here as in any place on earth, and yet 650,000 acres of your land, which is as good land as God ever put anywhere, is lying fallow because no man who goes on to it has any security." Of course, we get back to a moral issue, right between man and man.

38,704. *Professor Gangulee*: On the question of co-operation between the Imperial and the provincial research departments, I think in answer to the Chairman you referred to the Smith-Hughes Act of 1917 in your country. What is the chief object of that Act?—I am afraid it is a good many years since I looked it up. Generally, as I understand it, it was to provide demonstrators to go into villages where it was felt that they needed agricultural betterment; it was for the adult farmer, for the man actually face to face with his problems.

38,705. The chief object, I think, was to give a federal stimulus to the different States?—Yes, but for a particular object.

38,706. I think you have a special bureau called the States Relations Service?—I am afraid I have not studied these things for a long time and my mind is hazy on them.

38,707. That Service, I understand from a note given to us, was a connecting link between the Central Government and the States; do you think such an organisation is feasible in our conditions in India?—Yes, I think it is not only feasible, but we ought to have it.

38,708. In your note under the heading of research you seem to suggest that sufficient official encouragement was not forthcoming?—I hope I did more than suggest. Where are some of the best men in India to-day? Why did India let Lefroy go? Why did India let its best men go? They went

elsewhere for better pay; you cannot blame those men. There is another thing: I know there are great and fine lawyers; I have nothing against the legal profession as such, but frequently when the Agricultural Department has made requests I have known these men holding office to say: "I know nothing about what you need for agriculture, but I know I will not give it." When a great public department is face to face with that attitude on the part of its officials at the top, what can the department do? You break the hearts of your best men, whether they are Indians or British, by asking them to work bare handed.

38,709. You say you are not in favour of veterinarians having charge of animal breeding in India. Can you tell us what is your reason for saying that?—Well, they made such a mess of it. I would have the animal breeding in charge of an animal husbandry man. You do not get a veterinary surgeon to breed your racehorses in England. For instance, in these Provinces a few years ago the Government were advocating a certain breed of cattle, the Kheri cattle. I do not believe any female of that breed was ever known to give a calf before it was five years of age, and the bulls were not mature until they were six. Who wants to keep an animal five or six years before it begins to give any return? The veterinarian had chosen this animal because it came nearer to subsisting on nothing than any other animal in the Provinces, which means that it was furthest removed from domestication; it had less qualities desired by man than any other breed of animal in these Provinces, but, because it could survive when everything else died in a famine, it was chosen. That is the sort of thing I have found likely to happen. The veterinarian has an entirely different object from that of the animal breeder. I want a cow that will give a lot of milk, and I am ready to protect that cow while she gives it; I want a bullock that can work, and I am willing to protect him. That is what I mean by domestication.

38,710. You refer to the demonstration work done in the southern part of the United States; I think you are referring to Dr. Knapp's work?—He was the beginner.

38,711. Do you think that method of demonstration could be adopted in this country?—Yes, it was the object of the late Maharajah of Gwalior to adopt that method in his State.

38,712. Are you familiar with the methods of demonstration adopted in the United Provinces?—I am sorry to say, not recently; I have just returned from furlough; they were opening demonstration farms.

38,713. You have been in this Province for twenty years?—Yes.

38,714. You know something of the methods adopted?—I know some of their methods; they vary very much. It is the personal element that counts. I know men in these Provinces who have done splendid work, of which any Government department might well be proud; I know other men of whom it may be said that it would have been a good thing for everybody if they had retired young.

38,715. Are you in favour of demonstration on the farmer's own land or on demonstration farms?—You need both. From the demonstration farm you must be able to guarantee a supply of pure seed, and then from that demonstration farm have your staff going out into selected villages where farmers on their own land try to repeat those demonstrations. But in India especially, more than in America, I think the demonstration farm is necessary and is very useful if it is managed in the right manner with the right man at the head of it.

38,716. Would you attempt to run demonstration farms on economic lines?—What do you mean when you ask that the farms must be run on economic lines?

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38,716a. They must be self-supporting; they must pay for themselves. I use the word economic in its real economic sense.—I do not mean that they should make a profit. I mean that they should be run economically, with the best book-keeping methods.

38,717. We were told that most demonstration farms in the Province were paying?—Then I doubt their value and I doubt their book-keeping too.

38,718. In the United States there are a number of County Agents who are entrusted with the duties of demonstration and distribution of literature and of things that concern the welfare of rural population. Do you think that in this country there are possibilities of having such men?—I do: that is part of the scheme surely.

38,719. Men of what calibre would you have for such work? Men well trained in agricultural colleges?—Certainly; not your recent graduates. The man must have had anywhere between five and ten years of experience. It would be an awful thing to send a recent graduate to try his mistakes on the poor villagers in the countryside.

38,720. You would have, first of all, a man who was trained in an agricultural college; then you would have such a man who had had five to ten years' experience?—Yes, possibly teaching on one of your demonstration farms or in the college; but only a man of approved fitness.

38,721. What would be his duties?—He would have to cover the whole field of rural life; it is the man we want to improve. We know of course that we cannot improve him unless we can give him a bellyful of good food once in a while.

38,722. I think you have in the United States of America a service called the Rural Service? Do you think you can have such a Service in this country, a service from which you recruit your county Agents?—That really embraces the whole field of rural life; it is really too big a job for any one man to be able to advise one fellow on the best kind of beef cattle and another on dairy cattle, and all crops on all soils; but get your one man going first and then follow the light of experience.

38,723. I have one or two questions to ask you with regard to your Institute. When you say that there is no definite, well thought-out programme for rural education, do you mean to suggest that hitherto in India we have not had any definite scheme drafted?—I have seen lots of schemes, but I have never seen one that worked out according to the way in which the man who designed it intended it to be worked. I know that Dr. Mann has a school, and I also knew that there is a school at Bulandshahr, but the men in charge at those schools do not claim that they are doing what they ought really to do.

38,724. Have you visited the Bulandshahr School?—Not recently; four years ago.

38,725. Would you attempt to teach agriculture in primary schools?—How are you going to define agriculture if you mean to give each child its own garden plot as they have done in the Phillipine Islands? Of what age are your primary school children?

38,726. In this country they are from seven to eleven years of age?—At home such children would help the *chaukidari* and collect fuel and do things of that sort. They might learn things in the garden; but to say to teach formal agriculture, you need a little elasticity there.

38,727. Your success in the southern part of your States is chiefly in your secondary rural schools, and not so much in your primary schools, I take it?—They were children who did not get to the primary school stage till they were nine or ten years of age.

38,728. Do you think that there is a demand for special agricultural schools in this Province? You have one such school at Bulandshahr?—

I do not know that there is a demand, nor do I know that there was a demand for them. But I know they are needed.

38,729. Then would you have agriculture taught in the ordinary middle schools? Is that your idea?—I would have agriculture taught in every rural school in the Province. I know that that is a counsel of perfection now because you have not got the teachers, but that is the ideal at which I would aim. In every rural school I would introduce the school garden scheme which Sir Selwyn Fremantle evolved.

38,730. In your own institute work, in your teaching work there, do you use the results obtained by Government farms and stations in this country?—When I have been asked what we are doing there I say that we are teaching agriculture and demonstrating. We do not have the equipment for experiments, and anything in the nature of experiments is a side-issue with us. We do definitely set out to know the best that the department has found out from its experiments and we teach that.

38,731. Do you charge any fees from the students?—Yes; for the diploma course the fees are Rs.10; for the other courses the fees as Rs.6.

38,732. What salaries do you give your teachers?—The Missionaries are all under a missionary allowance. Then there are Indians who are not being paid quite as much as I would wish. Mr. Mulchand is getting Rs.2040 a year; Mr. Halder, Rs.1800; one gentleman is getting Rs.2325, and Mr. Sud is getting Rs.1720. But these men are not getting the salaries which the Government institutions would pay. I wish we were in a position to pay them more.

38,733. You refer to the agricultural literature that is produced in this country. What is your view on the quality of the literature that is produced?—It is valuable; some of it is very good indeed.

38,734. I am not referring to the Imperial literature, but to the Provincial publications?—Yes, I say that some of it is very good. I do not, of course, know very much about all of it.

38,735. Your Institute is not affiliated to the Allahabad University?—No; but I hope it will be. It is teaching a course now under the Board of High School and Intermediate Education. It was a fight of years to prove to the educational authorities that agriculture was at least not negative educationally.

38,736. You told us here in this note that the Government Military dairy farms could be used as educational institutions? Have you any definite idea or scheme as to how that could be done?—They are the best dairies in many ways in India. If they had the money and a degree of continuity they would do very well indeed. At Allahabad Major Meagher, who started it, built quarters for students and in the earlier days they did train some men who did very well. You could have two kinds of training; you could bring in ordinary *gowala* boys and give them a short course, showing them how to produce clean milk, how to feed their cattle economically and so forth; it would be strictly practical. And then again I think that every Government Military dairy in India should train ten students a year; this would be a very good thing indeed.

38,737. Regarding the question of rural education, you say that rural education in rural tracts can be popularised if it can be proved that it pays financially. I suppose you want rural schools to pay for themselves, to be self-supporting?—What I meant by that was that the boy who gets this education should be worth more in rupees than the boy who does not get it, and that has not yet been demonstrated.

38,738. In answer to Sir Henry Lawrence, I think you mentioned something about prisoners being trained in the jails. Do you know of any prisoner who, as a result of his training in the jail, has adopted any improved methods of agriculture after coming out of the jail?—I did know

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a good number of them a few years ago who went out from the Naini jail and did this in their villages.

38,739. I saw Colonel Hudson's work in 1906-07, and my impression was that no systematic agricultural training was being given in his jail?—There was no continuity in the work; it was just Colonel Hudson's personal interest in such work, and of course you will agree that you do not find many Colonel Hudsons unfortunately.

38,740. Have you closely followed the research work of the Province?—I am now at a disadvantage in having very recently returned from furlough. But up to the time of going on furlough I did follow the research work of the Province. I felt that in Mr. Leake's work in cotton, Mr. Clark's work in sugarcane and Dr. Parr's work at Aligarh, that the Province had something of which it might very well be proud.

38,741. You have known the Province for twenty years, I believe. Do you observe any change in the standard of living amongst the cultivators and the people?—I think that they have a little more, but not very much.

38,742. You do not see a distinct rise in the standard of living?—Not very much. In the villages they still eat raw *bajra* and have a minimum of clothing.

38,743. Is that largely due to the enforced idleness of both man and beast?—I think so; they are in the long run paid an economic wage, and if they work only a third of their time they only get paid for a third of their time.

38,744. *Mr. Calvert*: You have seen Moga, I presume?—Yes.

38,745. Do you think very much of value could be learned at Moga by other parts of India?—I do: I do not say that Moga is perfect; it has got a lot to do yet, but, when I first saw and got acquainted with it, I thought it was a most valuable contribution to India at that time.

38,746. You put forward the suggestion of having a properly qualified teacher at every school, but in your teacher's course you do not, apparently, include co-operation?—In practice we do; I am very sorry if that is omitted; it is taught. No student gets out of our institution without some knowledge of co-operation. I think I have said in my evidence that this is the most valuable handmaid that we have.

38,747. Do you attach importance to inquiries into rural economics?—Very great importance, because, so far, we have been walking in the dark. When, at the Board of Agriculture meetings I talk about the conditions of the villages around Allahabad, for instance, the other men look at me in amazement; and then when they talk about conditions in their part of the country, round the villages, it causes me to look with amazement at them.

38,748. Do you think they might prove useful as guides in directing agricultural policy?—I think they are doing so. That is our greatest trouble; we know so little about village life, and if that were not the case we would not be having this Commission sitting here to-day and making inquiries into these matters.

38,749. We ourselves have not yet been able to get at the economic facts with regard to agricultural conditions in the Province. Have you noticed any lack or insufficiency of such knowledge among the officers of the Agricultural Department?—I am not sure of your question.

38,750. Have you found that officers of the Agricultural Department are somewhat lacking in knowledge of economic conditions?—Yes. They have been trained all on one side, and frequently it seems to me that they have had very little training in economics.

38,751. Do you think there is much scope for horticulture, fruit and vegetable growing in these Provinces?—Yes, there is very great scope. I believe that there are very great potentialities in this direction in India, and if the question is tackled in the right way there is great scope for displacing all the imported stuff. We have a veritable goldmine at our very feet here, but, unfortunately, we have not yet been shown how to exploit these resources. We have not studied the problem, and once we master it we can compete with the other fruit markets of the world. At present California and Florida are looked upon as the world's best fruit gardens. To my mind there are much the same possibilities in India. Take, for instance, the guava; the best guavas are to be got at Allahabad. Supposing you buy a dozen guavas from one dealer, the chances are that you will find almost a dozen different varieties among that lot, because they have never been sorted out. Then, again, I have eaten oranges in the Punjab which I considered were as good as those we get in Florida or California, the only places which can surpass them being Damascus and Palestine. As I say, we can grow marvellous varieties of fruit in India, but we know very little about fruit growing. We have not learned yet how to protect fruit against wild animals, nor against insects, and other diseases, so that as soon as they are attacked by any insect or fungus disease the whole lot of the trees and groves are in danger of being wiped out. We have a whole-time man from America on fruits and vegetables. So important do we regard it.

38,752. *Professor Gangulee*: You are paying more attention to guavas?—We are trying now to sort out the guava. Our man has several hundreds of seedling trees planted. He will sort out those trees and then he will choose the early maturing varieties, the late maturing varieties, and so on, for other desirable qualities and characters, and then will multiply them and establish a standard variety of guava, something that has not yet been done.

38,753. *Mr. Kamat*: We are told the demonstration farms in this Province are almost invariably self-supporting. As an experienced agriculturist, do you regard this as a sign of a sound policy and that there is no air of artificiality about it?—I have no way of going behind the records. I have just to take the things at their face value. I cannot say whether these demonstration farms are paying or not; I would have to study the accounts to see how the interest charges, depreciation and all those things are met. But I do not regard it as essential or desirable that a demonstration farm should be profitable. Its function is not that.

38,754. So that assuming that the Local Government have issued departmental orders that every demonstration farm must be self-supporting, that policy you would not regard as sound?—I should regard it as based upon ignorance.

38,755. *Professor Gangulee*: It was done by the Minister?—Supposing it is laid down that the public gardens in Allahabad must be self-supporting, how can they be? There are public gardens which used to be the most beautiful spots in Northern India; now the cows are grazing on them. It needs a little sense. If you simply say that a great public park should be self-supporting, how can it be self-supporting anywhere on the earth? There is a park in Allahabad and I used to go there with my family to hear the band on Saturday afternoons. They said that the gardens were kept mostly for Europeans. But by actual count on repeated Saturday afternoons I found that for every European or Anglo-Indian there used to be twenty Indians who were enjoying it. I used to go there for the beauty of the place and I gloried in the Indians' good sense in going there; but that day is gone because of the so-called but misnamed "economy."

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38,756. *Mr. Kamat:* Now about the policy of these schools such as the one at Bulandshahr or the Agricultural College, your experience is that the courses in them are not practical?—There is an element of practicalness there, but we want more. True we have to pass the bar of the educationists. Teaching chemistry, they talk about “pure chemistry” and “pure science” and that sort of stuff. Now we farm teachers have got to give a man enough chemistry and enough biology and enough economics and so on to use in his every day farming. They are not ends with him; they are means, and we want to give him enough of those sciences so that he will understand the principles in all his work. But the main emphasis is on teaching him to grow crops for profit.

38,757. Exactly. You said that you were not quite sure whether Dr. Mann's syllabus was right or whether the Bulandshahr course was right. I would like to ask you, are you quite sure that on your own farm every boy turned out can make agriculture profitable as you say?—No. We are not teaching the course we would like to teach; we are not getting the whole loaf; we are getting half a loaf and we hope to get this agricultural course in the next few years to be the kind of course we want.

37,758. And you would solve that problem in the course of a couple of years?—I dare not be so optimistic.

38,759. Say five years more?—We hope to do it gradually, and that is one of the benefits of having Cawnpore working with us.

38,760. The question of time is not the essential thing?—No. We hope to get a course in agriculture so that the average graduate will do the job for which he is trained. It is not every man who goes through the law school that makes a successful lawyer, nor does every man who goes through a medical school practise medicine; a great many fall by the wayside. We will have the same thing in agriculture; but we are thinking now of the majority. Now in the short time we cannot give him enough practical experience. What they do in a medical school is to make the student work in the hospital before he has finished the course and we want something like that in the agricultural course.

38,761. You are confident that in the course of five or ten years your course would be made profitable for the middle-class man as against the course which is now taught in the agricultural colleges?—I would like to make this modification: the man with that training should then, if he is of average intelligence and industry and energy, be able to make a living on rented land; he may not necessarily own the land, but he can rent 20 or 30 acres or more and he should be able to make a decent living on it.

38,762. Do you mean to say that if the Government Agricultural Colleges pursue their present course they cannot make agriculture profitable even in twenty years?—No; I am not complaining of the course in the Government Agricultural Colleges. It is the educational authorities that overload the course with science. The University adds on chemistry or biology as though science were the major and not agriculture. The university chemist knows that in his Chemistry Department is laid down a course in chemistry for a man who is taking the subjects as his main course. He thinks thus: “I know how important chemistry is. The farmer must get as much chemistry as the man who is going up for the B.Sc. in Chemistry.” That is the thing I complain of. It is not that our courses are better than in the Agricultural Colleges. The problem of agricultural education in India is so new that the educational authorities in general have not been quite able to realise its importance for its own sake.

38,763. The whole problem of agricultural education either in Government institutions or in private ones like yours is this, that sooner or later the boy turned out must be able to make agriculture profitable?—That is it, yes.

38,764. If you think that the present Government course is not suitable, have you any definite suggestions to make, whether to cut down that course from four years to something less or lengthen the course?—You should not cut down the course. Four years at least for the college.

38,765. You want a longer course?—The longer course is what we want, more training, not less.

38,766. More practical training in the field?—Yes, and in dealing with cattle and various other things. We must recognise that it is utterly impossible to train any one man to be a first-class general farmer and a first-class animal husbandry man and a first-class horticulturist, all in one. A man must specialise in one or the other line in agriculture.

38,767. Regarding cowdung and the supply of fuel you make a statement: "There is enough waste land along paths or roadsides where quick-growing trees could be planted so that almost every village could have an abundant supply of wood for fuel." I am not convinced if every village in India would have an abundant supply of wood for fuel by the planting of trees on waste land as you suggest. Would you explain it further?—Now how much fuel does it take to supply one family? Remember this, that because of the insufficient clothing of the villager his fuel requirements are much more than would be the case if he were properly clothed. What these villagers do in the cold nights is the whole village sits round and burns the leaves, cowdung and other organic matter they find around. They have not clothing enough and so they burn everything that could be turned into manure. But I still hold to my opinion that, in most of the villages I am acquainted with down round Allahabad, a careful policy of growing fuel woods like babul would make the village practically self-supporting in the matter of wood for fuel.

38,768. It seems to me you are concentrating your eye too much on the northern part of the country where the question of clothing chiefly comes in. Down in the south, in Madras for instance, where the climate is warm, very little of clothing is necessary, but the chief difficulty is about fuel for cooking purposes?—It is one of the problems that is always in my mind. Fuel is a thing, whether wood fuel or cowdung fuel, which will not bear the cost of transportation. So it must be produced nearby. The problem could soon be worked out. You could take a village of, say, 30 houses, with an area of 150 acres round about. There is the question of how much land would have to be laid aside to grow a sufficient amount of fuel for that village; the difficulty is in getting the work started. In three or four years the tree will be sufficiently grown for fuel; the question is what are they going to do in the meanwhile; but I think the thing can be done.

38,769. I hope you would make a trial and solve this problem of fuel in India?—We have done it for our own place.

38,770. Have you made observations regarding the position of the villager in relation to the moneylender?—When I was in Gwalior I did a lot of that and I was appalled at what I found there.

38,771. We have had no opportunity yet of examining moneylenders or their representatives or to ask them their point of view or their disabilities or any other such matter; but have you heard of any difficulties such as law's delays from the moneylender's point of view?—The moneylender is a necessity in rural economy.

38,772. *Mr. Culvert*: He is a necessity at present?—Yes.

38,773. *Mr. Kamat*: And the question is how to improve him?—The question refers, does it not, to the legitimate moneylender lending money at legitimate rates of interest? The moneylender's answer is that these

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rascals are so insecure and they play so many tricks; and so he has to charge up to 150 per cent. per annum and there is no other way out of it. That is one of the most difficult problems that we are faced with in India. There are also other illegal exactions by the moneylender. Frequently he will not give a receipt for the money he receives. I have asked a man, "You have paid your money, what has he written?" and his reply is, "The Lord only knows; I can neither read nor write." What I found on actual investigation was that, no matter what the man paid, he was going deeper into debt and the moneylenders were receiving a certain sum and writing another and giving no receipt for what they received. There is a gentleman now in Allahabad, Mr. Hamilton, who worked out some most interesting figures; but the Maharaja of Gwalior did not allow them to be published. Mr. Hamilton had several graduates in economics from Allahabad who undertook economic surveys, especially with reference to the indebtedness of the villages, and the results were appalling. No country could possibly carry that burden.

38,774. In any case, the question why the moneylender is so rapacious and whether he can be improved, requires investigation instead of simply guessing at the facts?—Yes. The co-operative credit societies came into existence, I take it, to remedy this. Sir Frederick Nicholson and others who were interested brought them in because of the necessity of doing something. The very fact that they brought in the co-operative societies shows the necessity for some moneylending agency.

38,775. *Professor Gangulee*: Do you find that movement making an impression on the public?—Yes, I do, but unfortunately there has been some bungling and quite a little dishonesty in some places.

38,776. *Mr. Kamat*: On page 553, in the course of your general observations you say that at least 30 per cent. of the population in agriculture must be diverted to industry in India. The whole problem, therefore, of relieving the poverty of agriculturists and improving their lot is, you think, that of having more manufacturing industries into which this 30 per cent. should be diverted; is my inference correct?—I say they should be diverted to industry, commerce and transport. The point of that is that this excess of population on the land keeps wages down; human life and labour is the cheapest thing in India, and that works against the introduction of modern machinery; it does not pay to get labour-saving machinery, because you do not save anything; labour is so much cheaper.

38,777. So that, from your point of view, the question is not one of bringing more men into agriculture, but taking men from the land and diverting them into some other channels?—That is one thing; it is not the only thing. Where would you get your markets? There are so many people to-day telling us that we have got to grow more crops. A big crop is as big a curse to-day as a small crop. See what has happened in the United States with its large cotton crop, in spite of all their marvellous organisation.

38,778. *Mr. Pim*: Your experience with regard to occupancy holdings on your farm illustrates some of the difficulties that an improving farmer may meet. Of course, your difficulty arose from the security of tenure given to the occupancy tenant?—Yes.

38,779. But do you think it is essential to give that security of tenure?—The ordinary farmer must have it, yes.

38,780. You are now the zamindar; have you considered applying under the new Act?—I have already made application under the new Act; under the old Act we could not. I am glad you have brought that point out.

38,781. Do you think the new Act will meet your difficulty?—I think the new Act does meet the difficulty; but, looking at it from the general

standpoint, the new Act, in increasing the security of the ordinary tenant, is a very great gain. We are an exception in that we are an educational institution; educational institutions in these Provinces will not take up any large area of land; but it does work against the tenants that we dispossess, and I have tried to make provision for that by telling them we will give them this sewage irrigated land on a lease for a certain number of years, where I am confident they will make more on one acre than they would on 20 acres unirrigated.

38,782. You mention the sullage farm run by the Municipal Board near you. As a matter of fact, have they had any competent people in charge of that farm?—No.

38,783. Is that the explanation of its fate?—Nobody manages it properly; I have talked with the cultivators, and, in fact, one of them said openly at the auction: "If we did not have to give to the bridge peons, the *chungawallahs*, the police and the man here on the job, if we had not to give them a little of what we grow, we could afford to pay Rs.200 per acre. You are protected, Sahib; these people do not demand of you what they demand of us."

38,784. With regard to the difficulty in acquiring the village, was that question ever considered on its merits in the Municipal Board, or did the discussion go into side issues?—At first we were prevented from getting it because it was *amity*, and the village was declared to be "*waqf*"; the *waqf* papers had been drawn up but were never executed; then, after that, the relations between the two communities changed, but we did not get it just the same. In the first instance, we did not get it because the non-co-operators said: "We are not willing to vote for this American institution getting this." Afterwards, when they parted company, because one side knew that it irritated the other side, they said: "Why should we remove the source of irritation?"

38,785. You mentioned experiments made in the time of Sir Selwyn Fremantle when he was Collector, and you rather suggested that it was merely in consequence of a change of Collectors that these experiments had dropped. Has not the position completely altered since that time as regards control of these schools?—There are two factors now. The man who followed Sir Selwyn Fremantle was not interested, and nothing was done; then the District Board took them over. I am glad you called my attention to that fact; I think it ought to be known that, no matter what the Collector wished to do, it would have to be done through the District Board.

38,786. So far as you have heard or seen, are the District Boards taking a real interest in that side of education?—Well, I have just returned from leave. The most encouraging thing I have seen is that, a few days before the *Magh mela*, the District Board woke up and asked us if we would put on a farm demonstration; they said they had decided to do it, and came to us for our help. I thought that was very encouraging.

(The witness withdrew.)

Mr. Sam Higginbottom.

**Mr. EDWARD KEVENTER and Mr. WERNER KEVENTER
of Edw. Keventer, Limited, Aligarh.**

Replies to the Questionnaire.

QUESTION 16.—ANIMAL HUSBANDRY.—India wants cheaper and more reliable milk and *ghi* so that these important foods, particularly milk, may reach the poorer classes also.

To make milk cheaper.—Recommended: Improvement of the milk-yielding potentialities of the cow and the buffalo in India through (1) provincial control and supervision of the breeding of cattle; (2) establishment of pedigree herds of India's best breeds of cows, buffaloes and goats,

(a) at cattle breeding farms worked by the Government.

(b) by encouraging private dairy farms to breed pedigree herds by lending stud bulls and by assisting such private dairy farms to acquire suitable land for grazing and for production of green fodder crops, the Government in return reserving first claim on the male calves.

(c) by encouraging zamindars to keep cows and buffaloes of types approved of by the Government Cattle Breeding Department and by lending Government stud bulls to them, the Government in return reserving first claim on the male calves.

To make the supply of milk and ghi more reliable.—Recommended: Food laws to protect not only the public, but also the honest dairy man.

The rural population who can afford the cost of milk and *ghi* has no difficulty in obtaining the pure article, but for the town population protection is required in the way of food laws based on scientific knowledge. Some Municipalities in India, while paying no attention to the adulteration of milk by addition of water, enforce by-laws which go to destroy all skimmed milk, and thereby deprive the poorer classes of a cheap and most valuable food, and besides deprive the producer of its legitimate price.

A standard of milk ought to be adopted and enforced.

Ghi is being adulterated, as a rule, by the middleman by the addition of animal fats, extracts of vegetable oils and *senji*. Enforcements of suitable food laws only can stop this.

(a) (ii) *The betterment of the dairying industry.*—Recommended:

(1) Food laws as suggested above.

(2) Teaching modern methods of handling milk, manufacturing of butter, casein, milk sugar and cheese at the agricultural colleges, bearing in mind always that for the teaching of methods to students there is no justification for a large production, such as aimed at by the butter factory of the Imperial Agricultural Department at Anand which will, if allowed to extend its trade activities in the butter market in India, more or less destroy the prospects for private dairy enterprises, since the demand for butter within India is a very limited one, the large majority of people being accustomed to the use of *ghi*, for the manufacture of which no modern and costly dairy factory is required. A butter factory owned by the Government is backed by unlimited capital and credit, without any personal pecuniary risk of loss to the individual organizer, and carries with it an unearned reputation and guarantee which no private enterprise possesses except through long, honest and efficient service to the public. A comparison will disclose to every fair-minded person the great injustice trade competition from Government concerns does to private enterprises. Proof of the paying possibilities for dairy farming in India is already in evidence in the country.

(3) Milch cows and milch buffaloes to be carried by fast trains on the railways at concession rates, not exceeding the rates charged when booked

by goods train. The suffering caused, particularly during the hot weather, to milch cows, milch buffaloes and their small calves in being confined to an iron covered railway truck for five days and five nights in succession, as is the length of time for such a journey by goods train from Delhi to Howrah, during which time the animals cannot lie down more than two at a time, nor be properly milked or fed, results often in permanent injury, and through the rough shunting at junction stations, which goods trains are subject to, sometimes total loss of animals. Eight cows or buffaloes with their sucking calves (the number of animals carried in one truck on broad gauge lines), are carried from Delhi to Howrah (903 miles) at a freight charge of Rs.282 when booked by goods train, while, if booked by passenger or parcel express train, the freight charge is Rs.620-13, which is prohibitive.

It seems hard to a purchaser of the best milch cows and buffaloes obtainable not to be able to bring them to their destination in the same condition as they were when purchased, but almost as a rule deteriorated to half the value paid for them. The scarcity of good milch cows and buffaloes is growing worse from year to year. One of the reasons for this is that the best milch animals in the cattle producing Provinces are brought to Calcutta and to Bombay, where at the end of lactation they are sold for slaughter, because the milk-vendors in these towns cannot afford to stall-feed dry cows until they calve again, nor can they afford to send them back to their former home because of the high railway freight. A reduction in the railway freight charges would to a great extent eliminate this deplorable waste of valuable cows and buffaloes.

- (4) The removal of import custom duty on
- (a) Seamless milk and cream cans.
 - (b) Glass milk bottles with closing devices, such as discs, caps and seals.
 - (c) Milking machines and their component parts.
 - (d) Milk testing appliances and instruments.

(5) Reduction in railway freight charges on butter, ghee and cheese when booked by passenger or parcel express trains. Owing to the great heat in India, butter carried by rail has to be packed in insulated boxes with ice from early March to the end of November. As an instance, a box containing 50 one-lb. tins of butter with insulation and ice packing weighs gross $1\frac{1}{4}$ maunds, and the railway freight on this parcel from Aligarh to Bombay is Rs.8-12, or annas 2.8 per lb. of butter, and from Aligarh to Howrah Rs. 8-4, or annas 2.64 per lb. of butter, which in addition to the cost of the necessary insulation material and ice adds considerably to the manufacturing cost. If refrigerating railway vans existed for carrying of dairy produce, the costly method of ice packing would be eliminated, but the introduction of such vans on all railways for the sake of the dairy industry may not be practicable for a long time to come, and therefore a reduction in the railway freight charges would meet the need best. Should export of Indian butter become desirable, refrigerating vans on certain railways as well as cold storage houses at the ports of Bombay and Calcutta, also cold rooms on board such ships which undertake to carry the butter should be provided.

(b) (i) *Overstocking of common pastures* cannot be said to exist anywhere in India, because there is no pasture for the cattle worth the name of pasture except during the rains when the common land produces more than ample pasture for the herds in existence. By November the common land of the villages is practically useless as pasture, whether it has been grazed or not during the monsoon months. Production of green fodder crops is essential for rational feeding of improved Indian herds of cattle.

QUESTION 18.—**AGRICULTURAL LABOUR.**—The shortage of agricultural labour at harvest time in the months of October and November is much felt, but

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the shortage is due to malaria epidemics which, as a rule, are prevailing at those times. If travelling dispensaries were established in large numbers which could reach the rural population with free and frequent distribution of quinine and other simple medicines, a great improvement in this respect would result.

Oral Evidence.

38,787. *The Chairman:* Mr. Edward Keventer, you represent the firm of Edw. Keventer, Ltd.?—(*Mr. Edward Keventer:*) Yes. I have with me Mr. Werner Keventer, who is managing the business.

38,788. Will you tell us quite shortly what your business is, and something of its scope?—The Aligarh dairy farm is our head farm, and we have four branch farms, at Darjeeling, Calcutta, Delhi and Simla.

38,789. Are you tinning butter?—To a certain extent.

38,790. Is that the principal part of your business?—No; our principal trade is in fresh butter.

38,791. On the question of improving the milk yield of Indian cattle, I gather your view is that, on the whole, matters are moving in the right direction, but you would like to see them go a little faster? Would you like to have provincial experimental breeding stations? You refer to provincial control and supervision of cattle breeding?—(*Mr. Werner Keventer:*) We think control should be left to the Provincial Governments, but private enterprise should be encouraged to work on the same lines.

38,792. Does that mean you do not think the Government of India, as such, should take part in the work?—No, we think they should.

38,793. Both the Government of India and the Provincial Governments?—Yes.

38,794. Where does the milk you handle come from? From your own cows?—We have our own herds and also buy from *gowalas*.

38,795. Are you familiar with the Military dairies?—Yes.

38,796. Do you know their farm at Lucknow?—Yes.

38,797. Have you seen there the results of crossing Friesian blood with indigenous animals?—I know the result of crossing with Ayrshires.

38,798. The feature of the farm at Lucknow is the cross I mention, and I think there are strong indications that it is a very good blend?—We believe so, too.

38,799. In the matter of teaching dairy farming, you do not think manufacture on a large scale is necessary for purposes of instruction, and, in your opinion, what the Imperial Agricultural Department is doing at Anand amounts to unwarrantable competition with private enterprise?—Yes.

38,800. Without expressing a view on that point, I should like to ask whether you think on the technical side a good deal of experimental work still remains to be done? I am thinking of the possibility of making milk powder, condensed milk and things of that sort in India. Is that a line on which you would like to see Government carry out purely experimental work?—Condensed milk can no doubt be made in this country, but we doubt whether it would be a financial success.

38,801. What about the preparation of casein?—That can be made successfully, and is being made in India now to a considerable extent.

38,802. You will probably agree that in the present state of the demand for dairy produce of good quality it is very necessary, if the industry is to prosper, to develop all these side-lines as much as possible?—Yes.

38,803. Is there any reason why a large part of the tinned butter at present imported into India should not be made and tinned in India?—As far as we know, only a small amount of tinned butter is imported into India.

38,804. But a great deal of condensed milk comes in?—Yes.

38,805. You put forward certain views about the facilities offered by railway companies and the freight rates charged for cattle. If you are sending a pedigree animal, I suppose it is possible to send it in a horse-box?—Yes.

38,806. But that means extra expense?—Yes.

38,807. Having regard to climatic conditions and to the great distances Indian railways have to contend with, do you think the existing service is really as bad as you paint it here?—Yes, that is our experience.

38,808. You say: "The suffering caused, particularly during the hot weather, to milch cows, milch buffaloes and their small calves in being confined to an iron-covered railway truck for five days and five nights in succession . . ." is considerable. There are two points there. First of all, is it your suggestion that the railway trucks should be improved?—Yes, given a different roof and flooring.

38,809. You cannot do very much about the five days and five nights, can you? That follows the geographical situation?—In former years we were allowed to have our cattle trucks attached to passenger trains and also to the parcels express, which go faster.

38,810. There has been a worsening of the position of late?—It is still allowed if we pay special rates, but these are prohibitive.

38,811. Originally, you enjoyed this advantage for the same rate as was charged for goods trains?—Yes, as a special favour the railway allowed us that privilege.

38,812. Have you any views as to the possibility of improving the fodder supply during the season of shortage? How do you manage that in the case of your own herds? Do you grow fodder crops?—We grow our own fodder crops.

38,813. What do you grow?—During the winter, oats; during the summer, chiefly *juar*.

38,814. Do you grow any clover or berseem at all?—We have grown berseem, but not successfully. This year we are trying clover in two places, Aligarh and Delhi, but only as an experiment. We are very successful with oats and we also grow mangel-wurzels.

38,815. Do they do well?—Yes.

38,816. Do you find they keep in India?—No. We feed them as soon as they are ready; we cannot store them.

38,817. Do you attempt to preserve any fodder by means of silo pits?—No, because we have not that quantity of fodder. What fodder we have we can feed while it is green.

38,818. It would not pay you to make it into silage?—It would if the stuff were available.

38,819. Do you make *ghi*?—Yes.

38,820. Do you use a modernised process for that or the indigenous system?—We do what everybody who makes *ghi* in India does: melt down the butter, remove the moisture by boiling, and tin it.

38,821. I wondered whether you had devised any large-scale process?—No, because the market price for *ghi* is such that we cannot make it at a profit. We make *ghi* at a loss when we have a surplus of butter; that is all.

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38,822. What fuel do you use?—Coal, or kerosene oil in Primus stoves.

38,823. We have been told that cowdung is an ideal fuel for the manufacture of *ghi*, as it gives a smokeless fire without any flame?—I do not think it matters what you use.

38,824. You can make just as good *ghi* with any fuel?—I am sure of it.

38,825. Are you carrying out any breeding experiments?—Yes.

38,826. Are you trying crossing with European breeds?—Yes, we have tried crossing with Ayrshires and been quite successful. We have just brought out an Ayrshire bull from Scotland, which is on its way up to Simla. We have also brought out black Welsh cattle, and are experimenting with this breed in Darjeeling.

38,827. Would you like to see the public in the large towns in India protected against adulterated or impure milk and milk products, either by new municipal laws or rules or a stricter enforcement of existing ones?—We welcome control, but it should be of a kind that does not destroy any of the products.

38,828. Meantime, as regards an important part of the market, the honest dealer can hardly hope to compete with the dishonest?—That is true.

38,829. What do you mean when you say “that does not destroy any of the products”?—We speak from experience of two Municipalities in India where bye-laws have been introduced to the effect that skim-milk must be coloured in order to prevent admixture with whole milk. This is carried out although there is nothing to prevent the watering of milk.

38,830. So that you destroy the skim-milk trade without protecting the public against adulterated milk; is that the point?—Yes.

38,831. What colouring is used?—In one place the colouring matter from *Jesu flower* was first used, giving a yellow-pink colour. This did not serve the purpose, and it was then suggested catechu should be added. That is very astringent. That is still in force in one Municipality.

38,832. Which?—Muttra.

38,833. That is also yellow?—Yes.

38,834. Does not that make the skim-milk look like Jersey full milk?—It looks discoloured, and it spoils the flavour altogether; no human being could drink the milk.

38,835. Is that the intention of the rule?—I cannot say.

38,836. Has your firm, or any other interest, got large creameries there where butter is manufactured and the skim-milk sold?—At the time this was introduced we had a creamery there, the cream of which was sent to Aligarh for butter making.

38,837. I suppose this rule would make it impossible for you to sell the by-product, skim, from the manufacture of butter, while still leaving the local dairymen free to sell adulterated milk?—Yes.

38,838. Whence did the stimulus come for the passing of this rule?—Possibly from a certain class of the public.

38,839. *Sir Thomas Middleton*: When did you first come to India, Mr. Edward Keventer?—(*Mr. Edward Keventer*): At the end of 1889.

38,840. Did you join the Bombay Agricultural Department?—I was first sent out by the Dairy Supply Company, of London, to introduce modern dairy appliances. After that I went to the United Provinces for a short time to carry out some cheese-making experiments, and in April, 1890, I was taken on by the Bombay Agricultural Department.

38,841. You worked at Poona?—Yes.

38,842. With Mr. Ozanne, Director of Agriculture?—Yes.

38,843. How long were you there?—A year.

38,844. When did you sever your connection with Government?—Up till November, 1894, I was running the Aligarh farm for Government. I was then offered the farm on lease by Mr. (later Sir John) Miller, who was then Director of Agriculture.

38,845. How many cows have you of your own at the present time?—About 700 head of cattle all told.

38,846. What yield per lactation do you aim at?—The average yield is very low.

38,847. What do your best cows yield?—I cannot say the lactation, but the maximum yield is 18 seers a day.

38,848. From country cows?—Yes.

38,849. You must buy cows in large numbers, and no doubt you select them very carefully. What percentage of those you buy satisfy you when you get them on your farms?—A number of them prove failures owing to the bad treatment they receive in transit, being carried in unsuitable trucks in the hot weather. About 50 per cent. satisfy me.

38,850. How much grain or concentrated food do you allow your best milkers between the months of January and June, in the dry season?—About 16 lbs.

38,851. Do you feed much hay to the cows on your farms?—Yes, at Aligarh and Delhi we give them what hay we have.

38,852. Which do you rely on most, hay, or *kadbi* from *juar* and *bajri*?—We use *kadbi* to a certain extent.

38,853. Which do you prefer, hay or *kadbi*, weight for weight?—We have not access to good hay, and prefer the *kadbi* to the hay we are able to buy. We feed the *juar* green, so that it is not dry *kadbi*; but even the dry I prefer, to the hay I am getting.

38,854. You say there is no over-stocking of common pastures in India because there is ample pasture during the rains, and nothing after November. I think you must be referring to a very small part of India when you say that. Even in the rains one often sees that common pastures are bare and that animals come off them in very poor condition. Has that not been your experience?—(Mr. Werner Keventer): Not in our part of India.

38,855. Not in the United Provinces?—Our experience is that there is ample grazing during the rains when there is a good monsoon, but no sooner is the monsoon over than it ends.

38,856. That experience must be quite local; there are many districts to which it does not apply?—We are speaking of Delhi and Aligarh.

38,857. Sir James MacKenna: How many cattle have you under your control?—(Mr. Edward Keventer): About 700.

38,858. How many indigenous cattle?—They are all Indian cattle, except for a few crossbreds at Darjeeling.

38,859. Is mortality high amongst your cattle? Do you lose many from rinderpest?—Owing to the system of inoculation we do not now.

38,860. Do you use the simultaneous method?—No, the serum alone. As soon as we see a case we get them all inoculated.

38,861. That has proved effective?—Yes, it has been a great blessing.

38,862. What is the principal breed you are dealing with?—Sahiwal from the Montgomery district and the Hissar breed.

38,863. Do you do any grading-up by selection with these breeds?—We keep the best and dispose of the inferior ones. We never dispose of a young pedigree cow.

Messrs. E. and W. Keventer.

38,864. Do you think the herd is being graded up? Has there been any improvement in the milk-yield?—To a certain extent. We have not good pasture all the year round; we would have had more of our young cattle left if we had a better farm.

38,865. What do you charge for milk delivered in bottles in Delhi?—(Mr. Werner Keventer): I think it is 9 annas a quart (40 ounces), but we have so many places it is difficult to remember what the local rate is. As a special rate, we supply hospitals at 4 seers to the rupee, but in cans, not bottles.

38,866. You still have a shop in Rangoon?—Yes, but not for milk.

38,867. Professor Gangulee: Is it pasteurised milk that you sell in Delhi?—Yes.

38,868. Sir James MacKenna: How does that compare with the price of milk in London?—I cannot say.

38,869. Do you consider the Delhi price a fair one?—Yes.

38,870. Do you have to meet any competition in any of your products in India?—Yes, in Simla from the Government Military dairy.

38,871. They compete in the open market?—Yes. In July 1925 the Military Dairy Department, without any warning to us, organised a kind of trade campaign with the object of capturing all our trade in Simla. The Punjab Trades Association took the matter up with the Director of Farms, with the result that in October of the same year the Military farm restricted their trade activities in Simla to Government servants, inclusive of the United Services Club, which had been our best customer since the time we started in Simla. This restriction, however, has not been of much benefit to us, since at least 75 per cent. of our customers in Simla have always been Government servants, and our dairy farm there was originally started to meet a general want for a reliable supply of milk for Government servants and their families. At that time there was no Military dairy farm at Simla.

38,872. Did they undersell you?—Yes, they offered milk at 3 annas a pound.

38,873. You sell by the quart?—Yes, at, I think, about 10 annas a quart (40 ounces).

38,874. Do you do any training of Indians in dairy work, Mr. Edward Keventer?—(Mr. Edward Keventer): No, only for our own staff. I did when I was working for Government, both in Bombay and Aligarh.

38,875. You think the great obstacle to the development of a commercial dairying industry in India is the inferiority of the cattle; that is the reason more people do not take it up. Have you any suggestions to make for the improvement of the cattle of the country in general?—I think crossing with Ayrshires has proved a success, although I know it is doubted by the Military farms, which have more experience of it than I have.

38,876. There is also the question of susceptibility to disease?—Yes. There are several drawbacks.

38,877. Would you put the development of cattle-breeding before the development of the dairy industry, that is from the point of view of the recommendations that one might make about the expansion of agriculture?—There is now a great competition in this matter by private parties.

38,878. But I suppose that will not advance very far until and unless the cattle are improved?—Yes; the cattle are deteriorating. So far as I remember when I started the business about thirty years ago it was very much easier then to obtain good cattle than it is now.

38,879. Were they better milkers?—Yes. It was easier to obtain good milch cows then; they are becoming more and more scarce now.

38,880. For the development of the dairy industry the first thing is to improve the cattle obviously?—Yes.

38,881. *Professor Gangulee*: What indigenous breeds have you?—Sahiwals and Hissars.

38,882. Pure bred?—We get Sahiwals and Hissars, and we also try to get others which have those characteristics.

38,883. Do you have a system of milk recording?—Yes: at our farms we record the amount of milk in the morning and in the evening.

38,884. You test for butter fat and so on?—Yes; for our own milk we test occasionally.

38,885. Do you buy milk from outside too?—Yes, for butter-making.

38,886. From the neighbouring villages?—Yes.

38,887. On what conditions?—We pay them according to the percentage of butter fat.

38,888. And these people are all *gowalas*?—They are cultivators mainly; we do not buy from the professional *gowalas*, but only from the cultivators or ryots in the villages.

38,889. Do you also deal in buffaloes' milk?—Yes.

38,890. Do you find the people prejudiced against the use of buffalo milk?—We do not buy buffalo milk with a view to selling it, but for creaming the milk and using the cream for butter-making.

38,891. You also make cheese, do you not?—Yes.

38,892. Have you worked out the cost of production per gallon of milk?—Yes.

38,893. Could you give us an indication of what the cost is?—It barely pays us. The milk that we sell barely pays us at the prices that I have just mentioned, namely, 8 as., 10 as., and 12 as.

38,894. I do not want you to include the cost of distribution? I wanted to know just the cost of production on the farm itself, the feeding cost, the overhead charges, and so on?—We have mixed up all the expenses.

38,895. Do you have sufficient pasture land for your herds?—No.

38,896. And therefore you depend chiefly on stall-feeding?—Yes.

38,897. And you have enough fodder supply throughout the year?—We purchase a lot of fodder. We used to purchase *bhusa*, but now we cut grass; in Calcutta however we purchase straw fodder.

38,898. Do you find that there is an increasing demand for pure dairy products in this country?—Yes.

38,899. Amongst the Indians?—Yes, there is an increasing demand.

38,900. For pure *ghi*, pure butter, pure cheese?—Yes.

38,901. What percentage of your customers in Calcutta are Indians?—A very small percentage so far.

38,902. You suggest that a standard of milk ought to be adopted here and enforced. How would you enforce the standard? Would you do it through legislation?—It is enforced in Calcutta and I want it to be enforced in the same way here.

38,903. Is it enforced in the municipal areas of Calcutta?—Yes, also in Bombay and Darjeeling I think.

38,904. Are your calves weaned?—No, we feed them in the Indian way.

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38,905. What do you mean when you say that you feed them in the Indian way?—They are allowed to suck their mothers partly.

38,906. Do you employ trained men in your industry?—We train the men ourselves when they first come to us.

38,907. Have you any dairy classes?—No, we have them working with us in the dairy and in that way they pick up the business.

38,908. Do you find that there is an increasing demand for dairy implements in this country? You said just now that many educated Indians are taking to the dairy business?—There is a good demand for cream separators, Alfa Laval, of which we are the agents.

38,909. You suggest here that the removal of the customs duty would help the industry?—Yes.

38,910. Do you use milking machines yourselves?—Yes.

38,911. *Mr. Calvert*: You said, I think, that the standard of animals was steadily improving in your own herd?—We have nothing to boast of in that respect, because, as I said we have experienced a great deal of difficulty with regard to grazing land and I have not been able to do as much as I might have done had conditions been more favourable.

38,912. You do not breed your own animals, do you?—Yes, we do.

38,913. But you still have to buy, have you not?—Yes, we also buy.

38,914. Do you also keep a piggery?—Yes, at Aligarh.

38,915. That is for using the butter-milk?—Yes, for using the residue from the dairy.

38,916. A complaint was made yesterday that your pure milk was too dear for the ordinary townsman. Do you find that the ordinary townsman is not prepared to pay a fair price for pure milk?—They are rather inclined to purchase inferior milk at cheaper rates. They do not pay sufficient consideration to the quality of milk.

38,917. You mentioned that there is a scarcity of good milch cows and that you have to pay more for them. Do you think that is due to the fact that there are fewer good milch cows in the country, or that fewer good milch cows come into the market for sale?—I think myself that the market has been tapped too much. The best cows obtainable are bought by milk vendors in Bombay and Calcutta who do not look after the cows properly, with the result that, when they get dry, they find it very costly to stall-feed the cows, and so they sell them to the butcher.

38,918. Do you think that the total number of good milch cattle is declining?—I think so.

38,919. You do not think that this shortage is due to the fact that the people now are getting more prosperous and are not so willing to sell their best cows?—The irrigation scheme up in the Punjab has turned such a lot of land into culturable fields that they have actually reduced the number of cattle.

38,920. Has not the land in Montgomery been given out on the condition that the grantee maintains a number of Sahiwal cows?—I have no knowledge of that.

38,921. *Sir Thomas Middleton*: With reference to the slaughter of good cows in the large cities, can you give us any idea to what extent this practice goes on? Of the cows that go into Bombay would you say 75 per cent. are slaughtered?—I am sorry I cannot say; but I think that practice is followed to a great extent. I feel that the number slaughtered would be 75 per cent.

38,922. *Sir Henry Lawrence*: Have you tried any Jersey bulls?—No.

38,923. Have you seen any results of experiments with Jersey bulls?
—No.

38,924. Do you think the Government of India in their Military farms have tried a sufficient number of experiments with different varieties of breeds?—They have tried, I think. Some Jersey bulls were imported, I believe, to Ambala. They were imported for crossing, but they all died, I believe.

38,925. When was that?—About five years ago.

38,926. That is the only experiment you know with that breed?—Yes.

38,927. *The Chairman*: Do you deal much in buffalo milk?—Yes, principally for buttermaking and cheesemaking.

38,928. Is the figure of 700 to 800 animals that you have given us composed partly of cows and partly of buffaloes?—They contain quite a small proportion of buffaloes.

38,929. That is a small part of your business, I take it?—Yes.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Tuesday, the 15th February, 1927, at Agra.

Tuesday, February 15th, 1927.

AGRA.

PRESENT:

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

Sir HENRY STAVBLEY LAWRENCE, K.C.S.I., I.C.S.	Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.	Mr. H. CALVERT, C.I.E., I.C.S.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.	Professor N. GANGULER.
	Mr. B. S. KAMAT.
Mr. J. A. MADAN, I.C.S.	} (<i>Joint Secretaries</i>).
Mr. F. W. H. SMITH	

RAJA KUSHAL PAL SINGH, M.L.C., United Provinces.

Replies to the Questionnaires.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i).—No.

(ii) There is urgent need for extension of facilities for teaching agriculture in many districts.

There is only one agricultural school in these Provinces, viz., at Bulandshahar. The Government has not yet established any other school after the agricultural school at Bulandshahar was opened; but the Government intends to open a second agricultural school in the eastern part of the Province. The reason why Government has not opened any other school is that Government was anxious to ascertain by experience the demand for such school before opening new ones.

The arrangements so far made by Government for meeting the demand for agricultural education do not touch even the fringe of the demand. Only ten teachers were deputed from ten vernacular middle schools to undergo a course of training at the agricultural school at Bulandshahr. The inadequacy of the arrangements by Government will appear from the fact that the Agra District Board alone wants to train five teachers in agriculture for opening five agricultural classes. The Principal of the Bulandshahr Agricultural School informs the Board that he cannot manage to teach more than one teacher a year. In the year 1924, the number of vernacular middle schools in the United Provinces was 573. The demand for more vernacular middle schools continues. Presumably the number has considerably increased.

"The Punjab has recently struck out a line of its own, which seems to possess great possibilities. Ordinary vernacular middle schools are now being utilised for imparting practical training in agriculture to school boys in rural areas. There are two special features of the scheme which have so far contributed much to its success. In the first place, there is attached to each school a farm whose area and equipment is sufficient for practical training on a reasonably large scale. This farm can be made practically self-supporting. In the next place, the training is given, not by one of the ordinary school teachers, but by a teacher specially selected for the work, and trained for a year in the Agricultural College at Lyallpur.

The new scheme has achieved an immediate popularity, and has already spread to a quarter of the total number of vernacular middle schools in the Province." (*India in 1923-24*, p. 241.)

" It is on her agricultural colleges and agricultural middle schools that India must rely if she is to produce the type of highly educated farmer whose influence is so important in raising the level of tillage methods throughout any country." (*India in 1924-25*, page 186.)

So far as agricultural education in primary schools is concerned, absolutely nothing has been done or attempted by the Government.

Paragraph 4 of the Resolution on Dr. Kitchlew's report runs as follows:—

"The Government desire to see the actual teaching in the village school adapted to the needs of the village life, and not based on the requirements of the city child. Two special points are worth attention. The adjustment of holidays to agricultural requirements, and the development of cultivated plots attached to the school. There should not be any difficulty about holidays, now that Government have modified the method of examination at the end of the primary stage. The hours of school session may be a more difficult matter, but this question should be examined by the Director of Public Instruction. As regards the second point, the Government realise that school cultivation which is a failure may be worse than none at all, and that the town trained teacher is not likely to have much natural enthusiasm for it. But they think that at this point the Education Department should join their efforts with those of the Agricultural Department. There seems no reason why school agriculture should not be successfully developed at a select number of prospering schools, and why the Department of Agriculture should not help with its seeds and methods, so as to make the school a lesson to parents. This question should be examined by the Director in consultation with the Agricultural Department and definite proposals should be submitted to Government."

The development of cultivated plots attached to schools is a big question and requires a very large sum of money. The examination of the scheme and the formation of concrete proposals will take a long time. In the meantime I desire that I may be permitted to work my scheme. My scheme is as follows:—

Selected teachers from vernacular schools should be sent to the Bichpuri farm for training in improved and up-to-date agricultural methods. These teachers after they have received the necessary training should be made to give practical instructions to their pupils.

In the current year I want to give practical education in agriculture to 25 teachers. From July next I want to increase this number to 70. These teachers will work on the Bichpuri farm at stated times, off and on for about three months a year and acquire practical knowledge of agricultural practices as well as of improved varieties of crops and improved implements. Instruction will at every point be closely allied with the doing of the thing. A course for them will be drawn up by the Superintendent of Agriculture on the Bichpuri farm. On completion of these short courses these teachers will be posted to villages where improved varieties of crops have been introduced or where improved implements are in use. These teachers, who have acquired practical knowledge of manures or combinations of manures, will show to their pupils the best manures that are used by skilful cultivators. A liking for agriculture will be created and more knowledge will mean larger outturn. In several villages some cultivators have taken to the growing of those varieties which pay best and teachers and schools will be the best medium of diffusion of knowledge of the best varieties and improved implements. Improved seed is available in the district for distribution. Teachers can show the advantages of using improved seeds and spread their use.

The present staff at the Bichpuri farm is sufficient only for its own purposes. I want that for one year three extra Inspectors of Agriculture

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should be attached to the farm so that they may give practical training to 70 teachers. Their services will be required for three months in a year. When these teachers have finished their courses they will teach practical agriculture by taking their pupils to fields run on approved lines and impress on them the advantages of introducing improved varieties of crops or improved implements. These teachers will visit the Bichpuri farm each year to keep their practical knowledge up to date. The demand for agricultural education has been insistent. In August last I wanted to select 40 teachers for training in agriculture. Nearly 800 teachers offered themselves as candidates. On completion of short courses these teachers will be given a monthly allowance of Rs.2 each.

Fortunately for the Agra district the inspecting staff are most enthusiastic workers, and they are determined to make the scheme a success.

(iii) Yes.

(iv) The question of stimulating the demand does not arise in these Provinces as the demand is far in excess of the supply.

(v) Service.

(vi) Not necessarily.

(vii) Greater stress should be laid on practical work than on theoretical teaching. The period of training for normal trained teachers should be increased from nine to twelve months.

(viii) A large majority of our teachers pass the Vernacular Teachers' Certificate Examination. They are taught nature study and object lessons. They do not understand these subjects properly. The result is that in the district of Agra, these subjects are not taught in any single school. School plots have not proved successful in the Central Provinces. I do not think they will prove successful in our Provinces. It is very difficult to protect these plots from cattle which browse plants grown on them. They are too small to allow improved agricultural practices to be demonstrated therein. School farms are of great utility, but they can be attached only to middle schools and schools in suitable localities on account of the initial outlay involved and the cost of maintenance.

(ix) Mostly Government service.

(xi) No.

(xii) By means of successful demonstration.

(xiii) The scheme has been outlined above. The Government should make a grant to the Agra District Board which would work out the scheme.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) The measures which have been successful in influencing and improving the practice of cultivators are (i) the cultivation of small plots on their own lands by cultivators with own hands under the supervision of the Agricultural Department, (ii) seed and demonstration farms, (iii) implements depôts, and (iv) the starting of exhibitions and competitions at different places to show what results improved methods and improved implements can bring about.

(b) Cultivation of small lots on cultivators' own land by the cultivators themselves.

(c) Frequent demonstrations of improved methods, distribution of small pamphlets in simple language pointing out what advantages are likely to accrue from the adoption of expert advice.

(d) The Bichpuri farm bears eloquent testimony to the success of improved methods. The profits made by this farm in 1925-26 were Rs.2,681 and in the current year Rs.3,000. It has largely helped to popularise improved agricultural methods and improved implements.

QUESTION 4.—ADMINISTRATION.—(c) (i) The number of Inspectors of Agriculture is too small. There are only three Inspectors in the district of Agra. Their number should forthwith be raised to five as they cannot at present cope with their work.

QUESTION 5.—FINANCE.—(b) The Agra Tenancy Act and the rules made under the Land Revenue Act have given great stimulus to zamindars to cultivate their *sir* lands. The reduction of revenue on *sir* land from 25 to 15 per cent. is an additional incentive. The Government should give them *taccavi* for agricultural improvements on easy terms.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) Indebtedness is often a legacy left by the forefathers of the cultivator. There is practically little surplus left after the expenses of the maintenance of his family are deducted from the gross produce. The other reasons are unthriftiness of the cultivator, extravagance on the occasions of births, marriages and deaths, and seasonal calamities.

(ii) The sources of credit are the village moneylender, co-operative credit where the societies exist, and *taccavi* advances made by zamindars and Government.

(iii) The reasons preventing repayment are the same as stated in (i).

QUESTION 23.—GENERAL EDUCATION.—(a) So far as higher education is concerned, agriculture has not been made a subject by any of the Universities in these Provinces. Should it be made a subject, many students, especially sons and near relations of the large landholders will prefer to take agriculture; the poorer classes of the population too do not seem to favour a rigid vocational education but prefer that their sons should receive training less restricted in its scope. Practical agricultural education under the supervision of Universities should be encouraged by making agriculture a subject for the B.A. and M.A. examinations. There are only three high schools in the United Provinces (Jamna Mission High School, Allahabad; the District Board High School, Kanauj; and Isabella Kohum College, Lucknow) which teach agriculture. Government should open agricultural classes in those of its high schools where there is likely to be an effective demand for agricultural education. The subject of agricultural education in elementary schools has already been dealt with. (*See answer to Question 2.*)

Oral Evidence.

38,930. *The Chairman*: Raja Kushal Pal Singh, you have provided the Commission with a note of the evidence that you wish to put before us; would you like to say anything in amplification of that note or shall we ask you questions?—I have nothing to add.

38,931. I see you are a member of the Legislative Council?—Yes; I am also Chairman of the Agra District Board.

38,932. Are you a landholder?—Yes.

38,933. Do you farm your own land at all?—No; I used to do so some years back, but for the last five or six years I have been living at Agra.

38,934. Do you keep in touch with practical farming?—Yes.

38,935. Have you large estates?—I pay a land revenue of Rs.90,000 a year.

38,936. Is that land irrigated or not?—It is partly irrigated by canals, but on the bulk of the property there are no canals; there is irrigation from wells.

38,937. Tube-wells?—No, not tube-wells, ordinary wells, most *katcha* wells.

38,938. How is water lifted from most of these *katcha* wells?—By the ordinary process, with a leather bucket.

38,939. By hand or by bullock lift?—By bullock lift.

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38,940. By Persian wheel?—No, the Persian wheel is for a low lift of from 4 to 8 feet.

38,941. The Egyptians are rather more enterprising than that?—They have introduced an improved variety of Persian wheel here at Bichpuri; they have made certain improvements in Persian wheels.

38,942. In your note you have given an answer to our Question 2 on agricultural education?—I have divided the subject into two parts: middle vernacular schools and primary schools.

38,943. I think your suggestion is that the Bulandshahr type of school is the one that you wish to see extended?—Yes.

38,944. Have you been to Bulandshahr at all?—I have not.

38,945. Do you know the curriculum there?—Yes; greater stress should be laid on practical work; that kind of practical work can be taught at Bichpuri farm by Inspectors of Agriculture.

38,946. At what age do you suggest the boys should go to these schools which you wish to see set up?—Boys do not go. Teachers alone are sent.

38,947. Do you think that the public would be prepared to pay for this extension in the educational system which you propose?—In what way?

38,948. Taxes. Is there any other way in which it could be paid for? Such schools can be supported by the District Boards; the District Boards can contribute something.

38,949. By further taxation?—Yes.

38,950. Do you think that the public would be prepared to support a proposal for further taxation?—The demands are becoming very great, and the District Boards will have to impose new taxation very soon. As regards the middle vernacular schools, I want teachers to be permitted to attend farms in the district; in some of the districts there are farms, as for instance, in the district of Agra. The Agricultural Inspector could teach them very well here. Greater stress should be laid on practical work; the curriculum of Bulandshahr School might be altered so as to pay more attention to practical work.

38,951. Is it your suggestion that a vocational bias should be communicated to the curriculum of primary schools?—Not exactly vocational; what I mean is that teachers should periodically visit farms; they should remain at those farms off and on for about three months every year, and they should work with their own hands under the supervision of the Inspectors of Agriculture; they should go to those farms at the time of such seasonal operations as sowing and harvesting.

38,952. This is in the primary school?—This is for teachers; when those teachers return to their schools they should take their pupils to the fields and there instruct them as to the use of improved methods and implements.

38,953. Do you not think the primary schools are better occupied in trying to teach literacy to the children?—Yes.

38,954. Do you not think that is the true objective of primary education?—That is, no doubt, so, but that has become the sole objective; in addition to that we must prepare the pupils for their life work, which is the industry of agriculture. The present system of education does not equip the boys for their life work. To prepare them for their life work should be the primary object; the secondary object should be to make them literate.

38,955. You think there is time to teach them both?—Yes, there is; the two things can be done easily, as they are connected with each other.

38,956. Have you considered the cost of putting every teacher in your primary-school system through a course such as you suggest?—It will not

be necessary to give practical training to every teacher, because this practical training in agriculture will only be given by the head teacher in the third and fourth classes. Generally, in a district where there are about 300 or 350 primary schools, the total number of teachers is about 700; so that for the present we shall have to teach about 300 teachers. We can find money for that purpose; we shall have to give them very little in the beginning and during training.

38,957. What do you wish to say for or against the teaching of English in middle schools?—Some very brilliant students join English schools and the teaching of English is very helpful to them, but not to others.

38,958. Would you like to see middle schools without any teaching in English at all?—No, because that would be a serious handicap to brilliant boys.

38,959. *Professor Gangulee*: You refer on page 600 to the Agra Tenancy Act; what provisions in that Act do you think have given stimulus to zamindars?—Under Sections 40 and 41, zamindars can acquire land for improved agriculture from occupancy tenants, and they can acquire land from statutory tenants for their own cultivation for establishing orchards or gardens; there is provision for the forcible acquisition of land for the purposes of agriculture, horticulture and gardening.

38,960. Do you think the zamindars in this Province have taken advantage of that provision?—They will; it is too soon to say to what extent they will profit by those provisions. Generally they are taking advantage of it; the new Act came into force on the 7th September, 1926.

38,961. *Mr. Calvert*: Is sugarcane largely grown on your estate?—In the district of Agra it is largely grown.

38,962. How much do you think your selected teachers could learn about sugarcane in three months?—They can learn a lot.

38,963. Have you ever seen a book by Mr. Noel Deerr on sugarcane?—No, I have not.

38,964. You speak of the demand for agricultural education; do you mean demand at a price? What price are they prepared to pay for agricultural education?—By "demand" I mean that teachers are very anxious to learn agriculture; there are about 700 teachers under the Agra District Board, and about 300 or 400 of them are very anxious to learn practical agriculture.

38,965. But at what price? How much are they prepared to pay for it?—Not exactly pay for it, but they will go to Bichpuri farm, they will spend their own money, they will feed themselves at their own expense.

38,966. The demand is practically for free agricultural education?—Free agricultural education, of course; primary education here in the district of Agra is already free.

38,967. You speak of indebtedness being often a legacy left by the forefathers?—Yes, that is so.

38,968. Would you encourage insolvency among cultivators?—No.

38,969. Would you let this inherited debt go on?—I have not thought over the subject, but I think there would be serious difficulties in the way, because if they once become insolvent they will not be able to get money from anywhere, and they will be worse off in that case.

38,970. Do you not think that insolvents always manage to get money again from somebody else?—But not these cultivators.

38,971. Would you say that the number of moneylenders is increasing?—It is not increasing, because most of our moneylenders who resided in rural areas have gone to the towns and cities and have taken to other professions.

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38,972. In this district do the cattle dealers sell cattle on credit?—Yes, they do.

38,973. And take instalments?—Yes.

38,974. So that they also are a source of credit?—Yes, they are, and they perform very useful work in that way.

38,975. At a price?—Yes.

38,976. Do goldsmiths act as pawnbrokers?—Sometimes; very seldom.

38,977. *Mr. Kamat*: You have said that the first object of primary schools should be to equip the boys for their life work and that literacy should be a secondary object?—Yes, because literacy will increase their efficiency, but they must get work first and then they must be efficient workers; therefore, literacy must occupy the second place.

38,978. But if you do not make them literate you will not raise their level of intelligence, and they will not be able to understand such things as the laws of sanitation, hygiene and improvements in agriculture, which they should read about?—I do not say that literacy should be discarded altogether, but that should be the secondary object; the main object should be the development of agriculture, which they should learn for earning their livelihood, and for that they must be educated so that they shall do their work more efficiently than others.

38,979. Is this the ideal or the objective which your District Board places generally before itself about primary schools?—At any rate that has been the objective since I have become the Chairman of the District Board.

38,980. Speaking about District Boards, you said the difficulty was about taxation?—Yes.

38,981. Supposing you have not sufficient finance, was any attempt made to sound the members as to whether new schemes of taxation should be pushed on in the interests of the people?—It will have to be done, but that point has not been specially urged yet; but it will have to be done very soon, say this year or the next.

38,982. Are you feeling the pinch of finance for various improvements?—Yes.

38,983. For roads and other things?—Yes, for roads, for schools and also for agricultural education. There are now twelve vernacular middle schools, and I want that there should be agricultural classes opened in at least five of them; zamindars are supplying fields for that purpose.

38,984. You have had the Compulsory Primary Education Act introduced in this Province quite recently?—Yes.

38,985. Is any serious effort being made to give effect to it in opening schools?—Not till now, but the schemes are under the consideration of Government.

38,986. I know rules are being framed, but the time is near at hand when you should be thinking of raising funds if you want primary schools?—Yes.

38,987. Is there any attempt made in your District Board to do that?—Yes.

38,988. New taxation will have to be imposed?—Yes, and unless we impose taxation we shall not be in a position to make an effective demand from Government.

38,989. And as Chairman of the District Board you are inducing your friends and colleagues to be prepared for further taxation; is that the attitude?—Yes.

38,990. *Sir Henry Lawrence*: You are anxious to see a degree in agriculture established in the University?—Not exactly a degree in agriculture, but I want that agriculture should be made one of the subjects for the B.A. and M.A. examinations.

38,991. You do not want to have a separate degree in agriculture?—No. The diploma examination of the Cawnpore College is quite sufficient for that purpose.

38,992. The Cawnpore College is turning out men with a high knowledge of agriculture?—Yes, in scientific and practical agriculture.

38,993. You do not want anything more than that?—No. But people from Agra and other distant places cannot go to Cawnpore though they want to learn practical agriculture for their B.A. and M.A. examinations.

38,994. How will that be taught?—Instruction can be given on farms attached to the University or to the College.

38,995. Where will these farms be? I do not quite understand your scheme?—These farms should be attached to the constituent colleges of the University.

38,996. Every college will have a farm?—No; the farm should be established where there is an effective demand for it. If the college is situated in a place where the number of landholders is very large, there will be an effective demand for agricultural education; then there should be a farm attached to the College of Agriculture and agriculture should be taught as one of the subjects for the B.A. and M.A. examinations. For instance, in Agra and Meerut, where there are colleges, the number of well-to-do agriculturists is very large.

38,997. Has a similar scheme been adopted in any other Province till now?—I do not know.

38,998. There is a scheme before the University for the creation of a Faculty of Agriculture, is there not?—I am not aware of any.

38,999. If there were such a scheme and if it required any assistance in the shape of money from the Legislative Council, would it receive that support?—Yes, it would.

39,000. That is a different scheme to the one which you advocate?—Yes.

39,001. Still it will receive support?—Yes.

39,002. Are the big landholders in this part of the country taking interest in improved agriculture?—Yes.

39,003. Have they got tube-wells?—They have not got tube-wells because the water is at a very great depth.

39,004. What sort of depth?—About 60 or 70 feet.

39,005. Does not the tube-well go down so far?—Not in this place.

39,006. It cannot go down to 60 feet and get the water?—No, it cannot.

39,007. Why not?—It has not been tried anywhere this side. One tube-well has been put in the tahsil of Kerwadi, where the water level is not very deep; but it has not proved a success and it has not been tried anywhere else.

39,008. On what is your information based that tube-wells will not go as far down as 60 feet?—In the existing condition of Agra I think they will not work well; but I have no knowledge of that. Only one has been tried, as I mentioned, and it has proved a failure.

39,009. Have you adopted any improved methods advocated by the Agricultural Department on your lands? Have you tried any new crops or improved crops? Do you consult the Agricultural Department and follow

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their advice?—Yes. One variety of cotton and two or three varieties of cane have been adopted generally in the district of Agra and they are replacing the indigenous varieties, for instance, cotton No. 19 (Aligarh) and the Coimbatore canes.

39,010. You find some profit in them?—Yes, especially round about the cities where thick cane is sold for chewing purpose.

39,011. Have you yourself derived pecuniary benefit from those ventures?—I do not own any farm at present.

39,012. You are a landowner, I suppose?—Yes, landowner in the sense that I collect rent from the tenants.

39,013. You do not farm any land yourself?—Not at present.

39,014. So you derive no personal benefit from improved agriculture?—No; I do not own any land myself; I have let it out to the cultivators.

39,015. Is that a more paying proposition?—I have been living on rent, especially for the last six or seven years.

39,016. It is all rented out?—Yes.

39,017. And you derive good profit from that?—We take rent from the tenants.

39,018. *Sir Ganga Ram*: You were farming your own land up till six or seven years ago?—Yes.

39,019. Why did you give it up?—On account of domestic reasons.

39,020. Are you now practising as a lawyer?—No.

39,021. You are an LL.B., are you not?—Yes.

39,022. But you are not practising?—No.

39,023. You are Chairman of the Agra District Board?—Yes.

39,024. What is the income of your District Board?—Rs.4,29,000.

39,025. Out of that, how much do you spend on communications?—About Rs.65,000 a year.

39,026. Out of that amount, again, how much do you spend on metalled roads and how much on unmetalled roads?—On unmetalled roads we spend about Rs.9,000 and the rest we spend on metalled roads.

39,027. Do you get any contribution from the Provincial Government towards communications?—At present we do not get any contribution. We are applying for a Government grant for a certain road.

39,028. Are your communications in good order?—Yes; but they are not sufficient.

39,029. Are all the unmetalled roads properly bridged?—No.

39,030. The first thing to do is to bridge them?—Yes; but it will cost a good deal and we cannot find money for that purpose.

39,031. Have you got to bridge only minor streams or are there major streams?—They are only local seasonal streams, and they are entirely dry during the cold season and the hot weather.

39,032. How is your family governed, by the Hindu law of inheritance or by the law of primogeniture?—By the law of primogeniture.

39,033. Why is it so?—We have been settled in this part of the country for a long period and we are always governed by the law of primogeniture.

39,034. Are the other landholders also in the same position?—No; the Hindu law governs them.

39,035. Under what law is your partition governed?—By the customary law, the *kulachar*.

39,036. Are there any other landholders who are so lucky as that?—There are several.

39,037. Can anyone declare himself to come under that?—Yes; they can apply to the Government that the Agra Estates Act may be applied to them. There are two parts to the Act; under the first part the law of primogeniture applies to them, and under the second their properties become inalienable.

39,038. What is the date of that Act?—About 1920; I am not quite certain about it.

39,039. It is a new law?—Yes.

39,040. *Sir Henry Lawrence*: Does this law apply to all members of your community?—No.

39,041. What is your community?—Rajput.

39,042. Which kind of Rajput?—Jadou Rajput.

39,043. Do all Jadou Rajputs have the law of primogeniture?—Yes.

39,044. It applies to your family?—Yes.

39,045. To how many other families does it extend?—Two or three families.

39,046. Has that been recognised in the Courts of Law?—Yes.

39,047. *The Chairman*: Has it ever been tested?—It has been contested, too.

39,048. *Sir Thomas Middleton*: I think you said you had about 700 teachers under your Agra District Board?—Yes.

39,049. You would like to get 300 of these instructed in agriculture?—Yes, in practical agriculture.

39,050. You would send them to school for three months, to the Bichapur farm?—Yes.

39,051. You use the expression "off and on"?—Yes.

39,052. What is your idea? To send them at what time?—To see the seasonal operations, sowing, harvesting, and so on.

39,053. To see the full process of growing crops?—Yes; they will have to go there about ten times a year.

39,054. Would it not be very difficult for them to get away from their school duties?—We can make arrangements for replacing them for such a short period; the work of the teacher who goes to the school for training can be done by one of the other teachers.

39,055. Is it your intention that these teachers should work with their own hands while they are on the farm?—Yes; they should also know how to use the improved implements, how to open them and how to mend them when they get out of order.

39,056. Do you think that you can teach the schoolmaster to mend the implements in three months? You may be able to teach him how to use the implements, but I hardly think he would be able to learn how to mend them?—I do not mean to say that he should be able to mend the implements. He would be able to open the parts of the implements and see what parts have been broken. The implements will no doubt have to be mended by carpenters and blacksmiths.

39,057. What is your idea as to the amount of instruction that children should get from the teachers? What time do you consider these children would have to spend in learning agriculture from the teachers?—They should learn agriculture in the morning and in the evening, that is to say, before the school opens and after it closes. They should be taken

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to the fields and interest should be created in them through practical, ocular demonstrations.

39,058. Is it your belief that if the teachers went to the farms they would be able to get an insight into, and acquaintance with, the working of the Agricultural Department?—Yes.

39,059. And they would be able to tell the children about what was going on in the Province for improving agriculture?—Yes.

39,060. You mentioned agriculture as being a suitable subject for the B.A. How many subjects has a student got to take in his final year?—Three subjects.

39,061. And agriculture would be only one of those three subjects?—Yes.

39,062. You could not, I take it, expect a student to be examined on as extensive a syllabus as if he had passed through, e.g., the Cawnpore College?—Not exactly so much.

39,063. Are there any parts of agriculture which you think would be suitable for the B.A.?—Practical agriculture with an elementary knowledge of science.

39,064. Would it not be useful if, there again, some course were provided on the work of the Agricultural Departments in India, what they have accomplished, the history of the movement in India, and how India has progressed in the last thirty or forty years? Do you not think that it might be possible to introduce some such subject into the B.A. course?—No; that should be introduced in the M.A. course; for the B.A. course practical agriculture might be quite sufficient.

39,065. If you take practical agriculture as one of the three subjects, then the student will never get it up in time?—I think practical agriculture will be quite enough.

39,066. You mention the fact that cattle dealers sell cattle on credit. What sort of terms do they give? Suppose they were selling a pair of bullocks for Rs.200, what kind of repayments would they exact?—There is no uniform rate; it is done on the easy instalment system.

39,067. Do they pay Rs.10 a month, or how much?—No; the whole payment is made within two or three years by instalments.

39,068. What sort of total payment would they require if the original price of the bullocks was, say, Rs.200? Would the total payment amount to something like Rs.400?—Not so much.

39,069. Would it be Rs.300, then?—The interest is included in the price; the interest would be about 2 per cent. per mensem.

39,070. *Mr. Calvert*: The interest is not disclosed?—It is disclosed, but that is included in the price.

39,071. A lump sum price is made and no interest is disclosed?—Yes.

39,072. *Sir Ganga Ram*: You said a little while ago that the spring level of the well is something like 60 to 70 feet below the ground? How many pairs of bullocks do you use to draw water from that depth?—In some places we have to use two pairs, but generally one pair is used.

39,073. For eight hours?—Even less than that.

39,074. How many acres of land can you command by that system?—I cannot say exactly, because the people take to other methods as well.

39,075. Have the people of this district complained about the deficiency of water, and, if so, have they tried boring? I am not talking about tube-wells, but the ordinary wells?—It has not been extensively tried here.

39,076. Has the Agricultural Department not advised you about that?—No.

39,077. *Mr. Kamat*: In answer to Sir Henry Lawrence, I think you said that you had given out all your lands to the tenants and that you collected rent. Were these lands given out on tenancy for life or were they given out on short terms?—There is no period short of life, because life tenancies have been created in our Province. There are occupancy tenants and proprietary tenants and the holdings descend to the sons and successors.

39,078. So that even if you have a desire to introduce new improved methods of agriculture, you have not the power to resume these lands and therefore you are helpless under this system of tenancy?—Yes, that is so; but we can apply to the Collector for the acquisition of any particular land and if the Collector is satisfied that we really require the land for introducing improved methods of agriculture, then he will acquire the land for us.

39,079. So that the Collector has the power to help you to resume the land if you wish to introduce improved methods?—Yes; but we would then have to pay compensation at the rate of six times the rental value of the field.

39,080. On the whole, therefore, the tenancy system is a hindrance to the introduction of improved methods of agriculture on the part of the talukdars?—We cannot do anything ourselves; the Collector's intervention is always necessary, and before he does so, we would have to make an application to him.

39,081. If an attempt were made to liberalise your tenancy systems in the new Legislative Councils, to make them more democratic, would that sort of proposal be received with favour by either the talukdars or the tenants or by both? Public opinion is not ripe for it; am I right?—It has got to be democratised no doubt.

39,082. Then what would happen?—I do not quite follow your question.

39,083. Supposing we wish to make tenancy less rigid than it is at present?—In what respect?

39,084. So that the land could be resumed on short periods or the tenants can effect improvements with benefit or something like that?—Then the zemindars in one case would welcome such a proposal because it would be to their interest.

39,085. But the tenants in that case would be equally opposed to it, so that it would be a very vexed question?—Yes.

39,086. *The Chairman*: As Chairman of the District Board of Agra would you tell us what the Board has done for agriculture?—We have applied to Government for sanction to put my scheme into practice.

39,087. Anything else?—No.

(The witness withdrew.)

BABU ADIRAM SINGHAL, Singhal Dairy Farm, Agra.

Replies to the Questionnaire.

QUESTION 4.—ADMINISTRATION.—(c) (ii) Railways.—The railway arrangement so far as it affects the dairy industry is hardly satisfactory and is not calculated to give as much impetus and adequate encouragement to the same as is desired for the following reasons:—

(1) Oilcake is a staple food for milch cattle, and constitutes also an excellent manure. It is therefore of paramount importance to retain all the available cake within the country and to facilitate its transport from place to place. For the same purpose unrestricted export of oilseeds out of the country is a dead loss and hence undesirable. A glance at the railway tariff rates on oilcakes and oilseeds will suffice. At present the said rates are so anomalous that it is cheaper to transport those commodities to port towns than to places in the interior which are less distant. The rates should be revised and should almost be reversed so as to produce the desired effect.

(2) Another impediment to the development of the dairy industry is that the railway rates are almost prohibitive on dairy products, such as milk. There is no facility for the cheap and quick transportation of milk from areas where it is abundant to places where the supply does not keep pace with the demand. For instance, I have a milk business at Agra which is quite successful. I formed the opinion that the demand for milk in Agra in the hot and rainy seasons much exceeds the supply, and the Tarai area of the Naini Tal district at that period has plentiful milk which can be well utilised to meet the demand of Agra, but for transport facilities. I approached the R. and K. Railway and the B.B. and O.I. Railway authorities through the Director of Agriculture and requested them to grant some concession in carriage as is done by the E.I. Railway Company. But they refused point blank. Such an unsympathetic attitude is highly detrimental to any sort of progress.

(3) Another equally important point is the crying need for refrigerated wagons. In a tropical country like India, transportation of milk and fruits is impossible without cold storage. And the railway companies will do well to make arrangement for refrigerated wagons for certain articles to prevent deterioration due to the intense heat. It is short-sightedness of the railway companies in grudging the initial outlay on this special class of rolling stock, for in no time they would realise a huge income when the trade develops owing to increased transport facilities.

(4) Another source of complaint is the rough handling and pilferage on railway lines. This is a more enormous obstacle than can be imagined. The mischief goes on and has been going on unchecked and the inattention of the railway companies to the representations made to them on this point is almost criminal.

(5) The railways are also very careless about the carrying of dairy cattle. Cattle are huddled together without any regard to hygienic conditions and the capacity of the wagons. And, worst of all, loose shunting is effected in a most irresponsible way, which causes injury to the animals and the death of some. It is a heartrending sight and should be stamped out as soon as possible, also on economic grounds. These conditions cause a serious deterioration of milch cattle in particular and entail incalculable loss.

(iv) *Meteorological Department.*—The activities of this department do not benefit the cultivators at all, as they ought to. The yearly forecast and the daily reports are productive of much good if timely communication is made to the cultivators. But there is no such arrangement. The best method would be that the local meteorological laboratories should disseminate such information within their localities and make it available to the culti-

vators. It is a far cry from Simla to the plains below and their obscure hamlets, and the results of the department should be broadcasted in poster forms in the vernacular, even in the smallest village.

QUESTION 8.—IRRIGATION.—(b) The distribution of canal water to cultivators is in many respects thoroughly unsatisfactory and requires speedy reform. The following difficulties are noteworthy:—

(1) Canal water is not available at the opportune time, when crops require it.

(2) The cultivator has no fore-knowledge of the amount of water that will be supplied by the canal during the season, and is not in a position to make selection of crops according to the water requirements.

To remedy this the Canal Department should work under instructions from the Agricultural Department with respect to the running of canals, and should set out and publish a seasonal programme which should be approximately correct and an accurate monthly programme which should be strictly adhered to. Unless this be done, the water supply cannot be to the best advantage of the cultivator.

QUESTION 14.—IMPLEMENTS.—(b) The obstacles to the use of improved implements are that:—

1. There is no satisfactory demonstration of their working on the fields of the cultivators.

2. The prices of most of the implements are prohibitive and beyond the slender means of the cultivator.

3. Joint purchase and co-operation is not successful.

The remedy that can be suggested is the adoption of the hiring out system. The Government should demonstrate the use of implements on the cultivator's fields instead of on the Government farms, and then give the free use of these implements to the cultivators for a year at least in order to drive home the utility and value of the implements to their conservative and sceptic minds. After that, a nominal rent on the use of the implements should be assessed and made chargeable at the harvest time.

For this purpose Government should establish depôts in every tahsil and hire out implements. The work will be facilitated if the Government gives some sort of subsidy to the manufacturers, who can start their own depôts, or to the leading farmers and zamindars who can undertake the work of hiring out implements, if it is made worth their labours. In the beginning nobody is going to do the work *gratis*, much less when it is likely to cause some loss. So the manufacturers, farmers or zamindars should be encouraged properly by the Government with subsidies and concessions. As soon as the work becomes a paying concern, Government can withdraw its support. The cane crushing *kolhus* may be cited as the best example of hired implement and work remarkably well. The *kolhu* has indeed pioneered the way and is of immense benefit to the farmers, as well as to manufacturers who are not slow to realise their interest and push forward any prospectively successful implement.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) Improvement of the breeds of the livestock is a matter of sovereign importance, and is not receiving that amount of attention which it deserves, either from the Agricultural Department or from the public. The milch cattle and draught cattle have both deplorably degenerated, and have very prejudicially affected the effective tillage of the soil and the health of the people. The improvement of the breeds mostly depends upon the selection and maintenance of excellent bulls for covering. The present stray bulls in the villages are worthless, and they are further deteriorating the future stock. They are badly treated, and are in law *res nullius*, i.e., the property of nobody and can be caught, beaten or even killed; so the Government should make a selection of choice bulls and maintain them in different localities on an extensive scale. No bull not approved by the Agricultural Department should be allowed to be

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used for covering, and those that are so used should be subjected to very close periodical inspections by the department. In the beginning, the Government will have to procure and supply selected stud bulls, but it no longer should be anxious for their upkeep. It may be suggested that a covering fee is levied. I dare say that from the proceeds of the fee sufficient money will be coming forth to meet the maintenance charges of the bulls. It would be desirable if the Government were to work in co-operation with the District Boards and lodge the bulls in cattle pounds in the charge of cattle yard clerks.

Side by side a good pedigree herd should be raised by the Agricultural Department, and when a good number of animals are available, the former bulls should then be replaced by the latter ones.

(ii) India is a purely agricultural country. It is strange and even disgraceful that a country with its traditions and unbounded reverence for the bovine species should depend upon the foreign supply of dairy products.

At present the dairy industry, as far as milk is concerned, is in the hands of *gowalas* in almost all the big cities. But the conditions under which they are producing milk are most insanitary. The dairy farms started in the cities to supply milk under hygienic conditions have not proved an economic success. The result is that the milk supply in cities is very defective, and consequently condensed milk is imported. If, however, the dairy industry is started on the lines I have done, I am sure it will gain a sound economic footing, and will go a great way in effectively solving the problem of the milk supply of great cities, which is the crying need of the day.

Under my scheme the cattle are not kept in the cities. Selected milch animals are procured and given to the cultivators in the villages adjoining the cities. The milk is purchased from the cultivators, milked by my own men under strict supervision into proper dairy utensils, and collected under hygienic conditions at a place in one central village. Then it is pasteurised and refrigerated if necessary, filled and sealed in cans, and then transported to the city morning and evening for marketing as such.

Under this scheme the advantages are:—

1. It is cheaper to keep animals in villages than in cities.
2. It does not require any additional labour on the part of the cultivator. He can keep one or two milch cattle along with his bullocks. His wife and children can take care of them.
3. The risks of famines, diseases, &c., are divided. One man alone will not have to bear the whole risk.
4. This will be an additional source of income to cultivators besides agriculture.
5. The fertility of the land will be increased as the animals will be reared on cultivated lands.
6. Milk is produced under more natural conditions than those obtaining in cities.

The zamindars and agricultural graduates can very well take up the scheme. It has proved equally profitable to the producer, the dealer and the consumer.

QUESTION 20.—MARKETING.—(a) I would confine my remarks to the marketing of milk alone. Under the present system, it is very difficult for the honest dealers in milk to compete with the dishonest ones. The customers cannot easily distinguish pure and good milk from adulterated milk, and consequently go in for any milk which they can get cheap. Thus the dishonest dealers, taking advantages of the ignorance of the customers, flourish to the detriment of honest ones. Under such conditions, the honest dealer and, consequently, the industry, cannot prosper. To put the industry on a sound footing, it is necessary that some standards should be fixed whereby the customers may be able to know the value of the commodity for which they pay.

Oral Evidence.

39,088. *The Chairman*: Babu Adiram Singhal, you have provided us with a note of your evidence. Would you like to say anything in addition to that at this stage, or shall we ask you some questions?—I wish to say something, first, under the heading of agricultural indebtedness.

39,089. Would you like to put that in in the form of an additional statement?—Yes, I would like to make an additional statement.

39,090. We can take that statement at the end of your oral evidence. Perhaps first of all you would tell the Commission a little about your business. Do you own land?—Yes.

39,091. And you carry on a dairying business on your own land?—No, I am carrying on a milk business and I have got an agricultural farm on my own land.

39,092. Those two things are quite separate, I take it?—Yes.

39,093. Would you describe your dairy business to us? You have nothing to say in addition to what you have set down on page 611 of your note?—If you wish I shall describe it in detail.

39,094. You say on page 611: "Selected milk animals are procured and given to the cultivators in the villages adjoining the cities." When you say "given to the cultivators" do you mean given to them free?—I give buffaloes to them on advances; I purchase the animals from the Punjab and bring them here.

39,095. You bring them here at your own expense and you give them to the cultivators and charge them the cost price and they pay back in instalments?—No, they give me the milk instead.

39,096. Do they sign a contract when they take the animal?—No, I do not have anything of the sort; the transaction is done orally.

39,097. Do you make any bargain with them as to the manner in which they are to feed these animals?—No; but generally I look to the health of these animals.

39,098. Do you control the fodder that the animals get?—Yes, I give them fodder if they have not got it; and I also give them cake, gram, etc.

39,099. And you charge them for it?—Yes.

39,100. And do they pay in cash?—No, only in milk.

39,101. But who shoulders the risk in case the cow dies?—Generally the cultivator has to run the risk, but if he has only newly begun to give me milk and if I find him really poor, then only do I take the risk. Whenever a cultivator's animal dies, I have got to give him another animal.

39,102. And then they have to pay for the new animals as well as for the dead animal?—Only one case like that has occurred during the last four years.

39,103. Do your milkers go round and milk?—Yes, I have got many milkmen, and supervisors to supervise these milkmen.

39,104. How many cows can each milkman milk?—I have not limited the number of the cows; but generally two and a half maunds of milk are drawn every day by each pair of milkmen and supervisor.

39,105. How many cows does that require?—That would depend on circumstances; it varies at different times. When there is a less output of milk the number of animals must necessarily be larger.

39,106. Yes, I gather that; but I wanted to know what the average was? Would it be about 30 cows?—Yes, I think it would.

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39,107. What does the cultivator get out of this bargain?—There are some cultivators who have now got their own animals. They have paid me back the price of the buffaloes that they purchased from me.

39,108. And that is their only chance of making anything out of it?—Yes. Then again when they have paid me back and they require money for other purposes, such as buying seed, then I give them advances without charging them any interest.

39,109. How long have you been carrying on this business?—For the last four years.

39,110. How many cows have you out with cultivators at the moment?—The number of cows is less, but I have a great number of buffaloes; I have about 200 buffaloes.

39,111. How many cows?—Not more than 15 cows.

39,112. In those four years how many cultivators have paid off all the charges and acquired full possession of a buffalo or a cow? Can you give us any idea?—I think a minor portion of them have given back the money.

39,113. Can you give us any idea of how many?—They take money from me, and when they have paid about half of it they take more money for other purposes; the general difficulty with which I am faced is that when a cultivator has paid back all my money, other moneylenders who have lent them money fifteen or twenty years back come in, and I have to provide money for those people.

39,114. I am not sure I understand the scheme; I do not understand where the attraction from the cultivator's point of view comes in; he seems to me to get nothing until he has paid you the value of the animal in terms of milk, and he seems to shoulder all the risks of disease, which are not inconsiderable in this country?—No, that is not the case; to my mind they are gaining a great deal.

39,115. What type of cultivator is taking these animals?—Almost all the people in the village have got animals from me.

39,116. In the country districts round about?—No, three villages are controlled by me.

39,117. Do you own the land?—Yes.

39,118. Can you account at all for the fact that cultivators are willing to take your buffaloes or cows under this scheme?—Yes, they are always prepared to take buffaloes.

39,119. What is the attraction to them?—The attraction is that they can pay back in milk very soon.

39,120. But I thought you said a minority had succeeded in doing so in the last few years?—But they go on taking money from me continuously.

39,121. What do you pay them for the milk?—8 seers for a rupee.

39,122. From the very start?—Yes.

39,123. *Sir Ganga Ram*: And at what rate do you sell the milk?—I sell at 3½ annas a seer.

39,124. *The Chairman*: When you start with a new cultivator, he takes your buffalo, he pays for the food and gives it shelter, and your men milk it; is that right?—Yes.

39,125. You value the milk he brings to you at the rate of 8 seers to the rupee?—Yes.

39,126. He gets no cash until he has paid the value of the buffalo?—Yes, and he has money whenever he requires it for marriages or to pay back other moneylenders.

39,127. What rate of interest do you charge for the money which you lend him?—I do not charge him anything as long as he gives me milk.

39,128. You lend him all the money he wants?—Yes. Of course, I look to the type of cultivator; if he is not in a position to repay, I will not lend him money.

39,129. On page 609 of your note, paraphrasing your words, you say that a glance at the railway tariff rates on oilcakes and oilseeds will show that the varying rates discourage the internal consumption of these commodities and encourage export. Is that your theory?—Yes.

39,130. Could you quote one or two of those rates to the Commission?—Yes; the rate from Agra to Ludhiana is 8 annas per maund on oilcakes, whereas from Agra to Bombay the rate is 9 annas, though the latter distance is much greater.

39,131. *Professor Gangulee*: Are you quoting railway risk rates or owner's risk rate?—I do not know, but these two rates are not different; I think they are both at owner's risk.

39,132. *The Chairman*: They are strictly comparable in your opinion?—Yes, they are.

39,133. They are for the same service?—Yes.

39,134. *Sir Henry Lawrence*: What are the two distances?—I think the distance to Ludhiana cannot be more than 500 miles.

39,135. *The Chairman*: Then, on page 609, I see you say that in a flush season when you had a surplus of whole milk for sale you suggested to the R. and K. Railway and the B.B. and C.I. Railway authorities through the Director of Agriculture that they should make some concession in the matter of rates as is done by the E.I. Railway Company. What concession were you thinking of?—I want reduced rates on milk and milk cans on return journeys.

39,136. That is to say, full and empty?—Yes.

39,137. Do you have to pay for the return of empties in this country?—Yes.

39,138. What concessions did the East Indian Railway Company make?—The East Indian Railway Company charges very low rates on milk in cans and returned milk cans; the charges are about 7 annas per maund for 200 miles, but in Agra the charges come to about Rs.1-7-0 from Lalkua to Agra.

39,139. What size of churn do you use for this transport?—10 gallons, but for this purpose I intend using insulated cans.

39,140. To keep the milk cool?—Yes. There are other points I have written about, pilferage and rough handling.

39,141. Do you lock your churns?—I seal them. I have not yet begun importing from Lalkua. The trouble is that they handle the cans very badly; these insulated cans will not stand more than a fortnight's journey in the way they are being handled.

39,142. What is the insulating material?—I do not know what the insulating material is; they are probably imported from Germany; I purchased them from Messrs. Keventer.

39,143. I suppose the fact is that there is so little milk transported that the railway servants are not accustomed to handling the churns?—I think Mr. Keventer is already importing a lot, but still they do not handle them properly.

39,144. You suggest the railway companies would do well to make arrangements for refrigerator wagons for certain articles to prevent deterioration.

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No doubt you realise that the railway company is bound to consider the financial aspect of any proposal of that sort. Then in paragraph 5 on page 609, you make a complaint about the carelessness of the railway company's servants in the matter of dairy cattle when they are being transported?—Yes, that has been the case with my own cattle; the trouble is that they detain the cattle for a long time at junctions. From Rohtak to Agra is a very short distance, but the first wagon I got from there arrived here after eight days. It is really very difficult for one attendant to look after eight buffaloes and eight calves.

39,145. You speak of loose shunting?—Loose shunting is going on recklessly. On one occasion one of the calves jumped out of the wagon and one of them died on the way; almost all the buffaloes I got from my first wagon were half dry; they did not give me as much milk as they ought to have done.

39,146. *Sir Henry Lawrence*: For how many miles did it take eight days?—I think it is 150 miles.

39,147. *The Chairman*: On any one consignment of buffaloes and calves can you tell the Commission with accuracy how many animals were either killed or damaged?—It was only in the first wagon that I had so many animals damaged.

39,148. What did the wagon contain?—Eight buffaloes and eight buffalo calves, and there was only one attendant.

39,149. Of the eight she buffaloes were any damaged?—No; but the buffaloes were much deteriorated in condition.

39,150. What happened to the eight calves?—One of them jumped out of the compartment and one died.

39,151. Is it possible for them to jump out of the wagons provided for the transport of livestock?—Yes. If the door is shut entirely there is no ventilation in the wagon. The wagons are of just the same type as for the goods trains; there are no special wagons for animals.

39,152. They are closed in roofed wagons, are they?—Yes.

39,153. And the only ventilation is through the door which must be kept half open?—Yes.

39,154. Is that accurate?—Yes.

39,155. Have you ever sent your animals in horse wagons?—No.

39,156. You could send them in horse wagons, but that would be more costly?—Yes; the cost will be prohibitive.

39,157. Are you growing any fodder?—Yes.

39,158. What fodder are you growing?—*Juar* and oats.

39,159. How are you disposing of that fodder?—I feed my cattle with it and I dispose of it to the cultivators.

39,160. Are you preserving any fodder at all?—Yes, as silage. I have got silage pits. I always keep 2,000 maunds in stock.

39,161. Do you find that the cultivators who work according to this plan of yours keep any milk or milk products for their own consumption?—They keep it on occasions, for marriages, feasts and so on.

39,162. Ordinarily they do not consume any milk products at all?—Those who have paid off my money can do so, if they like.

39,163. *Professor Gangulee*: Do we understand that you do not allow them to keep any milk?—In the beginning I do not allow them to keep any milk.

39,164. Even if they wanted to?—Yes; but on occasions they can.

39,165. *The Chairman*: On page 610 of your note, you are suggesting that the proper way for the Government to encourage the distribution of improved implements would be to "give some sort of subsidy to the manufacturers, who can start their own depôts, or to the leading farmers and zamindars who can undertake the work of hiring out implements, if it is made worth their labours." You do not suggest that there was any subsidy or concession behind the popularising of the cane-crushing plant, do you?—No, I do not.

39,166. *Sir Henry Lawrence*: Of what breed are your cows?—Rohtak breed.

39,167. You have never tried any cross breeding with English bulls?—No.

39,168. *The Chairman*: What happens to the calves of the she-buffaloes or cows under the charge of the cultivators?—They take them themselves.

39,169. What happens, for example, if the she-buffalo has a calf? Do you take the calf or does the cultivator take the calf?—It is the property of the cultivator.

39,170. Do you charge him for that?—No, not at all.

39,171. *Sir Ganga Ram*: What happens to the cow or buffalo when it goes dry? Does the cultivator keep it at his own expense?—Yes.

39,172. Generally, how long does it take for a cultivator to pay you for one animal?—In case he does not take any money from me he will pay the amount within one lactation period.

39,173. How much milk does a buffalo give?—10 to 14 seers.

39,174. For 10 seers he gets Rs.1-4-0; then he has to feed the animal. What is the cost of feeding the animal?—He himself grows the fodder; that he does not take into account. Then there is generally an old man in the family who collects weeds from the fields.

39,175. They give the weeds to the milch cattle?—Yes; there is a kind called *katiya* which they give.

39,176. Does he give any gram?—Yes, gram and *juar*; that is the custom in these parts during the winter season.

39,177. Do they give *binaula* (cotton seed)?—No; they give it only to those animals the milk of which is made into *ghi*.

39,178. You do not make *ghi* out of your milk?—No, not at all.

39,179. Have you made any representations to the Rates Advisory Committee which has recently been started?—No. I intend making representations to them.

39,180. They recently came to Delhi?—I did not know that.

39,181. Does Mr. Keventer feel the same difficulty about the import of these things which you suggested?—I think he has got some facilities in this respect.

39,182. Those facilities have not been given to you?—No; they are specially given to Mr. Keventer; he perhaps imports his animals in passenger trains.

39,183. Did you apply for those facilities?—No; but I am quite sure that I would not get them. I enquired from him about this and he said it is because he has been importing them for a long time that he has got these concessions.

39,184. Have you studied the question of milk canning as an industry, just as we get from Denmark?—No.

39,185. *Sir Thomas Middleton*: Were you at Cawnpore College or any other college?—I studied in the Poona Agricultural College.

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39,186. Had you any experience in this milk business before you came up to Agra?—No. This is my own scheme that I am carrying out, my own original scheme.

39,187. You were not engaged in the industry in Bombay before you came here?—No.

39,188. You employ your own milkmen to milk the cows and buffaloes; is it the duty of these men to see that the cows and buffaloes are properly fed?—It is not always their duty, because I am staying in the village myself. Generally, when an animal is not well fed, the other cultivators bring complaints to me and I go and see the animal.

39,189. Why should the other cultivators bring complaints to you?—One has got several enemies in the villages, and the enemies of the cultivator concerned come to me and complain.

39,190. The buffalo depends on the enemy for proper feeding?—The cultivator has a duty to perform; but I do not tax him to that extent.

39,191. Supposing a buffalo is getting as much fodder as it can take and is giving about eight seers of milk in the day. How much do you expect the cultivator to give in the shape of oilcake and other things?—About two seers of gram and one seer of *juar*.

39,192. You expect him to give that?—Yes.

39,193. And if you find that he is giving half of that quantity you would at once find fault with him?—I would give him *juar* and gram instead of paying him any money. When I find that they are not feeding the cattle well, I stop paying them money and give them gram and other things.

39,194. You control the treatment of the cattle in that way?—Yes, to some extent; not absolutely.

39,195. You have told us that cultivators have got to return to you all the milk that the buffalo gives until they have paid back about half the value. What happens to the calf?—The calf is their property.

39,196. But does the calf never taste milk?—It does; otherwise, how can it survive?

39,197. That is what I ask myself, because you take all the milk?—All the milk that is left after the calf gets its share.

39,198. You do allow them to bring up the calf?—Yes.

39,199. What arrangement have you made as to the amount of milk that the calf has to get?—There is no definite rule laid down. It is allowed as much as the cultivator allows it.

39,200. *The Chairman*: The more milk the calf gets the longer it will take the cultivator to pay you off?—I leave it to the discretion of the cultivator.

39,201. *Sir Ganga Ram*: Who takes the benefit of adulterating?—Nobody.

39,202. Do you use the lactometer?—It is absolutely useless.

39,203. *Sir Thomas Middleton*: Do you use the Gerber method?—Yes; I keep a record of each herd that the milkman handles.

39,204. One milkman milks from 20 to 30 buffaloes; how do you test the milk?—Over each milkman I have got a supervisor, and over these two there is another man who supervises them. A sample of each is taken, and that is regulated by the visits of the general supervisor.

39,205. You talked about growing *juar* and oats on your own land. Do you mean fodder *juar*?—Yes.

39,206. Have you any special kind of fodder *juar* in this district such as they have in Bombay?—No.

39,207. You just use the ordinary *juar*?—Yes.

39,208. Have you made up your mind as to whether you prefer green *juar* or green oats?—I prefer the green *juar*; and I make pit silos.

39,209. Have you ever had cases of poisoning in feeding with green *juar*?—Only one buffalo calf of mine died.

39,210. *Sir James MacKenna*: What are your views on the indebtedness of the cultivators? Do they get out of debt at all?—It is very difficult for them to get out of it. Marriages and similar functions take away a lot of the cultivator's money. They do not have the money for these marriages and such like festivals, with the result that they have to borrow money at exorbitant rates of interest. The rate of interest being very high, they are unable to pay back the principal and they simply go on paying the interest.

39,211. They never make any effort to pay the principal, do they?—They try to do so, but when the interest is so high they cannot afford to pay back the money. At least with my milk scheme it has been possible for them to pay back some of the money borrowed from moneylenders. But the trouble is that the moneylenders come very unexpectedly, once in a year or even after two years, and no sooner one moneylender is paid than another comes, and the cultivator has got to pay this man as well.

39,212. Have they any documents or papers to show what they actually owe to the moneylender?—The moneylenders have documents, not the cultivators. But the trouble is this, if the cultivator has taken a loan of, say, Rs.100 and has paid back Rs.60 out of that loan, he has not got any receipt for that amount, so that the moneylender again takes into account the original sum of Rs.100 lent and the interest on it.

39,213. Is there any prospect of the cultivator ever getting out of debt at all?—I think so. That is only possible provided the cultivator is given *taccavi* loans. But these *taccavi* loans should not be paid to them at seasonal times. The *taccavi* loans should be given in monthly instalments, otherwise they are prone to spend the money recklessly.

39,214. That would mean a complete revision of the principle of the Act, and that method of disbursement would considerably increase the cost of the disbursement of *taccavi*?—Yes, but that is the only solution of the whole trouble, because if you give them the money in a lump sum they will spend it recklessly.

39,215. Without any regard for the future?—Yes.

39,216. They do not worry about paying it back, do they?—No.

39,217. Can their lands be attached?—I do not know. I think that his own land can be attached, not the occupancy land, provided, of course, in the latter case the zamindar is willing to let the land be attached.

39,218. *Professor Gangulee*: Have you graduated from the Poona Agricultural College?—Yes.

39,219. When did you graduate? In 1919?—Yes.

39,220. And after your graduation you started this work?—Yes, a year after.

39,221. You sell your milk in the city of Agra?—Yes.

39,222. Are you a licensed vendor?—There is no system of licensing.

39,223. You are able to sell your entire output at the rate of 4 annas per seer?—No, at 3½ annas per seer.

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39,224. Do you pasteurise your milk?—No, I have not yet done so. I intend to purchase a machine and to pasteurise the milk in the next hot season. It is not needed in the cold weather.

39,225. How do you manage now?—At present I cover the can with a *khadi* cloth.

39,226. Has *khadi* any special virtue in pasteurising the milk?—I cover the can with a coarse *khadi* cloth and then pour water over it; on the way the *tongavallah* sprinkles water over the can and the temperature of the milk is lowered by the evaporation of the water on the covering, with the result that the milk is kept good for a long time.

39,227. *The Chairman*: Do you swing the can, or have a current of air passed over it after you have covered the can with a wet cloth?—No, the *tongavallah* sprinkles it on the way two or three times; there is no swinging done, it remains in the *tonga*.

39,228. *Mr. Kamat*: *Khadi* is suitable because it is thick like a towel?—Yes.

39,229. *Professor Gangulee*: You collect all the milk from the neighbouring farmers?—No; the village is eight miles away, and I collect the milk from within a narrow radius of the village.

39,230. And you bring your milk in *tongas*?—Yes.

39,231. You do not use the railway?—No, not at present. I intend using the railway for bringing milk from Lalkua.

39,232. I thought you said that insulated cans were broken in transit by railway?—I said that they will break owing to the rough handling of the railway people.

39,233. And you yourself have never any loss?—No, but I have seen this rough handling myself.

39,234. Your experience at the moment is confined only to the *tonga* method of collection?—Yes.

39,235. Would you give us a little more details of your organisation for collecting milk from your cultivators? How do you collect your milk? When does your morning milk supply reach the Agra city?—At 5.30 in the morning.

39,236. That milk is the evening milk, is it?—No, that is the morning milk. The milking begins at midnight. A bell is rung so as to inform the villagers round about that they must be ready with their animals.

39,237. Are these villages within a radius of eight miles?—They are within a radius of two miles from my village.

39,238. And they are eight miles from Agra?—Yes. With each milkman there is a bucket and a collecting can and with the milkman there is also a supervisor. These two men go to each cultivator and milk the animal in our own utensils, at the same time measuring the quantity of milk milked. In this fashion they go on collecting the milk from place to place. After all the milk has been so collected, it is brought to a central village, called Itara, where it is first passed through the Ulex milk strainer to remove any dirt which may have collected therein. It is finally sealed in cans and sent to the city, and here it is sold in hand carts.

39,239. On page 611 you say: "The dairy farms started in the cities to supply milk under hygienic conditions have not proved an economic success." Do you handle your milk under strictly hygienic conditions?—Of course I do.

39,240. You do not pasteurize?—Pasteurization alone does not mean hygienic conditions. I have got special utensils to deal with it; then

again the animals are kept quite clean when the people are about to milk them.

39,241. So that this is a remark based on your own personal experience?
—Yes.

39,242. And it has not proved an economic success?—My business is an economic success.

39,243. But you say that the dairy farms started in the cities have not proved an economic success?—I mean dairy farms kept within the city limits.

39,244. You do not have any cattle under your own direct management?—At times I do have.

39,245. You distribute to the cultivators the fodder that you grow and the silage that you preserve?—I have taken to silage preparation only from this year, and it is only for the last month or so that my animals are having the benefit of it.

39,246. Do you get any supply of oilcakes?—Yes, we have got an oil mill and we get our oilcakes from it.

39,247. *Mr. Calvert*: What about the covering of the buffalo cows? Do you keep a special bull?—I have got a Murrah bull from the Government farm.

39,248. Are you taking an interest in the breeding of these buffaloes?—Yes, as I have got a bull I am taking an interest in them. The breed is improving and this bull is controlling about ten villages in my vicinity.

39,249. Will you not have to change that bull soon?—No.

39,250. To prevent it covering its own offspring?—I do not think I shall have to change the bull.

39,251. I understand that these buffaloes become the property of the cultivator even before he has paid for them?—Of course, they will become his property if he pays back the remaining portion of my money either in cash or in milk.

39,252. Does the property remain with you until he has paid off the loan?—The property remains with him.

39,253. That is to say he has to pay for it on the instalment system?
—Yes.

39,254. Are the buffaloes ever attached by moneylenders in execution of decrees?—Yes, they are attached. I do have cases of this sort where the buffaloes are attached by the moneylenders. But I have one distinct advantage. *Mr. Pragnam*, who is the leading lawyer of this place, is a relation of mine and as all the moneylenders are afraid of him, naturally they do not trouble me.

39,255. So you do not suffer any loss on that account?—Of course, I am not suffering any loss, but I am afraid of them. I think myself that some legislation might be introduced for this purpose. The cultivator, at any rate, is a loser in this respect.

39,256. Do you guarantee the purity of your milk?—Yes.

39,257. Do you use preservatives?—No.

39,258. Who buys this milk? Indian or European gentlemen?—I think there are some European gentlemen too who buy the milk.

39,259. Who are the majority of your purchasers?—Indians.

39,260. *Mr. Kamat*: In this system of yours of placing these animals in charge of the cultivators without obtaining any written documents from them, and depending throughout on their good faith, both in taking

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the milk from them and in giving them the cattle food, are you not more or less following unbusinesslike ways?—Yes, it is unbusinesslike.

39,261. Supposing any other man who had no facilities or who had no lawyer friend such as you have, were to invest, say, Rs.20,000 in 200 buffaloes and were to distribute the animals among 200 cultivators and simply depended on their word for the milk and the upkeep of the cattle, would not such a man be entirely at the mercy of these people?—Yes, not only at the mercy of these people, but also at the mercy of the moneylenders.

39,262. You say this system could be copied by other people at a profit?—That is what I am giving to the tenants, and if others like to do so they can have written documents from the tenants.

39,263. If you begin taking written documents, will the system work as well as it is working in your case?—Of course it will; the cultivators have no objection to giving documents.

39,264. You say the system also works to the advantage of the consumer. I want to know how that is the case? You are selling milk at 3½ annas a seer?—Yes.

39,265. What is the ordinary rate from the *gowalas*?—Four or five annas. In some cases it is 2½ annas in Agra itself, but that depends on the purity of the milk.

39,266. Then you are selling in some cases cheaper than the other *gowalas*?—Yes; when I started my work the price of milk throughout the city was 5 annas a seer.

39,267. You have brought it down by half an anna?—No; generally in the city it is 3 annas and even 4 annas; in places where my cart does not reach it is 5 annas.

39,268. We are told that the method for checking adulteration of milk would be by some sort of legislation or licensing by the Municipalities. In the Agra Municipality is there any check on adulteration?—No, there is none, but I intend suggesting something.

39,269. Supposing municipal law or legislation is introduced to check adulteration, what would be the effect on the milk market?—If adulteration is absolutely stopped, the first difficulty in the market will be that most of the people who are now selling milk would shut down and there would probably be an increase in the price of milk.

39,270. To what extent?—I cannot say.

39,271. Will the price be prohibitive to the ordinary middle-class man or the poorer man?—It all depends on the strictness of the legislation; if the legislation is very strict and is immediately enforced throughout India, I think prices will go very high, but if it is applied gradually from district to district and there is some other organisation to supply pure milk, then the price may be kept down. In Agra, where you have another organisation to supply milk, the prices will be all right, but in other cities, if you check adulteration, there are people who will shut down and who will not engage in this business when they see that adulteration has been checked, and then prices are sure to rise high.

39,272. Would the checking be very effective? How many supervisors would the Municipality have to employ?—I doubt the honesty of the supervisors.

39,273. Would prosecutions be successful?—I do not know. The prosecutions will be quite successful if they are honestly done; it all depends upon the character of the supervisors.

39,274. You spoke of the moneylenders and their system by which they do not give any receipts for repayments. Do you not think as long as the cultivator is illiterate he will be unable to protect himself?—Of course, he will not be able to protect himself as long as he is illiterate and no receipts are given.

39,275. But some mitigation of the nuisance might be effected by legislation; for instance, there should be account books with printed pages and a penalty should be imposed on moneylenders who do not give receipts?—I think there is already a provision for a penalty if the moneylender does not give receipts.

39,276. But that is not insisted upon by the borrower, because he is always in need of money?—One difficulty is, that if you invent a substitute for the moneylender, the moneylender will at once require the repayment of his money, and the cultivator will be left at the mercy of God.

39,277. That means that the borrower needs the moneylender with all his tricks?—Yes. I have seen cases in which the cultivator only takes Rs.20 from the moneylender, but the moneylender gets a document from him for Rs.50.

39,278. So that his need is such that he puts himself in the hands of the moneylender with his eyes open?—Of course he does, when he has no other means of satisfying his needs.

39,279. Have you any suggestion to make with regard to this?—The only suggestion I have to make is that the cultivators must not get money in a lump sum; if they get money in a lump sum, they are sure to misuse the credit that is given to them.

39,280. That is owing to illiteracy and lack of intelligence?—You cannot change that state of things quickly; it will take a long time to educate them to that extent.

39,281. When you give them advances in lump sums, what happens?—I do not give them advances in lump sums; I generally give them advances in accordance with their requirements.

39,282. In fact, you suggest giving dribblets of Rs.5 or Rs.10?—Yes, not more than Rs.20.

39,283. *Professor Gangulee*: Do you not take any document from them for the money you give them?—No, I do not, because I have got good facilities; the cultivators have complete faith in me, and I have great faith in the cultivators.

39,284. *Mr. Kamat*: And there is the great dread of your relative?—Yes.

39,285. *Professor Gangulee*: Do you know of any city in which municipal inspection is working efficiently?—I do not think it is working efficiently anywhere.

39,286. What is your total output of milk?—This year it is 10 maunds a day.

39,287. Your suggestion is that 10 maunds of milk in the City of Agra has affected the position so much that it has reduced the rate from 5 annas to your price?—Yes.

39,288. *The Chairman*: Can you give us any indication at all as to how many cultivators have succeeded in paying off the value of the animals obtained from you? Have 50 succeeded in doing so?—I cannot say accurately how many. I think about 40 have succeeded in paying back.

39,289. 40 in four years?—Yes.

39,290. I think you want to make a statement now?—The first thing is that milk should be licensed; the sale of adulterated milk must be allowed to go on, but there must also be licensed milk.

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39,291. You mean certificated milk guaranteed by the Government?—Yes.

39,292. That milk would be subject to inspection?—Yes, it would be inspected by the milk chemist periodically, once in a fortnight at least, and he must publish the analysis of the milk.

39,293. Is that to ensure value for quality to the producer?—Yes; it will ensure the quality of the milk for those consumers who can pay a good price and at the same time are intelligent enough to realise the value of good milk.

39,294. It will ensure quality to the consumer, but is it also the idea that it will ensure value for quality to the producer?—No. Take, for instance, my own milk which I am selling at 3½ annas a seer; what I mean is that in Agra there must be two grades of milk: licensed milk "A," and licensed milk "B"; the fat percentage must be the determining factor; milk containing over 7 per cent. of fat must be classed as Grade "A," and milk containing from 6 to 7 per cent. as licensed milk "B"; the milk must be sold in the market under those classifications. Any milk which does not contain 6 per cent. must not be classified as licensed milk. The chemist, when he has analysed the milk, must publish the result in poster form in the city so that the educated consumer may know the quality of the milk that is offered; otherwise we shall not be able to compare our milk with that of dishonest traders. The difficulty we are in is that these people are selling separated milk here and they say the testing machine gives good readings with it.

39,295. What is your next point?—The vegetable *ghi* that is coming into India is adversely affecting the dairy industry; this year the price of *ghi* has fallen to 12 *chattaks* a rupee, which, I think, is due to the sale of this vegetable *ghi*. This means a loss to the cultivators and the dairying industry is becoming unprofitable.

39,296. What suggestion have you to make?—To my mind the importation of this vegetable *ghi* into India must be absolutely prohibited by a very prohibitive duty being put on it. In Agra the Municipality has imposed an import duty of Rs.25 per maund on vegetable *ghi* imported into the city; but the trouble is that *ghi* is being imported into the rural areas, and they are adulterating pure *ghi* with it and bringing it into the city.

39,297. I think you have given us your views about indebtedness. Your point was that *taccavi* loan should be disbursed in small amounts?—Yes.

39,298. *Sir Henry Lawrence*: Is this vegetable *ghi* injurious to health?—I cannot say it is, medically, but I think it is injuring the health of the people; most of the people have an objection to it.

39,299. What is it made of?—Vegetable oils, olive oil. My brother is an expert in this industry.

39,300. *Sir Ganga Ram*: I understand you to say it is mostly used, not in its pure state as it is imported, but for adulteration purposes?—It is used almost always for adulteration purposes.

39,301. *Sir Henry Lawrence*: You say it is imported?—Yes, it is all imported.

39,302. Is it not also made inside India?—Yes, it is made in India, and that should be prohibited too, because it is filling the pockets of a few men at the expense of the whole of the cultivators in India by decreasing the consumption of ordinary *ghi*. There are people who object to taking *ghi* because they cannot rely on its quality.

39,303. *Sir Ganga Ram*: Some of it is said to be made from coconut oil; on what grounds can you prohibit that? If you can prove it is used

for adulteration, then there is some case for prohibition?—But can you not stop it on economic grounds?

39,304. *Sir Henry Lawrence*: Are you proposing to compensate the people who make this substance?—I think they must be compensated, and then the production should be stopped absolutely.

39,305. *Mr. Calvert*: Is petroleum jelly used to adulterate *ghi*?—I do not know.

39,306. *Sir Ganga Ram*: Is emulsified petroleum also used to adulterate *ghi*?—I do not know.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Friday, the 18th February, 1927, at Delhi.

Friday, February 18th, 1927.

DELHI.

PRESENT:

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

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

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

Mr. R. OAKDEN, I.C.S., Commissioner, Meerut Division.

Replies to the Questionnaire.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) (1) *The distribution of improved seed.*—This is usually done from seed depôts. There are complaints of delay, especially when grain is supplied on *taccavi* terms, and of supply of poor quality seed.

A case of this kind came to my notice recently in Saharanpur, where the Collector saw the seed (wheat) and found it inferior to locally obtainable seed. Another complaint is that the grain obtained from improved seed is not up to the standard of the parent seed, and deteriorates at each successive harvest.

(2) *The adoption of the Persian wheel.*—This has been most successful in parts of the western districts of the Province and is spreading. It is better for the bullocks, saves the labour of one man and is cheaper. Quite an industry in making iron wheels and iron buckets to replace the old wooden wheels with earthen pots is spreading in some towns, e.g., Saharanpur, Nakur in Saharanpur and Shamli in Muzaffarnagar.

(3) *The use of improved ploughs.*—The iron plough supplied by the Agriculture Department is becoming popular. Actual figures for its supply can be given by that department.

(b) Demonstrations to be really effective must be made in the villages so that cultivators may see the results of improved methods side by side with those of the old methods.

(c) Cultivators are willing enough to follow expert advice if they are satisfied that it is sound. Mere preaching without demonstration is useless.

Instruments, seed, &c., might be supplied free or at reduced rates to approved men who are willing to experiment with them in their own villages.

QUESTION 4.—ADMINISTRATION.—(c) (iii) Agriculture in this Province suffers from lack of good roads and insufficiency of roads. Many villages are ten miles or more distant from any recognised road, and are dependent on village tracks. Unmetalled roads are generally very bad and are very difficult to keep in repair.

Repairs can only be done effectively at the end of the rains before the ground has dried. They are usually done too late, if at all, and the dry earth thrown down is quickly pulverised and blown away.

The breaking of culverts owing to failure of repairs is becoming serious.

Village roads or tracks connecting villages with recognised metalled or unmetalled roads are extremely bad and are under no system of control or management. They belong nominally to the owners of the villages through which they pass, but they are mostly uncared for and neglected. Occupiers of adjoining fields encroach on them and cut them or traverse them with irrigation channels. They are frequently below the level of the fields and become watercourses in the rains, and if they are cut or damaged by traffic or running water there is no authority responsible for their repair. Such repairs as have to be done are usually done by cartmen whose carts cannot otherwise proceed.

There are two remedies:—

- (1) The extension of recognised roads.
- (2) The formation of some local authority.

QUESTION 8.—IRRIGATION.—In 1921 a scheme for increasing the supply of water in the Betwa canal, Jhansi, was drawn up, but I do not think that it has ever materialised. It provided for catching the surplus water of the river Betwa by the construction of a second *bund*, and seemed a sound and desirable scheme.

QUESTION 10.—FERTILISERS.—(e) There are several kinds of nitrates on the market, but they are not much used. Some kinds can be made in India, and are cheap enough for a small landholder. From 1 to 3 maunds are required per acre, and the cost of a maund of sodium nitrate, calcium cyanamide and sulphate of ammonia is about Rs.9 at Saharanpur. They could probably be sold cheaper if Government would interest itself in the manufacture and distribution. The use of some kinds is tricky, and cases have come to my knowledge in which damage has been done either by using too strong a mixture or by using it without sufficient irrigation. The simpler kinds only should be popularised and full instructions should always be given.

Mr. W. M. Griffith, Executive Engineer, Eastern Jumna canal, Saharanpur, is much interested in nitrates and is carrying out experiments. I suggest that he be asked to prepare a note for the Royal Commission.

QUESTION 19.—FORESTS.—(b) More use should be made of canal banks for trees.

QUESTION 22.—CO-OPERATION.—(a) (i) In 1925-26, I was president of a committee* of enquiry into the co-operative movement in the United Provinces. The committee's report has been published. The chapters and paragraphs quoted in my answers below relate to this report.

Government (Chapter XIV) should help—

(1) By declaring and making it clear that co-operation has its strong support. This was done in the Punjab and was one of the causes which led to the success of co-operation in that Province. I might add that Sir Michael O'Dwyer in his book on India attributed the prosperity of the Punjab to three causes—canal irrigation; the Land Alienation Act, and co-operative societies.

(2) Financial aid. This must be liberal if success is to be achieved, and can best be given in the form of an efficient staff for controlling, guiding and supervising societies. Strictly speaking, co-operative societies should provide for their own supervision, &c., but in India, unlike other countries, co-operation was started by Government and, therefore, can fairly expect Government aid in control and supervision. In the United Provinces less public money has been spent on co-operation than in any Province (paragraph 88).-

(3) By concessions (paragraphs 89 and 90).

(4) By loans (paragraph 61 and 91).

*Report of the Committee to enquire into the Co-operative Movement in the United Provinces (Oakden Committee's Report), 1926.

(5) By instructing the officers of all departments, especially District Officers and their assistants, to encourage the movement (paragraph 92).

Many officers do not know what co-operation is. To remedy this, Government should supply them with a few simple books.

(ii) Non-official agencies, in which I include Municipal and District Boards, should help—

(1) Generally by increasing facilities for primary education and by improving road communications.

(2) By encouraging the formation of societies among their employees and by encouraging school teachers to assist the movement as secretaries or members of societies. Teachers in this Province usually take no interest in local societies, though they could do much to remove that at present necessary evil, the group secretary.

(3) By depositing their surplus cash and provident funds in Central Banks and by accepting deposit receipts in lieu of cash deposits from contractors and employees. (Paragraph 93.)

(4) By contributing to the pay of organisers and supervisors. (Paragraph 93.)

(b) (i) Most of the societies in the United Provinces are credit societies, and a considerable part of the committee's report relates to such societies, *vide* Chapters II, III, IV, V, VI and VII. My views about them are given in paragraphs 10, 15, 22, 23, 24, 27 and 29.

(iii) Societies formed for the sale of produce or stock. (Paragraph 58.)

(v) Societies for the consolidation of holdings. (Paragraph 54.)

(vi) Societies for the co-operative use of agricultural machinery. No such societies exist in the United Provinces, but their formation is recommended. (Paragraph 52.)

(viii) Cattle-breeding societies. One such society was formed in the United Provinces, but failed. (Paragraph 48.)

(c) Compulsion by legislation is contrary to the co-operative spirit. I am opposed to it in theory, but, if experience shows that the views of the majority are frequently thwarted by a small minority, legislation might be desirable. If there is such legislation, the law should provide that the minority to be coerced should be very small.

(d) My experience, which is based mainly on inquiries made by the Co-operative Committee and on statements made before it, is that they have in the main not achieved their object in the United Provinces. Failures are numerous, and a lack of vitality is manifest. If benefits had been more real the movement would have spread by its own momentum, and, after a life of over twenty years, it would not still require so much outside stimulation. (Chapters II, III, IV, V, VI, VII, VIII and IX.)

Oral Evidence.

39,307. *The Chairman*: Mr. Oakden, you are Commissioner of the Meerut Division?—Yes.

39,308. Amongst other services you were Chairman of the Co-operative Committee of the United Provinces of Agra and Oudh which sat in 1926?—Yes.

39,309. Have you had any other direct association with the co-operative movement?—None except as a District Officer.

39,310. To what extent in your view is the District Officer responsible, in a broad sense, for the economic development of his district?—He used to be regarded as the initiator of everything in the district, but that in the later days is beginning rather to pass away.

39,311. Do you regret the passing of that view?—Yes, I do in a sense. The District Officer is becoming more divorced from the actual life of the

people owing to the creation of non-official District Boards and the development of other departments and so on. It is inevitable, I suppose.

39,312. Do you not think that during the stage of transition it is important that District Officers should be encouraged to keep up their interest in the economic well-being of the population as long as possible?—I certainly think it is most important.

39,313. You do not think that one of the immediate effects of the Reforms is to tend to make the District Officers to lose sight of that responsibility a little before they need have done?—I think it was so in some cases but I do not think it is universal.

39,314. It must take time before the District Board, for instance, and all the machinery of representative Government can come to mean very much to the individual cultivator?—Yes. The Reforms came at a very unfortunate time. They came into being during non-co-operation when it was considered quite wrong to go and consult the Collector. There is a great change coming over them now, and we now find that the District Officers and Commissioners are consulted very much more by Boards and individuals.

39,315. The political conditions of the moment tended to harden the line between the new representative system and the Collector system?—The new Boards wanted to disregard the Collector and to stand on their own feet; they have now begun to find that they cannot do so in very many cases and they now begin to welcome the help and advice of the District Officer much more than they did three or four years ago.

39,316. To turn to your note, is there anything that you would like to say at this stage in addition to that which you have written in your note of evidence?—I do not think I have anything extra to say.

39,317. There are no corrections in the printed note which you wish to make?—No.

39,318. With regard to seed you say: "There are complaints of delay, especially when grain is supplied on *taccavi* terms, and of supply of poor quality seed." Have you ever heard of any charges of corruption in relation to the conduct of these depots?—No; I have not heard of any charges of corruption.

39,319. There has been no suggestion that seed of inferior quality and value was being issued as improved seed?—No; I have never heard of it in that form, i.e., that it was due to direct dishonesty.

39,320. On page 625 of your note, you point out that agriculture suffers from lack of good roads and insufficiency of roads. You are thinking of roads in the charge of the District Boards?—Yes, mainly, except when I speak of village roads.

39,321. Are the District Boards in financial difficulty?—More or less; but they are always very ready to spend money on things on which they want to spend. They do not like to spend money on roads for some reason.

39,322. Do you think that it is within the power of District Boards, if they choose, to levy the necessary taxation to give such revenue as they require to discharge their duties and responsibilities?—In the case of some Boards it would be quite impossible.

39,323. The money is not there?—No, the money is not there; they largely depend on Government grants. That would apply specially to all hill districts and in the case of others it really depends upon what degree of efficiency is to be attained.

39,324. Is there great reluctance to levy taxation in some cases?—Yes, there is. At the same time a good many Boards in the United Provinces

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are beginning now to apply the tax on "circumstances and property," without which they are not allowed to raise the cess. It is a sort of general property tax. If they introduce that tax then they are allowed to raise the cess.

39,325. What is the definition of "circumstances" when used in that sense?—It means a tax on the man's general condition, and practically almost comes to income-tax.

39,326. *Dr. Hyder*: Is it not really paid by the people who are below the income-tax limit?—It is leviable on every one.

39,327. But in the districts generally there are a number of people whose incomes are above Rs.2,000; they get all the benefits and pay nothing?—Yes; but this tax is leviable also on those who pay income-tax in addition to their income tax. It is purely a tax levied by the Local Boards.

39,328. *Sir Henry Lawrence*: Has the word "circumstances" any legal definition?—It is one of the well-known taxes in this Province.

39,329. Is it an old term in this Province?—Yes, it is. It is a tax on the man's general well-being.

39,330. *Sir Ganga Ram*: Is there any limit to it beyond which it is not levied?—I have forgotten whether there is actually any limit to it; but the rules have to be sanctioned by the Government and a limit is always applied.

39,331. *The Chairman*: Does any particular class in fact control the District Boards in the rural areas in the Province?—The power is getting into the hands of the small landholder in some places at any rate.

39,332. Not the big man?—Yes; in areas where the big man is powerful he can still hold his own; but I think the bulk of the members belong to the small landholding class.

39,333. Will the tax on "circumstances and property" fall mainly on these small landholders?—No, it would not fall on them at all, because income from land which is subject to land revenue is not assessable; they pay a tax in the cess which is a tax based on the land revenue.

39,334. So that, perhaps, it is not surprising that a body which is mainly controlled by small landholders favours this particular tax?—They do not favour it; but it is the necessary preliminary to increasing the cess. It is meant to fall really on the money lending and trading classes of the agricultural area.

39,335. Let me put the question directly. Is there disinclination on the part of small landholders who have power on District Boards to tax themselves and to make a fair contribution towards the expenses of the Boards?—It is not very noticeable.

39,336. *Sir Henry Lawrence*: The disinclination is not noticeable?—There is a general disinclination to introduce taxation because it is unpopular. The members keep an eye on future votes and do not like to do anything unpopular. At the same time a good many Boards are beginning to introduce this tax. Three out of the five districts in my Division are introducing it. The tax on "circumstances and property" is a preliminary to increasing the cess.

39,337. *Sir Ganga Ram*: What is the translation of "circumstances"?—It is *haisyat*.

39,338. *The Chairman*: You say it is a preliminary to increasing the cess?—Yes.

39,339. How soon does the increase in cess follow?—They have got to do it by a separate resolution, but it is supposed to follow at once. We have not so far actually raised the cess anywhere.

39,340. That is for the local expenditure?—Yes.

39,341. Is it the case that where the tax on "circumstances and property" has been levied and where the increase in cess has not followed, the small landholder makes no increased contribution?—It is too early to say that the cess would not be increased. No Board in my Division has yet begun to collect this new tax.

39,342. If you accept by hypothesis that is so, is it?—Yes, I think it would follow.

39,343. Automatically?—I think it is intended to follow.

39,344. *Sir Henry Lawrence*: On what is that based?—It merely increases the percentage of the cess.

39,345. Do you think an additional cess on land is likely to follow?—Yes.

39,346. Is there any agreement with the Local Board that the Government will not sanction the tax on "circumstances and property" unless an additional cess is levied on land?—I do not think it is part of any agreement.

39,347. It is just your opinion of what would be the probable result?—Yes; because otherwise it was feared that they would all raise the cess as it is a very easily-collected tax, which Government collects and credits into the Treasury with the land revenue.

39,348. Who entertained the fear that they might give further taxation to themselves and not tax the trading community?—The Government.

39,349. Government were afraid that they might tax themselves and not the traders?—Yes, because it is so much easier to raise the tax.

39,350. *The Chairman*: On page 626, in answer to our Question 10 about fertilisers, you suggest that Government should interest itself in the manufacture and distribution of certain chemical fertilisers, that they might be sold at a cheaper rate to the cultivator. On what did you found yourself when you suggested that? Would you like to see Government embark in this field?—In India, I do not think anything new will progress unless Government helps it; it wants Government help to start, and that is the general idea upon which it is based.

39,351. Are you familiar with the campaign that is going on at the moment for popularising fertilisers in India?—I have only a very general knowledge of it. I know that certain companies are trying to popularise them.

39,352. Do you know that in the matter of seed distribution many persons in responsible positions in the Agricultural Departments are most anxious that private enterprise should take up the business of seed distribution?—I should myself agree with them, not only in regard to this, but also in regard to everything else, if they could only get it done.

39,353. *Professor Gangulee*: Are you thinking of a Government subsidy in the manufacture of fertilisers?—I am thinking not so much of a Government subsidy as Government help and encouragement.

39,354. *The Chairman*: At the top of page 627, you suggest that, in order to give officers an opportunity to teach themselves co-operation, Government should supply them with a few simple books. Do you mean paying for existing books or having new books written?—No, I meant existing books.

39,355. Does that chime with the practice of the service? Do officers expect to be provided with books on subjects of this sort?—I think if they were not supplied most of them would not get them, and if they got them it would be rather difficult in many cases to get them to read the books.

39,356. It is hardly a point for Government distributing them?—No, it would not be, but still it would help.

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39,357. I do not know whether you would wish to put before the Commission anything on co-operation which is not contained in the Report that is generally referred to by your name?—I do not think so.

39,358. It struck me that in the matter of the future policy as to the granting of *taccavi* loans and their effect on co-operative credit, you might wish to say something. Do you hold that Government should pursue a policy of granting *taccavi* loans only through co-operative credit societies where those societies operate?—Not only through them.

39,359. Even in districts where credit societies are active?—I would not limit it to that.

39,360. Probably it is within your knowledge that there are some persons who hold the view that that limitation should be imposed. You do not think that *taccavi* loans are apt to compete with credit societies if the practice that you suggest is followed?—I do not think so.

39,361. *Sir James MacKenna*: You had no connection with co-operation before this present Committee?—No.

39,362. Might I ask what general impression did you get of the co-operation movement in the United Provinces apart from the conclusions expressed in the Report?—As is stated towards the end of the Report, it was stagnant and entirely lacking in vitality.

39,363. The general impression which you formed was a feeling of disappointment; is that so?—Yes.

39,364. Had you that impression as a District Officer before you embarked on this particular enquiry? What impression did you form of it as a Collector and as a Commissioner?—My impression of it was much better when I began the enquiry than when I ended it; that is with regard to the United Provinces.

39,365. Do you think that at this stage another general enquiry on the lines of the Maclagan Inquiry (which is now nearly twenty years old) into the whole movement in India, would be a sound thing, assuming that other Provinces may have the same conditions as you discovered in the United Provinces?—I do not feel qualified to answer that question; but I think probably on the whole it would be, although the circumstances have altered in that the subject is now a provincial "transferred" one.

39,366. Your Committee did not approve of the idea of appointing a Development Commissioner, but suggested the creation of a Board to co-ordinate the activities of the Agricultural, Co-operative and Industries Departments. Has that Board been formed?—I do not think so.

39,367. What was your idea of the composition of that Board?—I do not think we have entered into any details.

39,368. Do you think that agriculture and co-operation should be under one departmental head?—I think myself that it would be very good for co-operation if they were.

39,369. That would be a biggish job, would it not?—Yes, it would be. Of course, indirectly they come under the same Minister, but that does not really co-ordinate them.

39,370. I think the United Provinces Government definitely turned down the proposal?—That question was still pending when we reported, because it was one of the points they asked us to mention.

39,371. *Professor Gangulee*: Did you find in the course of your inquiry that there was adequate co-operation between departments such as Agricultural, Industries, Co-operative Societies, and so on?—Co-operation was certainly lacking.

39,372. And your suggestion for a Board, to which Sir James MacKenna has just referred, was made with the idea of bringing about the desired co-ordination?—That was the hope.

39,373. Are you not aware of the Provincial Development Board that was set up by the United Provinces Government?—I do not know anything about its activities; it must be an Industrial Development Board as far as I remember.

39,374. You think that the formation of a Board would help to bring about the co-ordination that you seek?—Yes, I think it might.

39,375. Under one Minister?—It would want something more than the Minister to bring them together. As you will see from the note of the Director of Agriculture which we published, the Co-operative Department was given up by him in disgust. He said that he could not do anything with them because they were useless.

39,376. Could you tell us why the suggestion for a Development Commissioner was turned down by the Government?—I do not know.

39,377. In your inquiry what was the chief trouble in the matter of supervision? Was it inadequate supervision or was it imperfect supervision?—Both inadequate and imperfect.

39,378. We were told that the centralisation of authority in the Central Banks is largely responsible for the lack of vitality in the co-operative movement with regard to primary societies. How would you bring about decentralisation of authority without losing the efficiency in management? Have you any alternative suggestions to make?—We think that it ought to be taken away from the Central Banks.

39,379. Would you set up another organisation for supervision on the lines of the guarantee unions which exist in Burma?—I do not think that anything will be really effective except a strong official staff at present. Ultimately some other form of control may be developed.

39,380. Do you see any indication of village panchayats being interested in the co-operative movement?—They are in certain places, indirectly. We have not got any regular panchayats in the United Provinces.

39,381. Have you not panchayats of the co-operative societies?—Yes.

39,382. Do you know of any primary society in the United Provinces where the secretary is the village schoolmaster?—There are a very few; the village schoolmaster as a rule has kept entirely aloof and no effort has been made to bring him into the movement.

39,383. Why has he kept himself aloof from this movement?—I do not think anybody has bothered about him.

39,384. Do you think he could possibly be utilised for the improvement of the primary societies?—It would be necessary to interest him in co-operation first, and no attempt has been made to do so.

39,385. What is the attitude of the landholders towards the co-operative movement?—They are not hostile to it; they are, generally speaking, friendly.

39,386. What is the attitude of the District Boards?—The District Boards care nothing for it and have no concern about it at all.

39,387. What is your view on the question of land mortgage banks in the United Provinces?—My views are those which we put in the Report.

39,388. You do not think the time has come for establishing land mortgage banks?—The time has not come in the United Provinces to start any new thing on co-operative lines; we have got to build the foundation much firmer before we can start anything new.

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39,389. With regard to the training of the co-operative officials, would you prefer to have graduates from the agricultural colleges?—Yes, I think that would be very sound indeed; but they will want a co-operative training as well.

39,390. On page 626, you mention two remedies: the extension of recognised roads and the formation of some local authority. What have you in mind when you speak of the formation of some local authority? Do you want to have a District Road Board or something of that sort?—It would have to be something infinitely smaller than that, something more like a combination of a few villages. These roads get cut and knocked about and no one repairs them; no one thinks it is their job to do it; there is no authority to do it at all.

39,391. And you want that authority to be invested in a small committee of the District Board; is that it?—No, I would cut the District Board out of it altogether.

39,392. Who is going to have this authority?—Either the village or a combination of villages.

39,393. It is not quite definite in your mind?—I have not formulated a definite scheme.

39,394. *Mr. Calvert*: On page 16 of your Report you give a list of the main defects in the organisation of co-operation, and you put the failure to explain the principles of co-operation at the very end?—Yes.

39,395. Is that put there in order of importance?—No, it was not in any order.

39,396. Would you put that first in order of importance?—Yes, I think I should put it first.

39,397. On page 30 of your Report, you say the study of rural problems should occupy a far higher place than it does among the interests of the Co-operative Department. Do you consider the study of rural problems as carried out in the Punjab would be useful in the United Provinces?—I think it would be most useful.

39,398. You told Professor Gangulee that the United Provinces required a strong staff?—Yes.

39,399. Were you thinking there of a staff strong in numbers or strong in co-operative training?—Strong in co-operative training, and certainly numerically stronger than it is now.

39,400. The main thing would be a better trained staff?—Yes.

39,401. You have more or less recommended the Punjab system of training for the staff in these Provinces?—Yes; I think we recommended it very strongly.

39,402. You had before you one of our Assistant Registrars as a witness, Sardar Ikbāl Singh?—Yes.

39,403. An ordinary Jat, but an M.A. in economics?—Yes.

39,404. Do you think that if you had that type of man in these Provinces you would be able to make a better success of co-operation?—Yes, I am sure we could.

39,405. *Sir Henry Lawrence*: Have not you got Jats in these Provinces?—Yes, but unfortunately our Co-operative Department is mainly recruited from the towns; that is one of its difficulties; I do not think we have got a single Jat in the whole department.

39,406. Have you got any Jat M.A.'s?—Yes, and we have quite a number of Jat Deputy Collectors and Superintendents of Police; they are available all right.

39,407. *Mr. Calvert*: You had the opportunity in the Punjab of seeing the staff there?—Yes, I saw a fair number of the staff.

39,408. And I think you formed a favourable impression?—Yes.

39,409. That is the kind of staff you are advocating for these Provinces?—That is the kind of staff I had in my mind.

39,410. On page 626 of your evidence, with regard to financial aid, you say financial aid can best be given in the form of an efficient staff for controlling, guiding and supervising societies. I notice that you miss out the word “educating”; did you really mean to include education?—That omission was not intentional; I would certainly add the word “educating.”

39,411. Would you say the best way Government can aid this movement is by providing an adequate staff for educating the people in co-operative principles?—I think I would add these other points; it all comes to much the same thing.

39,412. But is not the idea of education to dispense with the need for control, guidance and supervision?—It is ultimately; I was thinking more of present conditions.

39,413. *Mr. Kamat*: I wish to ask you a question by way of comparison between the position of the co-operative movement in the United Provinces and in the neighbouring Province of the Punjab. You agree that the Punjab is ahead of the United Provinces in co-operative matters?—Yes, vastly.

39,414. In both Provinces the departmental agency is practically the same, the law, I mean the Co-operative Act, is just the same, the position of the Local Boards is practically the same. How do you explain the phenomenon that in one Province the co-operative movement is so stagnant while in the neighbouring Province it is so far ahead?—It is mainly due to the fact that in the one Province it was guided and led by men who understood and knew co-operation, while in the United Provinces it was not.

39,415. *Professor Gangulee*: It is chiefly due to the personnel of the movement?—In the one there was a body with brains behind it while in the other there was a body with no brains behind it.

39,416. *Mr. Calvert*: I hope the Punjab is the one that had brains behind it?—Yes. When I say “brains,” I mean knowledge of co-operation.

39,417. *Mr. Kamat*: You mean that in the United Provinces there is not the zeal for ensuring progress in the co-operative movement; that is what you mean by lack of brains?—It is lack of knowledge rather than lack of brains; the Co-operative Department from the Registrar downwards do not understand co-operation.

39,418. On page 627, you say Government should help by instructing the officers of all departments, especially District Officers and their assistants, to increase the strength of the movement, and you say “many officers do not know what co-operation is.” Does that apply to all District Officers?—It applies to most of them; it certainly applied to me personally when I began this enquiry.

39,419. At the beginning of your remarks in answer to the Chairman, you said that at the present moment and at the present transitional stage after the Reforms the District Officer does not feel himself responsible for the economic development of the villages, and he is divorced from them?—Not so much as he was.

39,420. Has this attitude something to do with the lack of progress in the Co-operative Department in the United Provinces?—I do not think so.

39,421. Is that the general mentality also of the members of the Co-operative Department, that they feel they are not directly responsible for

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the welfare of the villages?—I do not think they have any ideas of rural uplift; I do not think they have any ideas outside the societies.

39,422. With your experience on this Committee and also as a District Officer, do you think this uplift could be brought about mainly by Government agency, even if the District Officer were to be supposed to be entirely responsible for rural welfare? I mean, supposing with regard to rural uplift a great deal of spade work has to be done by propaganda work, such as educating the villager how to live a sanitary life, improve his amenities and that sort of thing, can Government agency undertake that sort of work universally?—No, not alone; I do not think they could possibly do it; it would require a vast amount of assistance and helpers in every district and in every area.

39,423. You think, therefore, that it is the joint work of the District Officers, who must have zeal and enthusiasm for that sort of work, and also it is the work of outside helpers?—Yes, certainly.

39,424. I should like to understand the position of the District Local Boards with regard to roads. I understood you to say that they did not wish to spend money on roads. Would you explain why they are dissociated in any way from roads?—One of their responsibilities is metalled and unmetalled roads.

39,425. Why do they not desire to discharge that responsibility?—One reason is that they are unable to spend enough; whatever they could spend would not be sufficient. Moreover, they prefer to spend money on education and other activities. They are not interested in the roads.

39,426. Is it your opinion that they have unwisely preferred expenditure on education to expenditure on roads?—No, I do not say unwisely.

39,427. You do not place roads before schools?—No. I do not think you should close schools in order to improve the roads.

39,428. But do you think it would be wise not to extend schools in order to improve the roads?—No, I would not go so far as that.

39,429. There has been some deterioration in the roads, and you think that is inevitable?—To a certain extent it is, because these roads have now been thrown on to the Boards, and the Boards have not, in many cases, the proper staff for keeping them up. These roads used to be under the Public Works Department, and now they are under the District Board Engineer, who has no one over him.

39,430. That is just the point I wished you to explain to us. Has it been the policy of Government recently to transfer the upkeep of roads from the Public Works Department to District Local Boards?—Yes, in the case of what are called local roads, as distinct from provincial roads. The local roads have been handed over entirely.

39,431. These local roads were previously maintained by the Public Works Department?—Yes, but the expenditure passed through the books of the District Boards. The allotments were made by the District Boards.

39,432. When you say the upkeep has been thrown on the District Local Boards, do you suggest any additional expenditure has been thrown on them?—No, there has been no additional expenditure.

39,433. Then there is no reason why the District Local Boards should not maintain those roads in as good a condition as before, except for the inefficiency of the staff?—That is one of the main reasons.

39,434. What others are there?—That is perhaps the only reason, apart from inadequate funds.

39,435. Are the District Local Boards spending less money on the roads than was being spent before by the Public Works Department on their

behalf?—I do not think they are spending less, but the expense of upkeep has enormously increased.

39,436. Why?—Owing to the general rise in prices. The cost of metalling a mile of road now is very much greater than it was seven years ago.

39,437. In what year was this transfer made?—In 1924, I think.

39,438. Has there been any increase in the cost of the upkeep of roads since the transfer was made?—Not since 1924, but there has been since a few years before that, and the grants for roads had become insufficient even in the time of the Public Works Department.

39,439. We have had it in evidence that the resources of the Provincial Government have increased considerably since the Reforms; the total budgeted revenue of the Provincial Government is much greater now than it was before the Reforms?—I believe it is.

39,440. You cannot give me any figures?—No.

39,441. Would you accept a figure, for the increase, of 5 or 6 crores?—I cannot say; I have never compared the revenues.

39,442. You admit there has been a considerable increase in the total revenue of the Province?—I believe there has been, but I have never dealt with that subject.

39,443. Assuming that is so, is it your opinion that, speaking generally, the District Local Boards have received for road purposes a fair proportion of the increased revenue of the Provincial Government?—I could not say what proportion they receive. It is generally made in the form of special grants.

39,444. Would it come in the Civil Works Budget of the Provincial Government?—I do not know where it would come.

39,445. I have here the Civil Works Budget, which shows that expenditure on civil works was over 80 lakhs in 1924-25 and under 60 lakhs in the current year. That includes a reduction of expenditure on communications from 8 lakhs odd to 3 lakhs, and a reduction in grants-in-aid from 8½ to 6 lakhs. This would seem to suggest that the contributions from the Provincial Government to the District Local Boards and its own expenditure on roads had fallen off considerably in the last two years?—I do not think those figures would include contributions to District Boards.

39,446. What does "grants-in-aid transferred" refer to? It is under the heading of Civil Works. What can it refer to but grants-in-aid for roads?—I cannot say.

39,447. That does distinctly mean roads in other Provinces. At any rate, you do not suggest that the Provincial Government is in any way responsible for the inadequacy of the funds at the disposal of District Local Boards for the upkeep of their roads?—No.

39,448. Nor can you refute a suggestion of that kind?—No.

39,449. *Sir Ganga Ram*: Was the state of the roads any better in the days when there were official chairmen than it is now?—The District Board roads have certainly fallen off since 1924.

39,450. You think that is due not only to inadequate funds but to inefficient staff?—That is so.

39,451. Is there no one to control this staff? Is it not the duty of the Commissioner?—No, he has no authority in the matter at all.

39,452. On page 626, you give the cost of nitrates as Rs.9 per maund in Saharanpur. Are you sure of that figure?—These are figures given to me by the Collector of Saharanpur. I think they are wrong; it does not cost so much as that.

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39,453. Has this tax on property to which you refer remained in abeyance in the Province, or has it been levied anywhere?—The Meerut Board are now starting it.

39,454. Can the proceeds be spent on roads?—Yes, for any purpose. It goes to the general funds of the Board.

39,455. On page 625, you say that many villages are ten miles or more distant from any recognised road. Have you no system of *mandis* where the cultivators can sell their produce?—There is no organised system.

39,456. We have in the Punjab an organised system of that kind?—There is nothing like that here.

39,457. Is there a Board of Communications here?—Yes.

39,458. Is not that part of their duty?—I do not know what their duties are.

39,459. Are there no rules laid down by Government for the guidance of District Boards as to what proportion of their revenues they must spend on roads?—No.

39,460. *Sir Henry Lawrence*: Was this Board of Communications formed recently?—It has been in existence for several years.

39,461. What are their functions?—I do not know.

39,462. They must co-ordinate the road policy of the Province, I suppose?—I imagine they do.

39,463. Do they never communicate with the Commissioner?—Yes, on individual subjects; generally on the question of whether a particular road should be provincialised or not, and things of that kind.

39,464. If a road was falling out of repair, would the Board of Communications have any power to intervene with the District Local Board?—If they have that power, it is not one that is ever exercised, nor is it one of their recognised powers. Government can call on a Board to fulfil its duties in the matter of roads.

39,465. *Mr. Calvert*: Cannot the Commissioner do that also?—He can, but he has been left with so little power that he cannot do very much.

39,466. *Sir Ganga Ram*: On page 625, you say, "The breaking of culverts owing to failure of repairs is becoming serious." Are you referring there to canal or to drainage culverts?—To those which carry the drains across the roads.

39,467. And which were originally made by the Public Works Department?—Yes. In many cases they have broken down, and no one troubles to repair them. That is on unmetalled roads, of course.

39,468. Would you support the proposal that Government should construct tube-wells and give out the water on a co-operative system? I know of one man who constructed a tube-well which was too big for his own needs, and was therefore uneconomic. Would you support the idea of Government constructing a series of tube-wells and giving the water out on the irrigation system?—It sounds an attractive idea, but I have never thought of it before.

39,469. *Sir Thomas Middleton*: Has there been any change in the relationship of officers of other departments (such as Forests, Agriculture, Education) to the Collector within your experience?—I do not think so.

39,470. The introduction of the Reforms has made no difference in that respect?—I do not think it has.

39,471. In former times the Collector was head of everything in the district and was referred to in connection with all district movements. Is it not the case that now an agricultural question may go right past

the Collector to the Director of Agriculture? The Collector may not hear of the agricultural movements in his own district?—There is that tendency.

39,472. You do not notice that markedly?—I cannot recall an instance. I have not been a Collector for the last eight years.

39,473. In your note you mention the deterioration of seed; can you remember any variety to which this criticism was applied?—Wheat.

39,474. Do you remember whether it was one of the Pusa wheats?—I cannot say what it was.

39,475. Deterioration might be due to different causes; it might be due to mixture, probably it was due to mixture?—Yes.

39,476. You advocate demonstrations in villages. Are demonstrations in villages not now numerous in the United Provinces?—I believe they are being introduced now. I do not know since when they have been started. I am told that it is the present policy.

39,477. It is a comparatively modern development?—Yes.

39,478. Similarly, you advocate supply of seed, &c., at reduced rates to people willing to experiment. Is that not now being done?—I am not aware whether it is being done or not. There is no doubt that cultivators like Jats, if they come to realise that a thing is good, will take it up.

39,479. With respect to village roads, you have indicated that the kind of body you had in view was either a village authority or a group of villages, something of the panchayat type?—Yes, something of the panchayat character.

39,480. From what source would that body derive funds?—That I have not thought out.

39,481. Do you think that it would be possible to authorise such bodies to require a certain number of free days' labour in each area for the repair of roads from the cultivators in the village?—That would be re-introducing a system which has been gradually broken, the system of compelling the village serf to work for nothing.

39,482. It is not a village serf; it is the village cultivator. I am now thinking of a country in which many improvements in the countryside were going on a century ago; there it was frequently a condition that each tenant of land should supply a certain amount of labour free, for the improvement of estate roads. The total time given was very small, but the results were that the roads were kept up?—It would want someone to control it.

39,483. There must be authority behind?—Yes.

39,484. Your panchayat or the local authority must derive the authority from legislation or otherwise?—Yes.

39,485. *Sir Ganga Ram*: Is there no Panchayat Act in this Province?—We have got the Panchayat Act; but the panchayats are formed primarily for deciding cases. They can, however, spend any funds which they have on local improvements.

39,486. *Sir Thomas Middleton*: From page 626 of your memorandum I take it that your considered view is that Government supervision is essential for the co-operative movement?—It is absolutely essential.

39,487. But I think in reply to Mr. Calvert I heard you say that it was only temporarily essential. If you get better education the necessity for the close supervision which you require would disappear?—Co-operative societies require supervision, but, strictly speaking, they should supply their own supervision; it should not come from outside.

39,488. My question refers to the outside supervision. Temporarily, it is essential and must be supplied by the Government?—Yes.

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39,489. Have you considered at all what time it will take for the co-operative movement to run itself?—I am afraid I have not.

39,490. Considering the position in the United Provinces, the time might be infinite?—I am afraid so.

39,491. You mention the failure of one cattle-breeding society which was formed in the United Provinces. Can you remember now whether any reasons were given to you for its failure?—I cannot remember.

39,492. *The Chairman*: Do you think that there is a sufficient amount of credit available to the cultivator in the United Provinces to-day?—It is a very difficult question for me to answer off-hand.

39,493. It is also a very difficult one for us to answer. Do you think that the provision of further credit at a lower rate of interest than that at present paid by the cultivator and in the cultivator's present state of knowledge would be of service to the agriculturist?—Not unlimited, because if you dangle money in front of the cultivator he will always take it whether he wants it or whether he does not want it. I mean there are dangers to the cultivator himself in giving cheap credit.

39,494. The measure of his avidity for borrowing is the extent of his credit, the capacity to borrow?—He is very improvident.

39,495. So that we come back to the principal theme of your Committee's Report, namely, that education is the first function of the co-operative movement, and until the cultivator is educated to the better using of money it is very little use placing more credit at his disposal. Will that be a fair statement of your views?—His present credit is undoubtedly very expensive. The rates he pays for his credit are extremely high. I do not think the co-operative rates are very high.

39,496. If you are going to bring down those rates by a substantial amount, would it, in your view, be essential that either a closer scrutiny of the application for credit should be made or else the education of the cultivator should first be undertaken?—Either there should be a closer scrutiny or he should have a better understanding.

39,497. Which would you yourself like to see come first, provision of cheaper credit or an attempt to organise and educate the cultivator through the co-operative credit movement?—I think they should go side by side.

39,498. Assuming that further and cheaper credit were made available through the co-operative movement?—Yes.

39,499. But any attempt to supplement the co-operative credit movement or some other movement, whether conducted by Government or howsoever, which will not in itself be educative, might rather retard than encourage the growth of the true co-operative movement?—You mean the conflict between the *taccari* and other forms of credit?

39,500. Yes. *Taccari* is an instance of the sort of facilities of which I am thinking?—I do not think *taccari* has any retarding effect on the co-operative movement.

39,501. What is the rate of interest on *taccari* in the United Provinces at the moment?—I think it is $7\frac{1}{2}$ per cent.

39,502. Let us assume that the interest for *taccari* loans is reduced to 6 per cent., and that instructions were issued to the effect that *taccari* loans should be made more general and easily available to the cultivator; let us assume that instructions were issued to the effect that the recovery of the principal of the cultivator's loan was to be eased from the cultivator's point of view; what effect do you think that would have on the co-operative movement in the United Provinces, on the credit societies?—I do not think it would have any particularly bad effect at present.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Saturday, the 19th February, 1927.

Saturday, February 19th 1927.

DELHI.

PRESENT:

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

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

Raja Sir RAMPAL SINGH—(*Co-opted Member*).

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

The Honourable LALA SUKHBIR SINHA, the United
Provinces Zamindars Association, Muzaffarnagar.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (i) Every Provincial Government ought to have one or two experimenting stations like Pusa and Muktesar where research on scientific lines may be carried on, both into the modern theory in order to find out how far it can be economically and conveniently adapted to Indian conditions and also into the indigenous theory for ascertaining what improvements can be effected therein and for finding out the economic value of traditional methods of agriculture. Just as the success of a central department depends upon the support given to it by similar departments, so it is an established fact that the utility and success of provincial departments is vouchsafed by a strong and efficient central head through which the provincial activities may be co-ordinated and may be saved from dissipation, because, though every Provincial Government has problems peculiar to its own conditions, yet there will be a lot of overlapping if there is not a suitable central agency to guide them. The institutions maintained may confine attention to broad matters which affect several Provinces together and may carry on the work of specialisation.

In course of time when the finances improve and more public support is forthcoming, the Association shall recommend that experiments may also be carried on in district agricultural schools and farms, as there are several agricultural practices and insect pests which are peculiar to a certain area. The Central Provincial Research Institute will specialise and guide the activities of district institutions.

(ii) Veterinary Research has so far received very scant attention and animal diseases are becoming so varied and numerous that the veterinary surgeons do not even understand their nature and names and so find themselves unable to diagnose them. Thousands of animals fall victims to such diseases and this hits hard on the poor cultivator who is forced to borrow money. Every Province should provide at least one big veterinary research station where research into indigenous herbs and drugs may also be carried on side by side with research into animal diseases, as there are several indigenous herbs which are very potent in curing animal diseases and which may be very cheap, being obtainable in large

quantities and so within means of the poor cultivators. The Association is also of opinion that classes may also be held at such research stations for turning out qualified veterinary surgeons who may be educated and trained more in the Indian system of treating animals than in the Western system. These institutions should also be managed under the Agricultural Department.

As for finances, the Association is of opinion that a larger percentage of the general revenue should be utilised for the improvement of agriculture as land tax provides an increase of about 50 crores, out of which only 82 lakhs is spent on agriculture by the Provinces and the Central Government and thus the proportion of expenditure on agriculture is less than 2 per cent. The Provincial Governments should not grudge this as, during the last two years, they have been having surpluses and provincial contributions have been considerably reduced and might be remitted in the near future. The District Boards should also co-operate more with the Government in meeting expenses on agriculture. If there be further need, a small export duty may be levied on exports of raw materials and the import duties may also be increased on sugar, cotton goods and silk, etc.

(c) (1) Entomological and pathological research in connection with plant diseases and pests should be thoroughly studied and research made into the practical methods of eradication; for example, red-rot, sugarcane fungus diseases (rice hopper, white ants, etc.).

(2) There is lack of activity in the direction of arboriculture, plant breeding and the fruit industry. A variety of fruits and timber can be grown in several districts and will provide spare-time employment for agriculturists if there is proper direction with regard to the soil and climatic conditions of each place, and as to the varieties of fruits and timber which it may be commercially profitable to produce.

(3) Lac and silk.—There are a lot of trees in several districts which can breed these worms. So attention should be directed to these.

(4) Research into the theory of dry cultivation.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) and (ii) The supply of institutions and teachers is neither sufficient nor efficient. So far as the Association knows, in all agriculturally advanced countries, e.g., in America, every State maintains an agricultural college and research institute with a farm, besides the institutions maintained exclusively by the Central Government. But in India, the United Provinces of Agra and Oudh, for instance, possess only one agricultural college at Cawnpore and one district school at Bulandshahr, which are insufficient to meet the requirements of a Province with more than four crores of population. The Association is of opinion that at least one agricultural school should be established in every district. If the Government, for want of finances or any other cause, is unable to start separate agricultural schools and colleges, I am prepared to go to the extent that the Government schools and colleges imparting liberal education should be reserved for imparting agricultural and industrial education, as private enterprise has already begun to play an important part in the sphere of liberal education and as there is a sufficient number of aided schools and colleges.

(iii) The teachers in rural areas may be drawn from the agricultural classes as this may serve as an incentive for education among the agricultural classes and as they will be more useful, having first-hand knowledge of rural conditions.

(iv) The attendance, considering the small number of agricultural institutions and the distance that separates them from people of several areas, and the theoretical nature of education imparted in them, may be considered reasonable. But I think if agricultural institutions are established in other important centres and education made more practical and the course is not lengthy, the number of students will greatly increase.

(v) As interest in agriculture is not thoroughly developed and as few people think of cultivating on modern lines and as facilities for acquiring land and capital do not sufficiently exist, the main incentive in attracting lads to study agriculture is the hope of getting employment in Government service or elsewhere.

(vi) No, they are drawn from all classes and are not confined to the agricultural classes alone.

(vii) The courses of study require modification, and they should be altered to fit in more closely with Indian practice than with Western theory; education should be imparted through the medium of the vernacular.

(viii) All the items (a), (b), and (c) are very necessary according to the standard of education, i.e., in the lower primary schools, nature study should be made compulsory and, in upper primary schools, there should be school plots, while in the town and high schools there should be farms. By so establishing plots and farms, students will be attracted in a large number to these institutions, where several practical things will be taught which may be of general use in every day cultivation. The cultivators will also begin to have more confidence in the possibility of educating their children.

(ix) The majority of students find no work to do. They first hanker after Government service and when they fail they sit idle at home, as very few have sufficient facilities to start private farms.

(x) After agricultural education has been given to them, they should be given facilities for getting consolidated holdings, obtaining capital on low rates of interest and on long terms of credit and, if the holding is situated in a locality where water facilities are not available, wells should also be erected and a reasonable water rate should be charged. Marketing facilities and means of communication should also be improved. Facilities should also be given to lads in getting appointments in the Agricultural Department, Court of Wards, Irrigation Department and Districts Boards. All possible help and facilities should be given to students in securing sufficient land for their own cultivation and opening farms on modern lines. A grant-in-aid should be given to deserving candidates who start their farms on modern lines. All this can be done by the co-operation of Government officers, the landlords and the bankers.

(xi) No, there should be facilities for the provision of agricultural literature in the public libraries and to the teachers of the rural area schools. Students who have studied agriculture should be invited by the Superintendents of agricultural farms to a yearly or biennial conference where they may be able to discuss questions that affect them, in the light of the most up-to-date research and may also be able to study the different field operations.

(xii) Lectures should be given with the help of magic lanterns and cinemas and practical demonstration on agricultural farms. Agricultural exhibitions should be arranged and prizes and rewards be given to competitors in almost every district. Scholarships should also be given at the outset to deserving and needy students.

(xiii) (a) In every school, where there is a school plot or school farm, there should be trained men to supervise the work and teach the students under the direct control of the village panchayats or a body appointed by the District Boards. This work should further be supervised by an Inspector of the Agricultural Department.

(b) Finances we have already discussed in our reply to Question No. 1. We suggest, further, that the import duties on sugar, silk and similar other agricultural articles be used for the improvement of these industries in particular and agriculture in general as they are levied not so much for the sake of revenue as for the protection of these industries.

The Honourable Lala Sukhbir Sinha.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) The following measures have been found successful and may profitably be adopted in India for propaganda:—

- (1) Demonstration farms.
- (2) Experiments with seeds and implements on the plots of cultivators.
- (3) Lectures on improved seeds and implements.
- (4) Circulation of agricultural pamphlets and publication of agricultural magazines.
- (5) Agricultural exhibitions.
- (6) Agricultural Associations, Zamindars and Tenants Associations and Conferences.
- (7) Societies for the supply of seeds and implements.
- (8) Cinema films and magic lantern lectures.
- (9) Periodical touring of professors with groups of students who may mix with village people and lecture to them on agriculture.
- (10) Broad-casting.
- (11) News bulletins should be posted at village post offices.
- (12) Propaganda amongst railway passengers, who are mainly drawn from agricultural classes.
- (13) New seeds and implements should be demonstrated and exposed to public view on market days, *melas* and fairs where cultivators from surrounding tracts gather.

(b) In different localities by turns, big tenants should be induced, even by financial help if necessary, to set apart a certain parcel of land for experimental purposes to test methods especially adapted to their particular locality. The Government should send experts there to analyse the soil, discover just what chemical constituents are lacking in it and what fertilisers are necessary to bring it up to productive perfection and for what particular crops it is best suited. It is an everyday experience that cultivators, conservative and poor as they are, do not feel inclined to adopt methods and seeds unless they see their success on their own land. Such experiments will create confidence in the minds of the cultivators of the locality.

Besides the above method we also recommend that, at demonstration farms, conferences should be held to which cultivators of different tracts may, by turn, be invited. At such meetings lectures should be delivered and practical demonstrations and exhibitions of private products held.

(c) Yes, besides the methods described in (a) and (b) above which in themselves induce the cultivators to seek expert advice, cultivators may be encouraged through the members of the different agricultural and other associations to attend the associations' meetings, where agricultural experts should be present to advise them. Also cultivators may be encouraged to adopt the practice of securing expert advice, by sending questions to Government experts, to which the experts should promptly and fully reply and, if need be, go themselves to the locality to explain. Furthermore much depends on the confidence which the Government officers are able to create in the cultivators' mind by mixing and sympathising with them.

QUESTION 4.—ADMINISTRATION.—(a) Since the Reforms and the appointment of Ministers, the local Governments are, no doubt, spending more money now than before on agriculture and more attention is given to it, but, in our opinion, the Government of India should also maintain a separate Department of Agriculture of its own and thus save dissipation and overlapping and waste of energy by co-ordinating and supplementing the activities of the Provincial Governments and by taking charge of subjects of All-Indian importance, so far as they have a bearing on agriculture, such as Posts and Telegraphs, Railways and Roads, the Meteorological Department, Finance, and also research into crops of national importance like cotton, wheat, sugar cane and tobacco. The Government of India, in our

opinion, should appoint an All-India Board of Agriculture. The success of the Indian Central Cotton Committee has shown that such an institution is indispensable for the success of other important crops like wheat, sugar cane and tobacco and agriculture as a whole. Such a Board shall arrange for thorough research into these crops on the general lines followed by the Central Cotton Committee, hold conferences in the Provinces and advise the Government of India on all matters affecting Indian agriculture.

(b) There is no need of pooling the services of experts under the Government of India, but the Central Government should as at present, maintain its own research institute, which should specialise in particular subjects and leave the rest to the Provinces.

(c) (i) The Agricultural and Veterinary Services are top-heavy. The high officers pay only flying visits and seldom come in contact with the cultivators and hence are unable to give much practical help to the agricultural classes. There is need of a large number of subordinate officers in districts, who may tour and mix freely among the cultivated classes and try to create confidence in the villagers' minds.

(ii) Railways and steamers are doing great services to the agriculturists but their activities require expansion in several directions. There ought to be more feeder railway lines which may extend into the interior and thus improve village communications. Freights on manure and implements and agricultural products should be reduced and third-class railway fares should be lowered, in order to encourage travelling amongst the cultivators and thus broaden their outlook by mutual intercourse and visits to exhibitions, etc. Coastal steam navigation should further be developed. Traffic by means of steamboats should be increased on large rivers and canals like the Ganges, the Indus, the Brahmaputra, the Ganges Canal, and so on, as it will afford a cheap and efficient means of communication with the interior and thus render unbounded services to agriculture.

(iii) Roads are in a very deplorable condition in the *mofusal*. There are districts in which even tashils are not connected with the headquarters by metalled roads. There are hardly any village *pucca* roads and whatever *katcha* roads or village tracts there are, they are in a very bad state. We have seen instances where, during the rainy season, villages become unapproachable for months together. This lack of roads obliges the cultivator to sell his produce locally as he cannot take it to the market place where he may be able to sell at a greater advantage. Lack of means of communication prevents the development of markets in the rural tracts and make it difficult for the agriculturists to get prompt medical and veterinary aid and expert advice on crops and implements, etc. Roads should be metalled as far as possible and *katcha* roads should be kept in better condition. The District Boards and the Public Works Department should co-operate more thoroughly and should be more active in this direction.

We brought this matter to the notice of the United Provinces Government by means of resolutions in the months of September and December, 1910, but nothing was done.

(iv) The meteorological observations and forecasts should be translated into the vernaculars of the Province and distributed free in villages, at least the *patwaris* and the school teachers should get copies, and they may be directed to send and explain them to the cultivators so that they may be able to guard themselves against impending calamities of drought, hail or storm.

(v) and (vi) The aim should be to provide every village with a post office and every *kasba* with a telegraph or telephone office, so that information of prevailing market rates, and latest agricultural improvements and discoveries may reach the rural centres at the earliest opportunity. The development of post, telegraph and telephone will greatly increase the selling power of the cultivators.

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QUESTION 5.—FINANCE.—(a) (1) Expansion of the Co-operative Department by opening more co-operative banks, credit societies, sale and purchase societies, implement societies, irrigation societies, and so on, which should be able to finance agricultural operations and provide credit to the cultivators.

(2) Establishment of land mortgage banks which should provide long-term credit on easy terms. The Government should also give aid in the form of loans to such banks on low rates of interest. Such banks, besides enabling the cultivators to wipe off their debts will increase their reserve power. They will sell their crops at the proper time. The Imperial Bank with so much Government money at its disposal without interest should co-operate with and help these banks to a greater extent.

(3) Recurring and non-recurring grants should be given by the Government to students of agricultural colleges and schools who start farms on modern lines and control should be kept over such farms in the same way as in aided schools and colleges.

(4) The Government should appoint a small Board of, say, three or four members, presided over by the Director of Agriculture which may advise the Government in the granting of loans and grants-in-aid. The Board should be run on the same lines as the Board of Loan Commissioners in the Industries Department of the United Provinces Government.

(b) *Taccavi* should not be distributed through the Revenue Department, except in famine tracts and other special areas, as the cultivators use most of it in unproductive purposes and some of it is misappropriated before it reaches the applicant. The *taccavi* should be given through the co-operative societies so that the cultivators may not use it for unproductive purposes and may be able to repay it.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) Natural calamities, such as failure of the monsoon, irregular rainfall, hail-storms, frost, outbreak of cattle diseases, purchase of occupancy rights, and unnecessary litigation; bad social customs and rules requiring the cultivator to incur a lot of unproductive expenditure on marriages, death ceremonies, house building, feasts, etc.

(ii) The chief source of credit to the cultivator is the village *shroff* who is always ready to give credit to the cultivator at a high rate without caring to what use the cultivator puts the borrowed money.

The co-operative credit societies are still in their infancy but they are doing very useful work in this direction.

(iii) The low margin between the cost of production and the sale price. The usurious rate of interest which often rises very high, lavish expenditure over unproductive purposes.

(b) and (c) (1) Spread of education in order to broaden his outlook, create a sense of self respect and raise the standard of living.

(2) The spread of co-operative societies.

(3) Land mortgage banks, which should enable the cultivator to wipe off his debts at easy rates of interest on long-term credit.

(4) Measures should be taken to restrict the credit of cultivators. Non-terminable mortgages render the cultivator landless and should therefore be prohibited. In the United Provinces of Agra and Oudh, the Agra Tenancy Act III of 1926 has somewhat restricted the cultivator's power to mortgage his cultivating rights under Section 27, and it might produce wholesome effects.

(5) The Government should help cultivators financially in the reclamation, protection or improvement of land, recovering it in the form of enhanced assessment.

(6) The development of side industries such as cattle breeding, spinning and weaving, horse breeding and poultry raising, thus reducing pressure of population on land.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—The Association is strongly in favour of consolidation of holdings, but this cannot be done without overhauling the present Land Revenue and Tenancy Acts. In Japan and other countries, consolidation of holdings and prohibition of sub-division of holdings has proved very useful. The United Provinces Government, on the suggestion of Mr. W. H. Moreland, Director of Agriculture, invited public opinion on this subject, but we do not know why this matter was dropped; perhaps it was because the difficulties on account of land legislation were found unsurmountable.

Sub-division is often the outcome of inheritance and succession. Several big states are being divided into the several claimants converting them into petty landlords. We are strongly of opinion that some sort of legislation should be devised by means of which partition of states may be prohibited, the profits being only divisible. This will prevent sub-division.

As regards fragmentation of holdings, we think a minimum limit might be fixed by legislation beyond which fragmentation will not be allowed and the Settlement Officer should be given some powers to consolidate holdings at the times of settlement as that is the best time for settling such matters.

Consolidation of holdings may also be attempted through co-operative societies as is being done in the Punjab and also through village panchayats, by convincing the landlords and the cultivators of the importance and utility of consolidation.

QUESTION 8.—IRRIGATION.—(a) (i) In the United Provinces, there is hardly any big river left from which any canal can be cut, but there are many small rivers that can be dammed for irrigation purposes.

(ii) Yes, tanks and ponds should be made wherever possible and should be filled with rain water that is now wasted in large quantities.

(iii) Yes, there is great scope for extension of irrigation from wells; where there already is irrigation from wells or it can be had, no canal water should be allowed there. When the Deoband branch on the Ganges canal was opened, it was made a condition that no canal water would be supplied to those lands that were irrigated from wells, but this condition was gradually overlooked, on account of which hundreds of wells have gone out of use. I moved resolutions on the question of well irrigation and preservation and storage of rain water in the United Provinces Legislative Council in 1916, from the debates of which my proposals can be seen. The Association would suggest the creation of a Tanks and Wells Department of Irrigation, similar to that existing for canals, so that this sort of irrigation may be extended either by Government or by landlords or by co-operative societies, and water rates for such irrigation may be collected through the Revenue Department like the canal water rates. In our opinion, this arrangement will prove very useful and profitable, and details may be worked out.

(b) The existing methods of distributing canal water to cultivators is not satisfactory as water is not supplied at the time when it is required and the quantity is not sufficient. The dimensions of the outlets have been reduced from time to time and the beds of channels have been lowered so that enough water may not pass through them. This has been done not so much to stop the wastage of water as to save water to irrigate new lands. This is evident from the fact that the supply of water in canals is the same in quantity, while new lands have been irrigated from the same supply. My father, the late Honourable Rai Nihalchand Bahadur compiled and published a pamphlet on this subject, from which it will appear that 1,130 miles of new channels were opened during five years (1900-04) and these were fed from the old channels to irrigate new lands. The figures after this period, which I could not obtain, will, I believe, show a further extension of new channels. There is no doubt that there was some wastage of water that was necessary to be checked by diminishing the diameter of outlets and by deepening the beds of channels and by the new system of

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tatil, but the crops have suffered a good deal, especially the sugarcane crop, for which sufficient water is not supplied. In the United Provinces a joint sub-committee consisting of two members of the Board of Irrigation and three members of the Board of Agriculture was appointed in the year 1921 to make enquiry and report as to how sufficient water could be supplied to sugarcane, but to no effect. The Association would strongly urge that the present canal water should not be supplied to new lands until and unless it is proved that water can be spared for them without prejudicing the supply to old lands.

The Association is aware that the irrigation charges are not within the terms of reference of the Commission, but every Famine Commission has dealt with the question, and, therefore, without saying a word about the rates, the Association would strongly recommend that no profit should be made from irrigation charges for general expenses by the Government, as irrigation conduces towards the indirect revenue of the Government by promoting (1) prevention of famines, (2) general improvements in the financial condition of the people by having more produce from land, (3) stability of land revenue and full collections, without any remission, and (4) increase of land revenue in every revision of settlement.

QUESTION 9.—SOILS.—(a) (i) Yes, water-logged soils, especially by the side of railways and canals, should be improved by means of drainage.

(ii) Alkali (*usar*) and uncultivable land may be improved by drainage and by plantation of certain trees which may be specially suited for such land, such as *babul*, *dhak* and *chhonkra* (*jand*).

(iii) Prevention of erosion of the surface soil by flood water or rain water may be done by making embankments at suitable places.

(c) Such lands should be acquired by Government from the proprietors or the proprietors should be induced to make *chaks* of such land, say, of about 100 acres, and these should either be auctioned to those who want to cultivate themselves or should be given to qualified students from agricultural colleges and schools on moderate terms, so that for the first four or five years they may not have to pay anything as rent, and when they get some profit, a nominal rent, say, about Re.1 per acre may be fixed. Then, each year, the rent per acre may be increased by about 2 annas, and thus, after 25 years, a rent of about Rs.3-8-0 per acre may be permanently fixed and right of occupancy given to them. Besides, the Government should give pecuniary help to such enterprises for the erection of buildings, purchase of cattle, implements, and seeds, &c., which should be realised from them by easy instalments. If such places are unhealthy, drainage should be improved and wells erected.

QUESTION 10.—FERTILISERS.—(a) Natural manures are more profitable as they cost less and contain nearly all the ingredients required for the healthy growth of the plant, while artificial manures cost much and have only one or two ingredients, and if applied in excess (as is expected to be done by the ignorant cultivators) may do much harm instead of good; even if applied in moderate quantity by an expert continuously for several years, a time will come when it will not give any result, as the soil will be lacking for want of other ingredients required for the healthy growth of the plants. But to make up the deficiency of the natural manure, which is so common in many places, artificial manures can also be profitably used. Propaganda is needed for the use of manure spreaders, scientific methods of storage, the better utilisation of liquid manure and the growing of leguminous crops.

(b) The artificial manure should first be analysed by the Agricultural Chemist and a certificate given to the owner of the fertiliser to the effect that such and such fertilisers contain so much percentage of nitrogen, phosphate, sulphur and sodium, &c.; after getting the certificate, the owner should fill up bags and have them securely packed and sealed, say, about

one maund in each bag, and sell it to cultivators through agencies or other merchants, declaring that it contains such and such a percentage of such and such a thing. If officers of the Agricultural Department suspect adulteration, they should get a sample from the shop of any such merchant and get it analysed. If the ingredients are contrary to the declaration, Government should take steps under the prescribed law.

(c) The improved artificial manures can be popularised either through the propagandists of the Agricultural Department, canal officers, officers of co-operative societies and zamindars' associations, or by the propagandists of the firms, as in the case of Messrs. Shaw, Wallace & Co., Calcutta. The best propaganda is to apply such manure once or twice, free of charge, on some fields of the cultivators and thus give them practical proof of its utility.

(d) Muzaffarnagar, Saharanpur, Dehra Dun, Meerut and Bulandshahr.

(e) Investigation into the possibility of manufacturing bone dust on a large scale should be made.

(f) (1) The practice of using cowdung as fuel could be discouraged by explaining to cultivators the loss they sustain by using cowdung as fuel instead of manure, and convincing them of the advantage they will achieve by methodical storing and application as manure. To replace cowdung as fuel, the Government should encourage afforestation among the landed proprietors and by the Forest Department, which will give them the fuel required and will also serve the purpose of grazing grounds.

(2) The railway authorities should decrease their railway freight on fuel wood carried to a distance of over 100 miles from forests, and Government should supply fuel on cheap rates from their forests.

(3) The District Boards and canal authorities should be asked to sell the roadside trees and their loppings to cultivators at cheap rates. These loppings will serve two purposes, one as fuel and the second will remove the shade from trees falling on the adjoining lands, and thus make more productive lands which are now becoming useless and unproductive.

(4) The Association would also suggest the introduction of a better, but cheap, system of storage of manure in villages. At present, there is no such arrangement, and the fertilising power of the manure is wasted and decayed.

QUESTION 11.—CROPS.—(a) (i) There is a great scope for improvement in the existing crops; they could be improved by selection of seeds and crossing, by tillage with improved ploughs and other implements, and by a sufficient supply of water and manure. At present, cultivators give their whole attention to the growing of sugarcane and wheat on old lines in these districts, as they are considered to be the chief crops and the most profitable, but they generally use the ordinary seeds and do not try the improved ones, e.g., Pusa 12 wheat, and some other varieties of sugarcane, such as Cuba, which have been introduced by the Agricultural Department, but to a very small extent. I think the supply of improved seeds from the Government demonstration farms at a cheap rate will give an impetus to the poor and conservative class of tenants, as they are very much afraid of any loss in making experiments.

(iii) Improved seeds, which have been found to be useful by experiment, should be largely introduced; this can be done by issuing good and pure seeds from Government farms to seed-supply societies and private farms in the districts, and such farms are expected to increase in number. These private farms should store all their produce for seed and distribute to the public at market rates. To keep up the purity, the private farms should purchase their seeds from Government farms each year, where special care for producing pure seed is taken. The private farms should also be inspected by the officers of the Agricultural Department. If such farmers are not in a position to store their seeds on account of financial

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stingency, their seeds should either be purchased by the co-operative seed-supplying societies, or the co-operative societies should give them the money required to help them, taking their seed as security. On these private farms and at other suitable places, seed godowns should be erected by the farmers and zamindars with Government aid.

(iv) (a) Where such preventions are needed, licences to cultivators for killing or frightening off wild animals should be issued, free of charge.

(b) Government should give grants for fencing on easy terms.

QUESTION 12.—CULTIVATION.—(1) The existing system of tillage is defective, as the tillage is not deep enough for want of good bullocks in sufficient numbers. The great question of preserving cattle, specially cows, that are killed for food in their prime before they produce even one calf, should be tackled by the Commission.

(2) I think the cultivators are fully aware of the necessity for the rotation of crops. I may quote here Dr. J. A. Voelcker's opinion on this subject, expressed on page 11 of chapter ii of his *Report* (Second Edition, 1897) on *Improvement of Indian Agriculture*. He says: "Nor need our British farmers be surprised at what I say, for it must be remembered that the natives of India were cultivators of wheat centuries before we in England were. It is wonderful, too, how much is known of rotation, the system of 'mixed crop' and of fallowing. Certain it is that I, at least, have never seen a more perfect picture of careful cultivation, combined with hard labour, perseverance, and fertility of resource, than I have seen at many of the halting places in my tour."

QUESTION 14.—IMPLEMENTS.—(a) Yes, there is much scope for the improvement of the existing, and the introduction of new, agricultural implements and machinery.

(b) For them more money is required, and ways and means should be devised to provide the cultivators with agricultural implements at a cheap rate. I would suggest that the hire system may be encouraged by private firms and Government agencies. Up to this time very few implements have been found useful; for instance, I have tried several kinds of ploughs, but they have all failed for want of good, strong bullocks and expert labour. Water lifts are badly wanted. Sugarcane mills, driven by bullocks as well as by power, are required. I took one sugarcane crushing machine from the Agricultural Department, but it did not work properly and I had to return it. Similarly sugar-refining machines are required. I had once a centrifugal machine from the Agricultural Department, but it also failed. This shows that up to this time very few new agricultural implements have been found useful.

(c) Many of the agricultural implements are patented, and few firms have the right to manufacture them. If some Indian firm tries to take a new invention and brings it to the notice of the Agricultural Department, their efforts are not generally appreciated and encouraged or patronised, with the result that the enterprisers become disheartened and never make any further effort. To overcome these difficulties, the patent implements which are in general use should not remain patent, so that every firm may manufacture them and give them at cheaper rates in competition. Circulars and orders should be issued by Government that every year there will be competitions for new inventions by Indian firms, and those found successful should be patronised and rewarded, and demonstrated on modern farms in order to create a demand. Firms manufacturing implements in India should receive bounties from the Government in order to meet foreign competition and to enable them to produce on a large scale, and the railway companies should prescribe cheap freights for agricultural implements of Indian make.

QUESTION 15.—VETERINARY.—(a) Yes, I think the Civil Veterinary Department should be placed under the supervision of the Director of Agriculture as agriculture is closely allied to veterinary, so that cattle may be properly looked after.

(b) (i) Yes, they are working well.

(ii) No, the District Boards do not devote sufficient money and attention.

(iii) No; the District Boards themselves should be required to devote more money and attention. The District Boards can do this work more efficiently and effectively, being able to understand the people and their conditions more thoroughly.

(c) (i) The agriculturist does not make full use of such dispensaries, as Indian medicines are not freely used and as the foreign medicines are very expensive. The cultivators are afraid of using foreign medicines for their cattle, as they do not know of their efficacy or advantages. In my opinion, simpler indigenous methods should be adopted so that people may have confidence and utilise them.

(ii) No, as the dispensaries are very few in number. The stay of such dispensaries is very short at one place and the cultivators hardly come in contact with them. They are in a hurry to complete their tours and they do not pay sufficient attention and they advise methods of treatment beyond the reach of common cultivators.

(e) I have been to the Muktesar Institute and I think no extension is required and the produce of serum is sufficient for Indian needs, provided that the export of serum to other countries is stopped. I brought this matter to the notice of the Council of State on the 14th February, 1921. The reference will be found in the Council proceedings, from which it will appear that out of a total of 29,49,000 doses issued, 25,000 were sent to Ceylon, the Malaya State, the Straits Settlements and Egypt, while 90,000 doses were sent for army requirements to Mesopotamia, Persia and China.

(g) It is one of the crying needs of the cultivators as thousands of cattle die of unknown diseases, which loss tells very heavily on them. I think, therefore, that further facilities for research into animal disease should be provided.

(i) and (ii) Whatever extensions are considered necessary may be made in the Muktesar Institute, but I am strongly of opinion that every Province should have a veterinary research institution of its own and should maintain it on a good standard. The Muktesar Institute produces sufficient serum and therefore it should not be necessary for provincial institutions to undertake this work.

(h) (i) and (ii) As regards special investigations, there ought to be co-ordination of effort between the officers of the Muktesar Institute and the provincial officers but such investigation ought, in my opinion, to be confined to officers of the Muktesar Institute.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) Yes, it is one of the most important factors for the improvement of agriculture and milk supply in this country. At present, there is no law for the preservation of cattle, while common game animals and birds are preserved by legislation. Prime cows and young calves are killed every day for food without any discrimination.

In the Military Department alone, lakhs of cows in their prime of life are killed. It is said that on religious grounds Mahomedans cannot be stopped from killing cows, but it is not the case, as it is only once in the year that they sacrifice cows on religious grounds, and then only in a very small number. Leaving this religious sacrifice question untouched, cows and calves that are killed in millions every year for food should be preserved to a certain age, say nine years. With such a drain, how can cattle be improved in breed and number? If some legislation like that passed by the Central Provinces Government that "no cows should be killed for food before nine years of age," is passed, much improvement in cattle is bound

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to follow. At present bulls for covering cows, in villages, are not of good quality. The United Provinces Government is running two bull-rearing studs, one at Madhurikund and the other at Kherigarh. They supply bulls to local bodies and zamindars but the number is not sufficient and the price and terms are unsatisfactory. The number of such studs, where experiments in cross breeding may be carried on and a sufficient supply of bulls and cows assured, must be multiplied. Among the Hindus, the system of dedication of bulls and cows is not so useful now as it was before. A Bill on this subject was framed and introduced in the Legislative Council in these Provinces in 1916 or 1917, but was withdrawn without any discussion thereon.

(ii) and (iii) Young and milch cattle should be saved under legislation from slaughter. Importing of milk or milk products from other countries should be checked by legislation. Model dairy farms should be started and agriculturists should be induced to resort to this industry as a spare-time work. Cattle shows should be arranged on the occasion of big fairs and prizes awarded on a large scale to owners of good cattle. Propaganda should be carried on amongst the cultivators to improve the feeding of cattle, to provide better stables and to encourage better attention generally.

(b) (i) Common pastures are not available in villages for grazing cattle, as there is great competition for cultivable and culturable land. On account of the periodical increase in land revenue, the landlords have to bring every possible yard under cultivation and increase their rates. This question has been brought by me to the notice of the Government on several occasions, but no action has been taken. The Cattle Breeding Committee, of which I am also a member, made some recommendations to the Government but nothing has yet been done. In my opinion, a certain percentage should be fixed for every village, or circle of villages, for the preservation of land for grazing purposes.

(iii) Sufficient area for fodder purposes is not kept as the cultivators like to grow more profitable crops than fodder. Unfavourable seasons caused by late rains, early stoppage of monsoon, excessive rains, are also causes of shortage of fodder. The cultivators, being in need of money, sell dry fodder in the bazaar and starve their own livestock. The poor cultivator cannot help doing it as his reserve power is very limited.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) The cultivators are busy on their holdings during the year but they can do much industrial work in the slack season if they are made to take an interest in it and if they are made to understand the advantages of carrying on part-time industries. At present, the chief cultivators are always busy on their holdings while the labourers, when they get no work in the field, do some petty works which they know by their profession, such as basket and rope making and weaving.

(b) to (h) It is a very big question to solve as it involves the vexed question of import and export duties, on which the prices so much depend. All the industries, as mentioned in sub-clause (c), can be developed and the great industry of weaving has a great field. But all these village industries are dying out and are almost dead on account of competition with imported articles that are very cheap and with which hand-made articles cannot compete. In these days of competition such industries should be organised by Government help into joint stock companies, so that the workers may get enough money and a market for their manufactured articles. Industrial work, as is done at present, cannot pay the workers as much as they can get through joint stock companies.

I am certainly of opinion that Government should do more to establish industries as mentioned in sub-clause (d), but here also the question of money and co-operation comes in. In industrial countries like Germany and America in the West, and Japan in the East, agriculture and industries have made much progress, with State help and the co-operation of the

people. Here, up to this time, very little State help has been given to them. I may give only one example, that of sugar making. The Government of India appointed the Indian Sugar Committee in October, 1919, under their resolution No. 949/151, dated the 2nd October, 1919 (Revenue and Agricultural Department) that: "While, therefore, India, should be in a position, as she was in the past, to produce a surplus of sugar for export, she has in fact had to supplement her own supplies by imports the tendency of which steadily to increase has only been checked by war conditions." From this it is clear that the scope of development here is so great that this country can produce sugar enough not only for its own requirements but also a surplus. It is a question what the Government of India did on the Report of that Committee. There are many such industries where nothing has been done. This country has all natural facilities and was once the chief industrial country in the world, but on account of the frequent changes of Government and lack of education and means of communication, it has lagged behind other countries that are now richer than India. It is evident from the fact that almost all raw materials, like cotton, jute, hessian and leather, and even drugs and medicines, are exported in their raw condition and imported after being manufactured at as much as twenty times the price. What more, or better, suggestions and proposals can be made than those made by the Royal Industrial Commission in their Report of 1916-18.

QUESTION 19.—FORESTS.—(a) The forest lands are not at present put to their fullest use for agricultural purposes. Grazing facilities granted to villagers are not sufficient. The number of cattle fixed in each village is insufficient. On this subject some resolutions have been moved by me and other members, and discussed in the United Provinces Legislative Council in which many points were raised. The present Forest Rules require a good deal of change to give full advantage, in forest lands, to the villagers for providing grazing facilities for their cattle, and grass on reasonable cheap rates.

(b) Yes, the supply of fuel and fodder from forests in rural areas may be increased by making the Forest Rules easier than they are at present. Arrangements for producing fodder crops instead of grass, in such areas where possible, should be made and the forest tax on fuel carts charged at the forest *chaukis* should be reduced. The railway authorities should give concessions for transporting fodder and fuel from such areas to the consumers.

(c) Yes, there is a great opening for schemes of afforestation, in villages, by landowners and the Government. If expert advice is made available to them and some system of supervision is provided to look after such private forests, I am sure many landlords will come forward to plant trees on their lands. For this purpose I would suggest that, as an experiment in a Division, for instance in Meerut Division, a staff of experts be appointed to help and advise the landlords in this respect on reasonable terms. I would like to be the first man to undertake this work as a demonstration for others.

QUESTION 20.—MARKETING.—Trade journals in English and vernaculars should be published for the information of the cultivators and merchants. At present, information on market conditions is not available in towns and urban areas, on account of which the whole trade depends upon local conditions and the cultivators are often cheated and made to sell at low prices.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—The customs duties, both import and export, as well as sea freights have a great effect on the cultivators as they get prices for their produce according to their incidence. These duties should be levied or remitted according to the interests of

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India and not of any foreign country. The development of agriculture and industry in this country, as well as in other countries, entirely depends upon these industries. In India, this question requires very serious consideration, for instance sugar, cotton, and similar other products cannot compete with other countries without State help and the regulation of customs duties for export and import.

QUESTION 22.—CO-OPERATION.—(a) (i) Much stress should be laid on training in co-operation in the Agricultural College, Cawnpore, from which recruits for the Co-operative Department should be selected by Government. Facilities for giving more money to co-operative societies should be provided by Government, on easy terms. There should be more staff from the side of Government to supervise the work so that the societies may have credit and the public may have sufficient faith in them to freely deposit money in such societies.

(ii) The members of the non-official agencies should bring to the notice of the public the advantages of the co-operative movement and the benefits achieved through co-operation in other countries, so that the public may be attracted to take part in this movement, purchase shares and become members. These members should devote time to supervising the work on an honorary basis, so that the societies may have better profits. Co-operation is necessarily the peoples' movement and unless non-official support and activities are forthcoming, Government single-handed cannot do much. All associations and societies which have the interest of agriculturists at heart, should co-operate in making the movement a success for, through this movement, the cultivator can be saved from the manifold miseries into which he falls owing to ignorance.

(b) (iv) I have been of opinion for a long time that the zamindars or the co-operative societies should be given power by legislation to collect water rates for irrigation, by means of power pumps, from the wells or tanks which they construct. At present, there are no facilities for them to collect such charges and therefore they are not inclined to invest money. Under sub-clause (ii) (a) of Section 3 of the United Provinces Tenancy Act III of 1926, the words " the construction of tanks, wells, water channels, and other works for the storage supply or distribution of water for agricultural purposes " are inserted, but it is not clear from them that, if any zamindar will supply water to cultivators at his own cost, he will be able to collect water charges like the Canal Department. If legislation is enacted to that effect, I am confident, that people will come forward to invest money gladly for this purpose.

QUESTION 23.—GENERAL EDUCATION.—General education in my opinion has the greatest bearing on agriculture as agricultural improvement has been greatly retarded owing to conservatism, lack of foresight and low standard of living, which are all outcome of illiteracy. In all agriculturally advanced countries education preceded improvement in agriculture or industries, as, by means of education, the cultivators begin to realise what is to their loss and what to their benefit, and to take interest in all matters affecting the improvement of their profession. I am of opinion that compulsory primary education should be introduced in the rural areas, and night schools should be started so that cultivators may not feel inconvenience in sending their children to school, and the courses of study should be so drawn up as to enable the pupils to become practical members of the village society and to carry on their profession. The view was expressed by His Excellency Sir Malcolm Hailey, Governor of the Punjab, in his opening the Punjab Educational Conference at Lahore, that the present growth of education did not exert on the minds of the people at large that general stimulus and broadening of mind that they hoped to see. Education would make real progress when the trader believed that it would make his son a more alert

man of business, when the agriculturist was convinced that his son would be a more skilful and energetic cultivator, when in short it was the general belief that education gave a man a better outlook and equipment in every sphere of life.

QUESTION 24.—ATTRACTING CAPITAL.—(a) At present the Assessment Rules and the Tenancy Laws stand very much in the way of capitalists investing money in land or agriculture. It is a well-known fact that if a man is not certain of getting a good return for his investment, he is not likely to spend money. Under the present circumstances both the Land Revenue Assessment Rules and the Tenancy Laws are such that they do not induce the money holders to invest money and therefore in my opinion the Land Revenue Assessment Rules must be brought under legislation and the legislative bodies must have control over the land assessment.

(b) The Land Revenue and Rent Acts, in every Province, are the main factors tending to discourage owners of agricultural lands from carrying out improvements. They require a complete overhauling in principle as well as in detail, so that people may be able to invest more money in them. This is one of the most important questions for the development of agriculture and I hope the Commission will give it their most serious consideration, as without capital no improvements in irrigation, manure, seeds, implements and expert labour can be procured.

QUESTION 25.—WELFARE OF THE RURAL POPULATION.—(a) (i) It is most necessary to improve hygiene in villages. The United Provinces Village Sanitation Act V of 1912, is of some use but it is not properly utilised as it requires many changes. At present there is no arrangement even for sweeping the village lanes. Everywhere you will find pits full of dirty mud and an accumulation of dirty water from wells. There are sweepers in every village, but as there is no system of payment to them they do not do this work, but live upon other kinds of labour.

(ii) Arrangements for fresh drinking water and milk supply.

(iii) Provision of prompt and efficient medical aid.

(iv) Provision of play grounds where village boys may play.

(v) Defence licences should be issued to responsible persons and an armed *chankidar* should be appointed in each village.

(b) Yes, I am strongly in favour of economic inquiry into the condition of cultivators and landlords and it should at once be taken in hand in some districts.

Oral Evidence.

39,503. *The Chairman*: Lala Sukhbir Singh, you are here on behalf of the United Provinces Zamindars' Association?—Yes.

39,504. You have provided the Commission with a note of the evidence that you wish to give; and you have also handed in a supplementary note, headed "Agricultural Note." Do you desire that that should be recorded as part of your written evidence?—Yes.†

39,505. Would you, first of all, tell the Commission what the objects of the Association may be?—The object of my Association is to improve agriculture all round, to safeguard the interests of the landowning classes, zamindars as well as cultivators, and to help the Government in legislation.

39,506. How long has your Association been in existence?—From 1896, that is about thirty years; and I have been its secretary from 1908. Before that my father was the secretary. I might also tell the Commission that I am a member of the Board of Agriculture, United Provinces, and I was a member for a long time of the Governing Body of the Agricultural College, Cawnpore. I am still a member of the Cattle Improvement Conference; and I am connected with almost all the agricultural movements in the United Provinces.

† See Appendix II, page 749.

39,507. On page 640 of your note, under the heading "Veterinary Research," you say that the animal diseases are becoming so varied and numerous that the practitioners do not even understand their nature. Do you think that the diseases are multiplying, or that more diseases are being discovered?—The diseases are multiplying; I mean to say that the old diseases are increasing very much.

39,508. No doubt your Association interests itself in the functions of District Boards. What have you to say about the finances of the District Boards in the United Provinces?—They are generally very good.

39,509. Have they enough money?—Yes.

39,510. Enough money to pay attention to the roads?—Yes; not only to roads but to everything; they do not, however, pay much attention to agriculture. The chief source of income to them is from agricultural cesses. Ten per cent. of the cesses goes to them, but they spend very little on agriculture. They spend all on roads and dispensaries, and little or nothing on agriculture.

39,511. Are you satisfied with the condition of the roads in charge of the District Boards?—Not at all; they are very wretched and very poorly kept up, and this is especially the case with the village tracks. In the rainy season, no carts can pass over them.

39,512. Let us take the roads under the District Boards first; the better class of roads under the District Boards are not properly looked after?—No.

39,513. How do you account for that?—There are several reasons, and one of them is the money question which stands in the way.

39,514. But I thought you told the Commission a moment ago that these District Boards usually had no difficulty about money?—They have plenty of money, but the question of distribution is the chief thing. If you possess a lakh of rupees and distribute that sum without careful attention, then the result must necessarily be *nil*. Both money and the proper distribution of it are essential. Formerly, the United Provinces Government used to give contributions to those Boards which were in deficit, but now, as far as my knowledge goes, every District Board is in a sound financial condition.

39,515. Would you turn to page 645 of your note. You say, "Recurring and non-recurring grants should be given by the Government to students of agricultural colleges and schools who start farms on modern lines, and control should be kept over such farms in the same way as over aided schools and colleges." I just want to clear up the point. Do you suggest that these grants should be given to students while they are at the agricultural colleges or after they have left?—After they have left.

39,516. That is to say, they would be ordinary farmers who had passed through the agricultural college?—Yes, those students who pass through the college should get some help to start their business.

39,517. But you use the word "recurring"?—Yes, I mean recurring as well as non-recurring.

39,518. You really suggest that Government should year by year hand over a certain amount of money to farmers who happen to pass through an agricultural college?—Yes, up to a certain time, and when the farmers become self-supporting, then there will be no need for any such grant. Government should give them some help in order to enable them to start their business or farms.

39,519. Would you turn to Question 8, Irrigation. At the bottom of page 646 in sub-paragraph (b), you say: "The existing methods of distributing canal water to the cultivators is not satisfactory, as water is not

supplied at the time when it is required and the quantity is not sufficient." Has you Association any views as to the possibility of extending in the United Provinces the practice of combining irrigation by well water with irrigation by canal-carried water?—I do not understand what you mean.

39,520. Do you know of instances where irrigation of any particular lands by canal is supplemented by irrigation from wells?—If I understand you aright, I may say that, when the Deoband branch in my district was opened, a condition was laid down that the canal water should not be supplied to those lands that were irrigated from wells.

39,521. Do you know of no case where, at certain seasons of the year, canal water is available and is used on the same land on which well water is used at other seasons?—It could be used. My point was that there were hundreds of wells to irrigate the land, and it was made a condition that no canal water would be given to those lands, but gradually canal water was given and those wells are out of order.

39,522. But why should cultivation not be carried on by well irrigation at such times in the year as the canal-carried water is not available?—Because the tenants have no means of taking the water from wells. Once they get canal water, they sell everything; they do not keep the wells in order and they cannot bring them into use at once, for that would mean a lot of expenditure.

39,523. You do not think that the two methods can be combined?—It is very difficult.

39,524. Do you not know that such cases exist?—Yes, they do exist, but they are very few.

39,525. On page 649, in answer to Question 12, you deal with the question of cultivation; you say the existing system of tillage is defective as the tillage is not deep enough for want of good and sufficient number of bullocks. You suggest there that the limits of the tractive power make it difficult to introduce more efficient agricultural implements?—Yes.

39,526. Is it a question of shortage in the number of bullocks available, or is it a defect in the quality of the bullocks available?—Both, the number as well as the quality.

39,527. Is there a shortage of bullocks?—Yes, a great shortage.

39,528. What is the price of a pair of plough bullocks in the United Provinces?—The average price at present may be taken as Rs.200 for an ordinary pair of plough bullocks; for a good pair the price goes up to Rs.400.

39,529. Has the price risen of recent years?—Yes, within my knowledge it has gone up four times.

39,530. And you tell the Commission there is a shortage of working bullocks?—Yes, I think the number of bullocks at present used by the cultivators is about one-quarter what it ought to be.

39,531. Do you suggest that four times as many bullocks as are at present in work might be used?—Yes, at least four times are absolutely required.

39,532. *Mr. Calvert*: The figures given to us indicate that you have twice as many bullocks as you require in the United Provinces?—No.

39,533. *The Chairman*: I wish to know how your evidence-in-chief should be interpreted. That is your view, that you could with profit use four times the number of bullocks that you are using in the United Provinces?—Yes.

39,534. On page 650, you suggest that the export of serum should be prevented. Do you found yourself on the fact that occasionally serum is not available in the United Provinces? Is that the position? Have

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you known cases where serum is not available?—No, I have not come across such cases.

39,535. Then I do not quite see why export should not continue if there is no shortage in India?—Because so many cattle have to be killed in the preparation of the serum which is exported. When there is already a shortage of cattle in India, why should they be killed to prepare serum that is to go out of India? I have myself been to Muktesar and I have seen there how cattle are killed and how serum is prepared; I think the export should be stopped; we should only prepare as much serum as is required in the country.

39,536. On page 652, you are dealing with the problem of forest areas in relation to agriculture, and you suggest that the quantity of fodder available might be increased by making arrangements to produce fodder crops instead of grass; do you mean fodder crops in the forest?—Yes, wherever it may be possible.

39,537. What sort of fodder?—Ordinary fodder for the use of village cattle; now no fodder is grown there.

39,538. I want you to tell the Commission what crops you are thinking of?—There are many kinds of grasses that are now coming to notice from other countries.

39,539. But you say fodder crops instead of grass; do you mean they should plant fodder grasses in place of the wild grasses at present growing? Is that the idea?—No, my idea was that, instead of wild grass, if some better class of grass or fodder were grown, it would be more useful for the village cattle. The present grass is very useful, but if some superior kind of grass or fodder were grown, it would be more useful; that is my idea.

39,540. On page 654, under Question 24, which deals with the problem of attracting capital to the land, you suggest that the Land Revenue and Rent Acts in every Province are the main factors tending to discourage owners of agricultural lands from carrying out improvements. Will you please develop that?—As far as my opinion goes, I think the present land revenue and tenancy laws are most defective and require overhauling; my opinion is, that as long as these laws and regulations remain as they are, you will not be able to get more investment in land. You see, every investor and moneylender wants some return for his money, either in the shape of interest or produce; when there is no certainty of a return I do not think anybody will come forward and give us money for the improvement of agriculture. At present the laws and regulations about land assessments are quite vague and uncertain; the whole thing depends upon the Government; there is no Act on the subject. A Parliamentary Committee very strongly recommended legislation; in the United Provinces a Bill was drafted, but it was withdrawn by the Government, I do not know why. Of course, they advanced some reasons, but I do not agree with those reasons. When the Bill was drafted it ought to have been passed, but the Bill was withdrawn and the position is now as it was before.

39,541. If I understand you aright, I think your suggestion is that the uncertainty of what exactly the assessment is going to be is one of the disturbing factors?—Yes, quite.

39,542. Does that disturb the landlord as well as the cultivator?—Yes, both of them.

39,543. Would your Association be in favour of a tax on agricultural incomes?—No.

39,544. That would enable you to know exactly where you stood, would it not?—If land revenue were remitted and an income tax put on all incomes, I do not think we should have any objection.

39,545. Do you speak with the authority of your Association on that point?—No, I speak on my own personal authority; in my opinion, it will go a long way towards facilitating matters if the land revenue is remitted altogether and income tax is put on all incomes, as is the case in England.

39,546. *Sir Ganga Ram*: What share of the gross produce does Government take now?—Government takes about one-quarter of the produce of land.

39,547. Of the gross produce of the land?—Yes.

39,548. They say they only take 2 per cent.?—Do they give any facts and figures?

39,549. They have given that as an average, that they only take 2 per cent.?—There may be some misunderstanding.

39,550. It is a very vital question. What share of the gross produce does Government take now in the form of land revenue?—I think it takes about one-fourth. If you put the value of the produce at Rs.200 per annum, the Government will take Rs.50.

39,551. *Sir Henry Lawrence*: Are you aware that there is a discrepancy between your estimate of 25 per cent. and the Government estimate of 2 per cent.? Were you aware of that discrepancy before?—I have just heard of it from *Sir Ganga Ram*.

39,552. Did you not know before that Government's estimate was 2 per cent. of the gross produce?—I have never heard that before. It is quite absurd.

39,553. You have never enquired into it?—No one can say that it is 2 per cent. of the gross produce.

39,554. Is that not on record in the various Settlement Reports?—I have not seen it.

39,555. Have you seen any Settlement Reports?—Yes, hundreds of them.

39,556. Is it not stated there?—No.

39,557. *Mr. Culvert*: What proportion of the gross produce is taken as rent by the landlord?—Generally about half. If the gross produce is worth Rs.200, the rent will be Rs.100.

39,558. What is the Government order as to the proportion of rent which is to be taken as land revenue?—I am afraid I do not understand the question.

39,559. Land revenue is taken, not on the gross produce, but on the rent. What proportion of the rent does Government take?—It varies according to the district. The rule generally followed is the Saharanpur rule, which is 50 per cent.

39,560. *Dr. Hyder*: Is the Saharanpur rule followed? Does the proportion reach a maximum of 50 per cent.?—It goes even to 55 per cent. in some cases. I have seen that myself. The general rule is to make assessments from 45 per cent. to 55 per cent.

39,561. I thought that was the theoretical limit?—No, it is not only the theoretical limit but the practical limit. The general rate for land revenue at present is about 50 per cent.; the Saharanpur rule is usually followed.

39,562. *Sir Henry Lawrence*: The Government themselves say that the maximum percentage of rent on gross produce is 17 per cent.; the rent varies from 5 per cent. to 17 per cent. on the gross produce?—I have not worked out these figures; but, as far as my knowledge goes, the rental is Rs.100 out of Rs.200 and the Government revenue is Rs.50 out of Rs.100.

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I say ordinarily; there are, of course, exceptions; but generally, I understand, the rental is half of the gross produce and the land revenue is half of that.

39,563. We went to a private farm on which the value of the gross produce was Rs.200 per acre and the land revenue was Rs.3 per acre?—It might be so in Bengal, where there is a permanent settlement.

39,564. Is not the land revenue in these Provinces, on an average, Rs.2 per acre?—It may be so, but that is Rs.2 per acre and not a percentage on the produce.

39,565. You say that the value of the gross produce is only Rs.8 per acre?—No, I do not say that.

Yes, because if Rs.2 is 25 per cent. of the total, the total must be Rs.8.

39,566. *The Chairman*: You are giving evidence on a very important subject, and if you are not clear on the point, I suggest that you reserve your answer and let us have it in writing*?—That will be better, because it is a very important question. I am told by Sir Ganga Ram that Mr. Lane, who was a Settlement Officer in my district, has stated that it is only 2 per cent. of the produce. I think he wanted to say that it was Rs.2 per acre. There is some misunderstanding there. I should like to see these papers and then say what is, in my opinion, correct.

39,567. And, perhaps, you would reinforce your views by one or two concrete instances*?—Yes.

39,568. *Sir Ganga Ram*: You know that partition of land is now governed by the Hindu law of inheritance. What are your views on that? Is that in the interests of the country, or should it be stopped at a certain stage and the law of primogeniture applied?—That is a very difficult question. My opinion has always been against partition. I am not in favour of partitions and divisions. They are ruinous.

39,569. At what stage would you put a limit to partition? Would you stop it altogether?—Some standard ought to be fixed below which no partition should be allowed.

39,570. That is a very important question?—Yes.

39,571. If you like to reserve your answer you may do so?—My clear opinion is that as far as possible no partitions and divisions should be allowed.

39,572. That is an important qualification?—It not only affects holdings, but also property.

39,573. *Professor Gangulee*: What is the view of your Association about partition? Is the view that you are expressing now your own or that of your Association?—There are two questions, the partition of property and partition of holdings. About the partition of holdings, the view of the Association is that holdings should not be divided. About property, the Association has not been consulted as yet; it is my personal opinion that property also should not be partitioned.

39,574. *Sir Ganga Ram*: What property? Landed property?—Yes.

39,575. *Sir Thomas Middleton*: Have you got working cattle of your own? How many pairs do you keep for your land?—Generally we get four bullocks for about 100 *bighas* of land.

39,576. That is about 20 acres?—Yes.

39,577. Two bullocks for 10 acres?—Yes, generally speaking.

39,578. How many days' work in the year do the bullocks do? Are they working four, six or eight months in the year?—It depends upon the quality of bullocks and also upon the nature of the soil and the work.

* Not received.

39,579. I am asking about your bullocks. How much work have you got for them?—I think there is so much work that they cannot finish it. They are always working.

39,580. How much food do you give to your bullocks?—I allow one seer of gram for every bullock, and sufficient *bhusa* or *chari* or grass from my gardens and farms.

39,581. Do you give them one seer of gram every day?—Every day.

39,582. Do you give them more food when they are working harder?—No, we give them that every day.

39,583. Do you allow anything for your milch cows?—Yes.

39,584. How much?—We allow them some barley also and some *khal*.

39,585. If a cow is a good one, how much would you allow?—If the cow is a big one, it requires more and less if the cow is a small one.

39,586. Suppose a cow is giving five seers of milk a day. How much would you allow it?—To a cow giving five seers of milk a man will give at least eight or ten annas worth of gram, *bhusa*, etc. If the milk sells at four seers to the rupee, a man gets Rs.1-4 for five seers, out of which he will spend, say, half, or 12 annas, in feeding the cow, and the rest he will keep for himself. That is the common custom here. But generally the cattle are not properly fed. There is not sufficient fodder or *bhusa* and gram is very dear. When the people cannot afford to fill up their bellies, how can they properly feed their cattle?

39,587. I think I heard you say there are not enough cattle in the country?—That is so.

39,588. But if you do not feed those you have, how are you going to have additional cattle?—As population is increasing and God is feeding them, so increased cattle will be fed by God.

39,589. That is too simple a solution?—It is the simplest, and nobody can deny the truth of it.

39,590. You say that you keep a pair of bullocks for every ten acres. Supposing you employed two pairs of bullocks for every ten acres, could you make good use of them?—Yes, we could grow better crops.

39,591. You think you are under-cultivating your land?—Yes.

39,592. *Sir Ganga Ram*: Are you speaking of irrigated land or dry?—Of land irrigated by wells and canals.

39,593. Can you do with two bullocks for ten acres on well-irrigated land?—We cannot do, but we cannot afford to keep more. I think that we should have better bullocks and more bullocks so that land may be properly ploughed, properly tilled and properly manured, but the fact is the tenants cannot keep a sufficient number of bullocks or bullocks of good quality.

39,594. *Sir Thomas Middleton*: That is because they do not feed them properly?—They cannot feed them. They have no pasture or sufficient fodder or sufficient cheap grain. Even salt is taxed.

39,595. I heard you suggest that fodder crops should be grown on waste land. Why do the owners of the bullocks not grow fodder crops?—There are many difficulties in the way, such as the Land Alienation and Assessment Rules.

39,596. Is it because it does not pay them?—That is one of the reasons, of course.

39,597. What are the other reasons?—The other reason is that they cannot get big plots of land. What they get are small and scattered plots here and there. There are rights of various kinds, occupancy rights and non-occupancy rights, which stand in the way. I am a big zamindar and I cannot have 200 acres of land at one place for my own cultivation.

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39,598. Then, with all these difficulties, it is clear that if the cultivators had more cattle they could not feed them?—They could grow better crops.

39,599. But they do not feed those they have got?—They cannot grow more; their holdings are not sufficient in number; they have to grow wheat and sugarcane, etc., and then on whatever poor lands they have they grow fodder.

39,600. *Professor Gangulee*: Has your Association taken any active interest in the co-operative movement?—The Association is in favour of this movement, but it has not taken up co-operation because in the district of Muzaffarnagar very little has been done in this respect. The Association is doing what it can, but I cannot say that it has done enough. The work there has only recently started and there are only about fifteen or twenty banks. There is no district bank as yet started. There is lack of money in these banks, for the cultivators want a lot of money for bullocks, seed and for sinking wells which these banks cannot afford to give.

39,601. Have you any primary societies in your villages?—I have these banks in several of my villages and I am doing my best to help them. I am one of the Directors.

39,602. *The Chairman*: Do you mean banks or primary societies?—I mean these village banks.

39,603. *Professor Gangulee*: I mean a primary co-operative society, a society from which the cultivators can borrow money?—We call them village banks in the United Provinces. There are several banks in my own villages and I am taking an interest in the movement; but, in many districts, little has been done up to now.

39,604. *Mr. Calvert*: You say that lakhs of cows are killed by the Military Department. Have you any figures?—I do not remember them now, but I moved resolutions and put question after question in the Council of State as well as in the United Provinces Legislative Council, of which I was a member for twelve years, to try to stop this indiscriminate slaughter of cows. I do not remember the figures at present, but this much I can say, that cows below the age of five years are generally killed in the cantonment slaughter houses.

39,605. You do not know that the Military never slaughter animals under five years in age?—They slaughter animals under five years of age.

39,606. Their order is not to slaughter animals below the age of five years; you have not heard of that?—No.

39,607. Have you actually any figures of actual slaughter for the British Army?—I have not collected them.

39,608. Do you think the slaughter of cows for the British Army in the slightest degree affects the total mortality of cattle in this country?—Yes, greatly.

39,609. To the extent of 1 per cent.?—It will go more than that, in this way, that the prime cows are slaughtered before they have any issue.

39,610. Do you think the slaughter of cattle for the British Army increases the mortality of cattle in this country by 1 per thousand?—There is no question of mortality. The question is that, in cantonments, cows under five years of age are killed.

39,611. You do not know that there is an order that cattle under five years should not be slaughtered?—I have never heard of it.

39,612. *Professor Gangulee*: Do you know of any import of Australian beef into this country for the use of soldiers here?—I think a certain quantity is imported; but the Commander-in-Chief said that if Australian beef is imported here it will cost much more than what they have to spend on the country beef.

39,613. Still they depend on the import of Australian beef?—There may be import to a certain extent, but not much.

39,614. *Raja Sir Rampal Singh*: You have told us that District Boards have got plenty of money, but the distribution of it is not properly made?—Yes.

39,615. May I ask you on what items do they spend more than is required under the present circumstances?—My submission is that District Boards ought to spend some money on the improvement of agriculture also as well as on roads, schools, dispensaries, and so on; but they do not give any attention to the improvement of agriculture at present. If they want to they can do that under the present circumstances.

39,616. By curtailing allotments on other items?—Of course that will have to be done; cuts will have to be made here and there.

39,617. Are they now expending more on certain items although they ought to spend less on them?—Yes; the whole question requires examination. My idea is that the distribution of money is not properly done. The income is sufficient because the cesses are going up in every district. As land revenue is increasing, the cesses are increasing too and my submission is that the distribution of money is not properly made.

39,618. Have you found out that there is any item on which they are expending more than they ought to?—I was a member of the District Board for many years. I do not remember the figures now; but, so far as I remember, there was no percentage fixed for expenditure on any department. There is some rule with regard to the Department of Education that the expenditure on that should be 8 per cent., or something like that; but as far as the other departments are concerned, there is no rule, no principle. The budgets can be prepared according to the whims and wishes of the Secretary or the Chairman. Most of the members do not know how the budget is framed, how the money is allotted; only a few know. It is not only the case with District Boards but it is the case everywhere; even in the Government we find the same thing.

39,619. You said that out of a gross income of Rs.200 the cultivator has to pay a rent of Rs.100. May I ask you how much the cultivator has to spend in order to get the gross produce of Rs.200?—I cannot give you the exact figures. But he has to spend money by way of canal dues, upkeep of bullocks, labour, seed and so on, and I think all this will come to Rs.50 or even more. That is if he gets Rs.200, he will pay Rs.100 out of them and spend Rs.50 or more on the other items and the rest he keeps for his own requirements. The poor man cannot save much.

39,620. There is no margin left for him?—Very little margin. The man has to work day and night and sometimes even the women and children work, and they are very poorly clad and very poorly fed, and for marriages and other things he has to borrow. In my knowledge, about 90 per cent. of the cultivators are in debt although many of them are occupancy tenants.

39,621. *The Chairman*: Would you like to tell the Commission one or two things which your Association has done in order to forward the interests of agriculture?—My Association is taking a very great part in the Government demonstration farm at Muzaffarnagar. The Government had an idea of abolishing the farm, but since the scheme put forward by the Association was accepted, it has begun to pay; the Association is taking active part in all directions.

39,622. *Sir Henry Lawrence*: On page 652 of your note, you deplore the importation of foreign sugar?—I find the imports are increasing.

39,623. You think they ought not to increase?—Of course.

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39,624. Do you wish to have some protective duties to stop them?—At present, there are some duties.

39,625. Do you wish to see those duties increased?—It is a question to be thought out, whether these duties should be increased or whether we should have more factories in the country to compete with foreign sugar.

39,626. What is your advice on the matter?—My advice is first of all to increase our own sugar production. Steps should first be taken to increase our own sugar industry so that we might not be in need of foreign sugar; and, in order to give an impetus to the local industry, there ought to be some protective duties; if they are not sufficient at present they should be increased.

39,627. At present the duties are for revenue purposes and your advice is that they should be made protective duties for the purpose of protecting the manufacture of sugar in this country; is that so?—Yes. Before I conclude, I want to invite the attention of the Commission to the book written by Dr. Voelcker, which I have in hand. He has made in this book many recommendations and has indicated what is required for the improvement of agriculture in this country.

(The witness withdrew.)

CHAUDHURY MUKHTAR SINGH, M.L.A. Pleader, Meerut.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) No.

(ii) In the whole Province, extension of teaching facilities is badly needed. The existing arrangement is neither efficient nor sufficient.

(iii) Yes. The teachers in order to be useful should have a first hand personal knowledge of the rural conditions under which a farmer has to work. It is then, and then only that the teacher will be able to grasp the farmer's point of view, and advise his pupils on the right lines.

(iv) The boys who attend these institutions do not go there with the idea of learning and following in their after life the profession of farming, but they go there with the sole idea that by undergoing instructions in these institutions, they will be in a position to obtain some job in the Agricultural Department or elsewhere. I know a number of students who have got very large tracts of land of their own at home and who are in a position to invest their money in farming, but have not the courage to take to the profession after completing their career at these institutions. They have taken to service on very low salaries. This shows that either the instruction given in these institutions does not sufficiently equip them with the information required for successful farming or the students lose their self-confidence. I know the case of a few people, who, after completing their courses both at vernacular schools and at the Agricultural College, took to farming and have miserably failed and were obliged to take to service.

This shows that there is something wrong somewhere in the instruction imparted or the training given at these institutions. Even if one student after finishing his career at the school or college becomes successful in his own farming, there is a chance of attracting a number of boys to these institutions. Personally I would suggest that a degree course in agriculture should be created in all the Universities of the Province, and students taking up agriculture as their subject, should in no way be considered inferior to those who have taken up an ordinary Arts or Science course for their degree examination. A graduate in agriculture would be a better revenue or civil officer than one who has studied Science or Arts. If we have a number of agricultural graduates as officers, the ideas of improved

methods of agriculture will filter down to every big zamindar who has a chance of meeting these officials, and a better understanding of the circumstances of the masses will be acquired by the officials. The science of agriculture is in no way inferior for developing the human intelligence to other sciences like mathematics, physics or chemistry.

If the idea is once conceded and agriculture is introduced as a subject in colleges and schools, I am sure the whole ideal of education will change, and we shall have really useful institutions in the country.

As regards special schools and colleges for teaching agriculture, I must emphasise the fact that the instruction at them should be given through the medium of the vernacular. The Government experts should disabuse their minds of the idea that the Indian vernaculars are fit only for giving a rudimentary instruction. If this be admitted, decidedly a better and more useful practical course of study would be prepared for vernacular schools of agriculture. Further, I may mention that at all these schools an arrangement of holding short classes for teaching the adult farmers should be held. The duration of such classes should not be more than a week and also an arrangement for extension courses, i.e., agriculture taught by correspondence, should be made at these schools. What should be taught and what should not be taught at these schools is a matter of detail, and this is not the place to discuss it.

As to the Agricultural College, its control should be in the hands of the University and not in the hands of the Department of Agriculture. The Government of the United Provinces admitted the soundness of this view several times and it promised to give it practical shape more than once, still the actual transfer of the college to the University has not taken place, and there seems to be no likelihood that it will take place in the near future. Unless this is done, men with sound training in scientific agriculture will not be available and without this reform the prospects of extension of sound agricultural education will not be improved.

If, now, a sufficient number of boys are not attracted to these institutions, it is not the fault of the people but that of the education itself. The sooner the changes are effected the better.

(v) Service.

(vi) Not generally, but even where they are drawn from the agricultural classes, the incentive is the same. A student who reads at the school (primary, middle or high school) becomes unfit to follow any other walk of life except service. He becomes physically unfit to take to any profession requiring manual labour. A disgust towards manual labour is created, and the education, being mostly through the medium of a foreign language, puts a great strain on the mental faculties of the student and his health is undermined. Thus, even if all the boys are drawn from the agricultural classes, the object will not be achieved.

(vii) As already mentioned in answer (iv), the whole of the curriculum, the whole ideal, has to be modified. The boys should not be stuffed with theoretical knowledge, but they should give sufficient time to practical training, and should be forced to work as labourers in the fields with their own hands and to look after the cattle and implements themselves. I wish that a boy or a number of boys should be put in charge of bullocks and a plot of land for their own experiments, without any labourer to help them.

(viii) (a), (b) and (c) I have no faith in (a) nature study nor in (b) school plots. The teachers who are asked to teach these subjects have neither sufficient training nor sufficient capacity to teach these subjects. It is simply a farce, waste of time, money and energy.

I am in favour of having farms attached to every school, provided the course of study at the school be so amended as to give a sort of vocational training. The teachers, in that case, will have to be specially trained in the subject of agriculture, so that they may take pleasure in working

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up these farms with their students. The only precaution to be taken would be to prevent the teachers from turning it into a private business of their own.

(ix) The majority of the students have taken to service in the Agricultural Department, and others, who could not secure a job in the Department, have had to take up to other service in other departments which have no connection with agriculture.

(x) Agriculture can be made attractive to the middle-class youth, provided there be educated people taking to agriculture, and it can be shown to the world that the educated farmer gets more than an uneducated one. It would be a great incentive if some of the Government officials serving in the Department of Agriculture were to take to farming after retiring, but I am sure they would prefer to serve in some State rather than risk their time and money in following the profession.

(xi) No, not to my knowledge.

(xii) Adult education in rural tracts can be popularised by introducing night schools, half-time schools, by publication of good books in the vernaculars of the Province and by holding short and extension courses. The course of study, for night schools and half-time schools, should consist of ordinary reading and writing, working out small sums in arithmetic, and agriculture. After the ordinary course of education at these schools is completed, there ought to be an adequate arrangement for keeping up their knowledge up-to-date. There should be libraries to achieve this object. The Government should see that good books on agricultural subjects are published and the authors encouraged by making purchases for these libraries. No attempt has so far been made to get good books written on agriculture. It will be surprising to know that, under confidential orders, the editors of agricultural journals and agricultural officials are prohibited from writing reviews on books written by private persons. Every attempt is made to discourage rather than encourage such literature. Private attempts to publish such literature are bound to fail if people are discouraged from taking up this work. The literature produced by the department through journals is simply third class and worthless. The agricultural journals should contain subjects of a higher standard than they contain now.

(xiii) (a) The administration of the vernacular agricultural schools should be in the hands of District Boards, but, as far as high schools or diploma schools go, the administration should be in the hands of the Intermediate Board of Education. The college education should be in the hands of the University.

(b) The finances of the schools under District Boards will be under the control of the District Boards and grants will be given by the Government as in the case of other schools, and the finance of high schools and the college will be done by Provincial Governments helped by the Imperial Government.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) The most successful measure in influencing and improving the practice of cultivators is that of introducing practices at some private farm of a cultivator or a zamindar. If found successful, they would be at once taken up by cultivators, provided it were within their means to follow them. Demonstrations given at Government farms are not taken up by the cultivators for two reasons, firstly, they are conducted by people of more intelligence and money, and secondly, the cultivator considers that the advantages of the practice advocated are very much exaggerated. Besides, he considers that it is beyond his means to follow a practice taken up at the demonstration farm.

A non-official agency invokes more confidence than an official agency. I consider, therefore, that the best method for propaganda would be to

give small grants sufficient to make good the loss that might be incurred in case of failure of experiments on private farms. The Court of Wards can be utilised to introduce improved systems of agriculture in estates under their management. Jails are very good places in which to teach the system of improved agriculture to the adults.

(b) The method of field demonstration, as followed at present, is very extensive and can hardly be managed by the number of demonstrators employed. Demonstrators are unable to devote sufficient time to watch the results of their demonstrations and thus the demonstrations are not very encouraging. I would suggest that a *pargana*, or a few villages in a *pargana*, may be the centre of activity for a demonstrator, and he should devote his entire energy to field demonstration in that area. The demonstrator should change his field of activity when the practices advocated are fully understood by the people of the area in which the demonstrator has begun his work. It does not matter if it takes long to popularise a certain practice in the whole district. I do not believe in the general assertion that the Indian cultivator is conservative in adopting a new suggestion. I have seen people taking to a new suggestion at once, when they came to have confidence in the man who suggested the practice, and when they were convinced that it was within their power to adopt the practice advocated. The fact is that there is very little which the demonstrators can give to the cultivator. The seeds advertised and the implements advocated are sometimes not believed to be better, even by those who advocate their use; but, as I have suggested elsewhere, the demonstrators are at certain times forced to advocate what they do not believe themselves to be useful and beneficial and naturally they do not have the same enthusiasm about those practices. The second defect is that circles are divided without any regard to climate, soil and seasons and the area under a circle is very extensive; when any practice is found to give good results in any year at a farm, it is considered to be a good practice for the whole of the circle. This is decidedly a wrong method. We should make it a point to know under what circumstances a certain practice or seed will be useful and we should advocate that practice or seed for the same set of circumstances. While advocating a new seed or a new practice, we should fully analyse the merits and demerits of the same, and without hesitation give out true facts as they have been found to exist. I have not found any demonstrator giving the demerits of new seed or new implements. He rather sees nothing but good and good only in the new seed or the new implement and he recommends the new seed or the new implement for every soil and climate. Personally I cannot believe that any implement, seed or practice of agriculture would be useful everywhere irrespective of differences of climate, etc. These are necessary factors to be taken into consideration in such matters. If the above precautions were taken, I am sure the method of field demonstration would be very much liked by the people.

(c) The expert has simply to convince the cultivator that the method advocated comes from one who is easily accessible to him and with whom he can talk without reserve.

When a new disease appears or a natural calamity visits the poor cultivator, the expert has the best chance of showing his ability. I may be excused if I say that the experts do not care to gather local experience as much as they ought to, and they do not like the idea of mixing with the cultivator and realising his difficulties, and therefore, naturally, the suggestions that they make are mostly beyond his intelligence and means. A better understanding between the cultivator and the expert is necessary before you can expect the cultivator to refer his difficulties to him and to follow his advice. The Indian cultivator being illiterate and poor does not know whom, and how to approach, and secondly, if he approaches he cannot have a free discussion with the expert as he cannot explain his

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difficulties in the terms of the expert's ideas, nor can the expert explain himself in the language of the cultivator.

(d) A striking instance of success is the adoption of three rollers cane-crushing mills. As soon as it was proved that an iron cane-crushing mill was better than a wooden mill, it was at once adopted by the cultivator throughout the whole Province, wherever the cane crop was growing. In the same way, the boiling pans consisting of one piece are replacing the old boiling pans consisting of small pieces riveted together. A third instance of striking success is the adoption of a new furnace for boiling cane juice in the Meerut district. As to striking failures, I can give an instance of Mr. Hadi's system of sugar boiling. The department advertised the system as much as it could but everybody who followed it was a loser. It was only after great difficulty and public criticism that the practice was condemned by the department itself.

QUESTION 4.—ADMINISTRATION.—(b) No. If there is any necessity of increasing the staff in a Province, the Provincial Government should be the final arbiter. Personally, I do not like the idea of having a number of services under the control of the Imperial Government and given to the Provincial Governments. Every subordinate of the department should be subordinate to the Provincial Government and his salary should be votable by the Provincial Council. The system, as it exists now, is very objectionable. Some of the high posts in the department are held by Imperial service men who do not consider themselves to be subordinate to the Minister or to the Provincial Government. That creates a sort of dissatisfaction in the minds both of the subordinate and of the Minister. This anomaly should cease and there should be a perfect provincial autonomy, as far at least, as the transferred subjects are concerned.

It is never advisable to have scientific experts under the Imperial Government and lend their services to the Provincial Governments or to put them on special duty in a Local Government. The Provincial Governments should be free to decide what sort of investigation they require and whom to engage for the investigation of the problem.

(c) (i) No. The Agricultural and Veterinary Services are not giving as much service as they could give. The causes I have dealt with in detail elsewhere, but the main cause as regards the Agricultural Service is that there is a great deal of centralisation and the subordinates are not given a free hand to acquire knowledge for themselves and to advocate practices, of the soundness of which they themselves are convinced. They receive instructions for every minor thing from above. As to the Veterinary Assistants, they are lent to District Boards and are under the control of the Provincial Government. The result is that diarchy does not work properly and there is always a conflict between the officers and District Boards. As to the services of dairy experts and the cattle breeding section, it is a new thing started in the Province and it is too early to express any opinion.

(ii) Railways are not benefiting the cultivator, as much as they might. The freight charges for trade within the country from one place to another are very high and sometimes prohibitive, which forces the cultivator to send articles from one place to another by bullock-cart instead of by rail. Rolling stock in the busy seasons is generally not available in sufficient quantity. The freight charges on fodder and implements should be very low, so that in days of scarcity of fodder the cultivator might be relieved of his difficulties to some extent. Implements manufactured in the country have to pay much higher rates than an imported article from a port to any station in the country.

The charges of steamers are very low in comparison to railways and this is why no industry can compete with an imported article. The Railway Board should make it a point to give special rates from the place of manufacture

or the place of export of agricultural produce to important markets in the country, so that agricultural produce and implements may have free movement, at least in the important centres of the country.

There are very big areas lying practically waste which have no connection facilities and which can provide a large amount of fodder and fuel. This is especially the case in regard to the area lying on the banks of the Ganges *khadar*. If a branch railway line were constructed at a distance of some miles from Ganges and parallel with the Ganges, the whole *khadar* area would be linked up with the *bangar* area and the fodder difficulty would be removed to a very great extent. There is also a likelihood of improving the agricultural conditions of the place. In Meerut district alone, thousands of acres of land can be very well utilised. Fodder in this part is available at a very nominal price but by the time it reaches the city the cost of cartage becomes sometimes higher than the price of the fodder itself. I am sure the same would be the case elsewhere.

(c) (iii) The *pucca* roads in the Province are not of sufficient length. A regular survey of every Province should be made and a programme for building *pucca* roads in every district be decided upon as soon as possible. Good communication is the secret of agricultural improvement. Not only do the markets become accessible but, at the same time, the general condition of the people is very much improved on account of their coming into contact with the people of other places. I learn that the Punjab Government have decided to build up a number of miles of *pucca* roads every year. The same scheme may be adopted by other Governments but I do not consider that there is likelihood of this being done by Provincial Governments unless they are sufficiently helped by the Imperial Government.

In order to make a successful attempt and to cut down maintenance expenses of *pucca* roads it seems necessary that some metal other than the *kankar* nodule should be found. In the first place the *kankar* nodule is not available in sufficient quantity in each district and, secondly, the heavy traffic impairs the road and shortens its life, thus increasing the cost of annual repairs. The life of roads has been reduced in the last decade from six years to four years and I am sure it will be further reduced to three years in the next decade. The engineers should decide upon the metal for different districts in accordance with the local conditions and the availability of the material. I may be allowed to mention one point more in this connection. During the last 25 years the engineers have reduced the breadth of *pucca* roads from 12 to 9 feet. This has further shortened the life of roads and has increased the maintenance charges enormously. I consider it to be a mistake to shorten the breadth of *pucca* roads. Whatever we save in the initial cost, we spend much more in the maintenance.

In order to relieve traffic over *pucca* roads and in order to reduce maintenance charges, I would suggest that a portion of these roads be set apart with a fencing on one side for running heavy lorry traffic on iron rails and the monopoly of running these lorries be made over under certain rules and conditions to some reliable men for five years. If the monopoly be allowed the contractors will be perfectly willing to pay a decent amount annually, and this amount will go towards the upkeep of the roads.

By extending the length of *pucca* roads in every district, the income of railways will be very much increased and therefore the public has a right to demand a certain percentage for this improvement from the railway head.

The *katcha* roads are in a very bad condition. Every year they are washed away and they become lower and lower. There seems to be no method of improving them easily. All these roads should be made *pucca* as soon as possible. The village tracks are daily encroached upon, and the village communications are suffering very badly. I consider the time has come when by law all these village tracks should be acquired by District Boards and maintained by them. If only the encroachment is made penal, I am sure

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the conditions will improve. Under present conditions nobody is the owner of a village track and therefore every owner of the adjoining field considers the land to be his, and gradually includes the land into his own field. The Government should arrange, through District Boards for the demarcation of these tracks as soon as possible and the demarcated portion should vest in District Boards. The village panchayats should be held responsible for keeping these tracts intact.

(c) (iv) From the agricultural point of view, the Meteorological Department is of no good. The forecasts are generally wrong. There is no co-ordination between the Meteorological Department and the Agricultural Department. The department should be better equipped if it is likely that its forecasts will benefit the farmer. If, on the other hand, the conditions of the country are such that no forecasts are likely to be reliable it is no good spending money over the department, from the agricultural point of view.

(c) (v) The postage on postcards and envelopes should be reduced and I am sure that, by so doing, the income of the department would go much higher within three years. Even if it does not go high, the Government should restore the old rates.

The postage on letters written for the same district should be further reduced. This will considerably increase the number of letters and consequently the income. The parcel rates on agricultural samples should be reduced and bigger parcels should be received by post.

(c) (vi) The rates of telegrams, especially business telegrams, should be reduced to 6 annas. The telephone charges also are very high and should be considerably reduced. I consider the time has come when private companies should be encouraged to take up this enterprise and put up their own telephones.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) The main cause of borrowing is litigation. The responsibility for litigation rests on *patwaris*, *lanungos* and the police, and improper legislation and the rulings of higher courts. The Revenue Department, as far as these subordinates go, and the subordinate police require complete overhauling. The Government should have better responsible officers to look after these subordinates. The attention of Government has been several times invited to them and still it is a cry in the wilderness. The other cause of indebtedness is that agriculture is the main-stay of the people in general. Whenever and wherever a crop fails there is no other job for the people to fall back upon. Thus we find that there is famine practically once in every fifth year and the four years' hard labour of the cultivator is hardly sufficient to make up the loss sustained from one year's famine. The cultivator is not well protected to fight against physical calamities. The third cause of indebtedness is the illiteracy of the cultivator. If a cultivator is once entangled in the clutches of an unscrupulous moneylender, he can hardly ever get out of them. Not only he is to guard against the sharp practices of the moneylender but he is also to guard against the misleading advice of a more or less educated villager who earns his living by acting as a legal adviser. Half-educated people in the village are more dangerous than illiterates. If an attempt be made to widen their source of knowledge after finishing their education, through moving or stationary libraries, the evil may be mitigated to some extent.

Generally indebtedness is considered to be due to marriage and funeral ceremonies and other luxuries. This may be correct in the case of zamindars but it is incorrect in the case of cultivators. Besides, a poor man must be allowed some opportunity to enjoy himself sometimes, and if he spends a bit more than he ought to have spent, a lenient view ought to be taken.

(ii) The main sources of credit are the moneylenders and the co-operative banks, traders in cattle and seed grain.

The trader in cattle sells the bullocks at nearly three times the price in this district, which he stipulates to recover in three or four instalments without interest. But before the time of the payment of the last instalment arrives the bullock becomes unserviceable and it is taken back by the trader in lieu of one of the instalments and another bullock is supplied, and so the cultivator remains always indebted to the trader. Similarly, the seed is supplied on the *sawai* system, which means that for each seer borrowed the cultivator has to deliver $1\frac{1}{2}$ seers at the harvesting time, i.e., 25 per cent. in six months.

(iii) The cultivator is so hopelessly in debt that he never considers it to be a possibility to get rid of his debts once for all. He naturally defers all his purchases till the time of harvesting the crop. As soon as the crop is ready, he first supplies his own wants and when they are supplied there is hardly anything left for repayment.

In a good many cases the crop of the cultivator is attached or distrained before it is ready and in such a case he hardly gets half of what it is worth. He is not allowed to touch it and the bailiff never cares to protect it. The whole system of attachment of crops should be revised so that a better valuation of the crop may be possible. If courts are unable to do this, I would suggest that every crop should be sold as soon as possible after attachment instead of keeping it for a long time in the hands of bailiff. I know of cases in which the whole crop lay in the barn unthreshed and could not be gathered and ultimately the rains washed it off and nobody was held responsible for it.

(b) The first measure to be adopted is to increase the cultivator's sources of income. I consider that the system of co-operative banks in Denmark is the ideal for this country, and if co-operative banks were run on these lines, the income of the cultivator would be considerably increased and he would be well off in a very short time. I would suggest that one district or one tahsil should be taken as a unit and the experiment should be tried with all vigour in that tahsil or district.

When the experiment succeeds and all difficulties are overcome, the experiment may be extended. The other method, that I would suggest, is to give the cultivator long term *faccavi* loans. Thirdly, subsidiary industries should be provided in every rural area, so that the cultivators' incomes may be considerably increased and they may be in a position to fall back upon these resources whenever their crops fail. Fourthly, there should be co-operative banks for the redemption of mortgages and legal facilities should be provided for the introduction of such societies. Fifthly, some sort of Loans Act is necessary but no Act will be able to solve the difficulty unless and until the Government makes an attempt to remove illiteracy amongst the masses. What is wanted is to provide facilities for lending money to the cultivator on easy terms and at the proper time. It is not the real amount advanced to the cultivator that he has to pay, but the cultivator is cheated to great extent. This cheating cannot be done away with by any Act of the legislature. Even if Government passes an Act against the validity of contracts of high rate of interest, I am sure the principal will be inflated at the time of advancing the loans and thus the main object will be defeated and the remedy will not be effective. Sixthly, the Famine Fund in every Province should be utilised to provide means to the cultivator by which he can very well fight out his battle with natural calamities.

(c) No. In order to save zamindars from running into debt, the Department of the Court of Wards should be better equipped. It should be able to take estates, especially those of women and children, under its management. Even in cases where the income is not more than Rs.1,000 a year, the estates may be put under the charge of Court of Wards and the Court of Wards should make free use of giving these estates further on *theka*

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to cultivators or others, so that the charges of realisation and management be very small.

The system adopted by the Court of Wards at present for repaying the loans of the wards is defective. What the Court of Wards does is to fix a maintenance allowance for the proprietor, to charge a certain percentage for management and to utilise the rest of the income for the repayment of loans. The percentage charged for collection and management is rather high, being from 10 to 12 per cent. No improvement is made in the estate. The income is not increased. The object of putting an estate under the charge of Court of Wards ought to be not only economic management but also the improvement of the sources of income. This can be done by placing the estates under the charge of persons who are trained in the management of zamindari property and are experts in reducing the expenditure and increasing the income. I know of no district in the Province where the Court of Wards have made attempts to improve the existing system of agriculture.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) Yes. It was very unfortunate that the United Province Legislative Council did not see its way of enacting necessary changes in the law in connection with the consolidation of holdings at the time of the passage of the Tenancy Bill, though a section was entered in the bill. In the United Provinces there are a number of holdings less than an acre in area. A very experienced officer was put on special duty to suggest means for the consolidation of holdings, but unfortunately no step has so far been taken to give his suggestions a practical shape. On the contrary, provision has been made for the division of holdings in the new Tenancy Act. The section may be very good and conducive to guarding against unscrupulous partners of a holding, but it cuts at the very root of the principle of the consolidation of holdings. The income from farming would be at least 25 per cent. more than what it is now if the area of a tenant's holding was compact. In every partition, some fields are bound to be sub-divided and the number of fields of very small area is constantly on the increase. I would suggest that the revenue law should be so amended that no division of a field should be of less than an acre in area, and if it be found that, on account of this rule, any co-sharer gets less land than he is entitled to, he should be compensated in money. The rule may only be relaxed in the case of small plots adjoining the *abadi* land or if they adjoin other fields of the co-sharer in other *khevats* or *mahals*. It is further necessary that a new bill should be introduced to consolidate small holdings of tenants and the consolidation of *sir* and *khudkasht* land. There ought to be, similarly, a provision for the consolidation of *sir* and *khudkasht* holdings in *bhaiyachara* villages.

(b) The main difficulty in the consolidation of holdings is the ownership of different zamindars. This can be overcome if the basis of partition be rental and not the quality of the land. The other obstacles are the tenants themselves. It is idle to consider that it is likely that tenants or zamindars themselves would agree to the consolidation of holdings. The experiment has already been tried in the Punjab and has not been very successful. Unless people are forced by the legislature, nothing can be achieved. The main point of which I am afraid is that the subordinate officers, the *amins* and the *patwaris*, in whose hands the work of partition actually is, would have a weapon in their hands for squeezing out as much money from the petty co-sharers as they possibly could. If Government is keen on introducing this reform, it will have to appoint very reliable people to deal with this matter, and will have to keep a very strict watch over their doings. If Government be willing to do this, it will not be difficult to carry the measure through the legislature.

(c) Yes. Minors, widows with life interest and persons legally incapable suffer a great deal on account of want of legislation on the point. Big estates are simply ruined. The Guardians and Wards Act or the

Court of Wards Act do not give sufficient relief in this respect, as the former simply appoints a guardian who seldom troubles to keep proper accounts or to care for minors, and the latter provides for big estates, and there, too, it does not improve the conditions of the estate but simply keeps a strict eye over the realised amount.

QUESTION 8.—IRRIGATION.—(a) I consider that the time has come when Government should introduce schemes of irrigation from wells by charging water or occupier's rate just as they are doing in the case of canals. In the whole of the United Provinces, it has been proved that the introduction of tube-wells is a practical proposition and water can be economically lifted for irrigation purposes by this method, but the main difficulty lies in the fact that owners or cultivators cannot afford to sink big sums of money in these installations, and even those who are in a position to have *taccavi* loans from Government are shy of putting in pumping plants, as they are afraid of the mechanic, and do not know the use of machinery themselves. I propose that electricity be generated from all canal falls and a central station be used to work up a number of small tube-wells. There is thus every possibility of protecting the area from drought. The Government may charge for the energy supplied to the cultivator. I would suggest that energy be supplied at a higher rate than it actually costs to Government. The profit should be used in reducing the amount invested in sinking the tube-well and the motor, so that after some time the pump and the tube-well may become the property of the cultivator, and the price of energy supplied can then be reduced.

I have found small 4-inch tube-wells more within the power of the cultivator and the zamindar than the bigger tube-wells.

The Department of Agriculture should encourage such small plants and an attempt be made to reduce the cost of working them. Generally these small plants are worked by kerosene oil-engines. If an efficient and simple crude oil-engine be advocated, I am sure that the cost of working these plants would be considerably reduced.

Another point to which I wish to draw the attention of the Commission is that there is too much centralisation in the Department of Agriculture. If Agricultural Engineers be allowed free scope in quoting the cost of installation and supplying different things necessary to the cultivator, the system would be very popular. The greatest handicap now is that it takes a very long time to decide how much a certain installation would cost, and even then strainers and other articles take a very long time in coming from the department, and till they arrive the whole staff has to sit idle. The whole thing has sometimes to be held over for months and thus the cultivator is very much discouraged.

In the Meerut division, there are a number of very good canal falls and the whole energy is wasted. The cultivators and zamindars know the benefits of good irrigation very well, and they would be perfectly willing to help the Government in any scheme they wanted to launch.

If water facilities were sufficiently increased, all the culturable area would be protected from famine, and then there would be every likelihood of introducing agricultural improvements. It would do a great deal towards avoiding the chances of famine in the country. I propose that the Provincial Famine Fund in all the Provinces be utilised for providing these water facilities. It would be a very legitimate charge on this fund.

(b) I am not satisfied with existing methods of distributing canal water to cultivators. The Government has decided to run canal on the off-and-on system. They are alternately closed and opened. In the hot season, especially in the sugar-cane area, fields on account of this system cannot get water for a whole month. Generally the whole crop is parched up during this period. It is only in very fortunate places that a good crop of sugar-cane can be saved from drought in the summer season.

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The result is that the cultivator is either forced to use well water where a well exists or to grow only those varieties which are drought resisting and whose yield is naturally very poor. The other defect that becomes rampant in such an area is that a much larger quantity of water has to be applied, so that water may not be required for a long time. The soil, on account of heavy watering, is packed up, the pores of the soil are filled in and the tilth is affected. I have read a number of articles and objections by the educated public and the Canal Department that the cultivator should not apply more water than is required, but the real remedy of giving water at the proper time is never suggested. It seems to be quite necessary that canals should be run continuously just as is done in Punjab and other places, so that the cultivator may be quite sure of getting water when it is required. He will not apply more water than is necessary. At times when there is less water in the river itself, distributaries might be stopped in turn for a week or so. The second objection is that canals are opened very late, and, whenever the rains stop early the crop suffers very badly. Every attempt should be made to arrange for opening the canals just after the stoppage of the rains. The third cause of dissatisfaction is that distributaries are never properly cleaned. The contract is given to big contractors who give it to sub-contractors. They clean distributaries for a few miles in the beginning. When they are convinced that nobody measures the area up to the tail, they leave it in the middle or clear the silt to a very small depth. If supervision of the cleaning be left in the hands of village *panchayats* things might improve, or supervision might be left in charge of very strict officers. The fourth cause of dissatisfaction is that the discharge of distributaries at different places is not rightly reported. Patrols do not do their duty. They measure the discharge rightly at the mouth of a distributary, and they calculate what the discharge at different places should be and report accordingly. When there is a rush for canal water, the channels are cleaned much deeper and the water taken through these channels is much more in volume than it generally is. The result is that outlets beyond a few miles from the distributary suffer considerably. There is no method by which only a certain amount of water can pass through these outlets. If the discharge is rightly given, officers can very well know what should be the proper discharge at the mouth of a certain distributary, and they would naturally arrange accordingly. Cultivators go on petitioning the officers in charge, and their petitions are dismissed without a moment's consideration, on the assumption that the discharges given by the patrol are correct. It is necessary, therefore, that some very reliable officers be put on special duty in those days to check reports of patrols by surprise. Whenever any report is found to be wrong, the patrol concerned should be very severely dealt with. There should also be an arrangement to publish the daily discharge in villages round the places where discharge is reported, so that the villagers may be in a position to know contents of the report. Fifthly, the area over an outlet is much more than it can irrigate. There are causes to which it is due. The first cause is that at the time of settlement the canal authorities are never consulted, and every area which has got water at the time of settlement or a few years before is considered to be *nahri*; it is so entered in the settlement and Revenue Department. The cultivator naturally demands water for this area, while the canal authorities never include it in their commanded area. The result is that at every settlement the area irrigable by canal is increased without increasing the amount of water in the distributary. The second cause for increasing this area is that everybody wants to take water from the canal. Whenever water is available, the cultivator can irrigate a field which was never irrigated before. If this state of affairs continues a few years,

the cultivator claims a right for canal water and the canal authorities naturally accede to the claim. The third cause is that when canal distributaries were designed, the agriculture was not done on such an intensive basis as is the case to-day and naturally the demand for water has gone much higher.

No methods have so far been employed to prevent the wastage of water by evaporation and by absorption.

At the tail end the cultivator does not suffer on account of the outlet, but he suffers on account of improper cleaning of the distributary and the expenditure of more water at the mouth of the distributary. At present a cultivator can, by digging the channel deeper than it ought to be, make the outlet discharge a larger quantity of water and this is the cause of decreasing the quantity which ought to have reached the tail end. The outlets should be so designed as to make this device ineffective.

QUESTION 9.—SOILS.—(a) (i) Yes. The *khadar* land requires special attention. In that area more nutritious grasses should be cultivated, so that grasses might be turned into hay and exported. Afforestation and levelling is also necessary at certain places. In years when there is less rain, this land can be made to yield very heavy crops, provided the question of the keeping of beasts be properly dealt with.

There are only a few places near rivers in Meerut district where good drainage will improve the soil, but proper drainage will considerably improve the health of the people.

(ii) No methodical and scientific attempt has been made to reclaim the *usar* area so far. The alkali problem of India seems to be far easier than the problem of other countries. In some cases, the mere construction of boundary walls would be sufficient to reclaim such areas, because the rain water collected within the boundaries would take the alkali to a sufficiently low level, and the land would begin to yield a good crop after good cultivation. In places where alkali is found in greater quantity, the planting of *kikar* and plum trees has been found to be useful, because the shade of trees prevents alkali from coming up to the surface. There are very big alkali tracts in the Meerut, Muzaffarnagar and Bulandshahr districts. If Government purchase this area from zamindars and try to reclaim it and then sell it over again to zamindars, it will prove a very beneficial undertaking, but perhaps the cost of reclamation might be very high. If a sort of Improvement Trust were created, it might be very useful. The other method that I would suggest for reclamation is to lease out this area to private people or companies for reclamation purposes, with this provision that the lessee would be authorised to use any method of reclamation which he might think proper together with the right of cutting and planting trees. In some instances there is a bed of *kankar* below the alkali crust, and it would be possible to reclaim by digging out the *kankar*. Also, at some places, scraping of alkaline earth will have to be done and trees planted at different places.

(iii) The prevention of the erosion of the surface soil by flood water is possible by planting trees in rows at different places and also by putting proper small *bunds* at different places. The height of the *bunds* should be gradually increased, so that water may not cut them down and so that silt may be easily deposited. If properly worked up, areas which are being washed every year by water can be very easily protected and the cost of protection will be very well paid from the trees planted. This will not be possible unless the work is done systematically and in right earnest. It seems beyond the power of ordinary zamindars to do it, unless there is a class of workers who understand these things and who are willing to work up the schemes.

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(b) (ii) In village Nan, pargana Hapur, Meerut district, there run brooklets carrying ordinary rain water, with very broad *patris* on both banks. Zamindars, to whom these *patris* belonged, gave this land for cultivation. The result was that the *patris* were turned into fields and the condition of the place changed. The result after a few years was that the area all round was washed off by the rains. Thus a very large area of culturable land was turned into waste land.

(c) The Government should give sufficient encouragement to those who want to improve these lands by giving financial help and expert advice. The revenue on these lands should be remitted for a number of years so that the persons reclaiming them might be able to recover the cost of reclamation. Such lands belonging to the Government or to the Court of Wards should be given on lease for reclamation. For ten years no rent should be taken, and after that the amount of rent should be commensurate to the income derived from this area.

QUESTION 10.—FERTILISERS.—(a) Yes, provided facilities be increased. No fertiliser is of any value in a place where water facilities are not available. Where water facilities are available, people should be encouraged to use fertilisers. The manure to which the Government's attention should be drawn immediately is bone manure. Bones are being exported every day and the Indian soil is suffering loss in phosphates. I would suggest that the export of bones should be prohibited by law. Small factories in every district should be put up to prepare bone meal. The Government should purchase large quantities of bone meal from these factories and distribute it in cities and villages for valuable crops like sugar-cane and potatoes. Distribution should be restricted to a small area only, in the beginning. When people are convinced of the utility of this manure, steps should be taken to extend the field of activities to other places. Green manure is the second thing to which attention should be paid. In order that this manure might be used on an extensive scale, it would be necessary to reduce the canal rates on these crops.

As to scientific or artificial manures, the first thing to which attention should be given is potassium nitrate. Sufficient areas are available in every district of the Province which are rich in this substance and it would not be difficult to collect it for manuring purposes at small cost. It is also possible to increase its supply by artificial means by cultivating the bacteria which turn common earth into potassium nitrate.

There is a very good field for *nim* cake to be used as manure. I have found no better remedy for white ants than the use of this manure. If, for two or three years, the Government were to purchase *nim* cake in very large quantities and distribute it amongst the cultivators of sugar-cane at cheap rates, I am sure an incentive would be created to manufacture *nim* cake. *Nim* fruit generally goes to waste and only a small quantity is collected now. I cannot recommend sodium nitrate as a manure inasmuch as it will increase the amount of sodium in the soil and ultimately would do more harm than good.

Sulphate of ammonia may have a very good chance of success provided it is available at a sufficiently low price. The Government can help the industry by lowering freight charges for sulphate of ammonia and by devising means to manufacture sulphuric acid at a low cost, so that the cost price of ammonia may be brought down.

Artificial manures for ordinary crops cannot be used by the Indian farmer, because in the first instance they are rather dear and, secondly, he has not the requisite technical knowledge to use them with profit.

(b) The prevention of fraudulent adulteration of fertilisers is possible by making the adulteration a penal offence and by appointing Inspectors to see that fertilisers sold contain the percentage of the different ingredients as advertised.

(c) The best method of popularising any new manure is to distribute the manure freely in a locality and supervise its use for a number of years. The field of activity should be restricted till people are convinced of the utility of the new manure. When people of a certain locality are fully convinced of the utility of a certain manure, the practice will spread very soon in the vicinity. But, before advocating a new fertiliser, it would be necessary to thoroughly study its effects on the texture and the physical properties of the soil. The Indian cultivator has survived so long in spite of his ignorance and illiteracy simply because he has taken pretty good care to keep his soil in the proper physical condition.

(d) There has recently been an increase in the use of oil-cake manures in the Province. The price of oil-cake on account of its demand for manurial purpose has gone up considerably, and people are prepared to offer the same price for even those kinds of cakes which are not used for feeding cattle as for the kinds of cakes used for the latter purpose.

The use of bone meal is coming to the front for potato growing, and if the bone meal be properly handled and properly advertised it will find a ready sale after a few years.

(e) No. The spasmodic attempts at applying a small quantity of these manures at the farms do not serve a useful purpose. A scientific study of the soil and manures is necessary. Not only should the question of yield be the deciding factor in the investigation of artificial manures, but the texture of the soil and the chemical effect on the physical condition of the soil, and also the physical properties ingrained in the produce, should be investigated. I am a believer in the idea that by a difference in cultivation and manuring, the quality of the produce is affected, and it also affects on the human frame. The Hindu *sastras* go still further; they believe in the effect of the difference in the quality of manures on the mental condition of the people.

(f) There is only one method by which you can discourage the practice of using cow-dung cakes as fuel, and it is by providing some cheap fuel to the cultivator. Unless this is done, there is no possibility of dissuading the people from using it as fuel. As I have suggested elsewhere, we should make necessary amendments in the law of the Province, by which tenants may also be allowed to grow and cut trees on their holdings. It is also necessary that every waste land should be utilised for growing fuel trees.

QUESTION 11.—CROPS.—(a) (i) An improvement of existing crops cannot be made by resorting to new varieties of seeds. The introduction of new varieties might have been of some use provided the Government experts had been fair in advertising their merits and demerits, but as long as every new seed has to be praised and no demerits are disclosed, the case seems to be hopeless. The cultivator should always be given to understand in what fields and under what circumstances a new variety will succeed.

I have more faith in improving the crops by seed selection on the right lines rather than taking to new seeds obtained by breeding. The cultivator has forgotten how to do seed selection in his field, and no attempt has been made to teach him the lines and the principles on which he should do it. There is a number of varieties of local seeds grown in every locality and they have developed natural potentialities for that climate and soil. It is not a wise step to discard those varieties altogether. For example, Muzaffarnagar wheat is very well known throughout the country, and I know of a time when it was purchased by the department for seed purposes. No attempt during those days or now has been made to improve that seed by selection. It has been condemned without making an attempt to improve it. Other instances of other varieties of seeds can also be quoted. Besides this, no investigation as to which root system is adopted to the soil of a particular locality seems to have been made, and new varieties are recom-

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mended without taking into consideration the adaptability of their root systems to the soil concerned.

The cultivator has no information as to which variety is in demand in the market. If the market requires a certain variety, the cultivator should be apprised of that fact. Whenever Government experts decide that a certain variety is needed for the market, they should also arrange for the purchase of this produce at an attractive price from the cultivator. Nobody is attracted by the idea of growing a new crop unless he thinks that it will be sold at a somewhat higher price than he is getting from the ordinary variety.

(ii) I have already touched upon the question of introduction of new varieties above. Sorghum and lucerne crops give the highest yield and the cultivators are thoroughly satisfied with them. No new fodder crop should be introduced unless and until the department is thoroughly convinced that it would give a better yield than the above at the same cost and at the same amount of labour, and that it would agree with the soil and other conditions as the above crops.

(iii) The present method of keeping seed stores by the Government and selling seeds to the cultivator is very costly. Even if the Government decide that seed stores are to be opened by them in different localities, I consider it necessary that seed stores should be handed over for management to private people. The cost of management under the Government will naturally be very high and, besides, the cultivator will not have the same facilities for purchasing as he would have under private management. I propose that whatever seeds the Government want to distribute should be left with a private person or a private company with the guarantee that the pure seed, as supplied by Government, will be supplied to the cultivator at the rates prescribed by the Government. The seed distributor may also be authorised to sell his own seed to the cultivator along with the Government seed provided that it is of the required standard. If this method is resorted to, the result would be that a number of private persons will be interested in the sale of seeds and people will be trained in this business. The cultivator will be able to have seed on credit whenever he cannot afford to pay in cash.

Distribution through the Government stores is not enough. Propaganda should go on and the cultivator should be taught the method of selecting and keeping his own seed. The agency of people who carry on the business of supplying seed should also be utilised.

In order to popularise a new variety, the Government should distribute seed freely to big cultivators so that they may be convinced of the utility of that variety, and if they are satisfied they will naturally take up the cause of that variety.

QUESTION 12.—CULTIVATION.—(i) The existing system of tillage can be very much improved by providing means for dry cultivation. In the months of March to June, the land remains fallow and uncultivated and the same is the case of land in which a *rabi* crop is not grown in the winter season. If the fields be ploughed up in these days, the weather will have a sufficient effect on the soil and its productive power will be very much increased. In order to do this, light disc ploughs should be employed.

Fields are not well prepared for the *rabi* crops when the rains stop early. The wooden roller employed to crush the clods is very inefficient. The use of cultipackers and Glasgow rollers should be adopted. The present length of these machines does not afford sufficient room for four bullocks to draw them. This defect can, however, be easily removed and should be removed.

For the preparation of fields for the *rabi* crop and for sugar-cane, I would recommend the use of iron ploughs which go about 6 inches deep to supplement the Indian plough. But they should only be used in fields at a time

when they are free from weeds especially of the *dub* grass. The Hindustan plough and plough No. 12 are especially useful in this respect.

(ii) As far as *kharif* crops are concerned, we should not try to introduce any new mixtures. The *kharif* crop is a very uncertain crop in the Province, and therefore the cultivator has to use at least two different crops mixed together in a field so that, if one is affected by excess rain or the want of rain, the other may perhaps survive. The system is very economical. In places where cotton is the main crop, I do not like the idea of putting in other crops along with it. Only *bindi* should be grown in a few rows in a field, as it gives vegetables to the cultivator and also provides him with a good defecant for sugar-cane juice. The plant is also necessary in a cotton field, as insects which would have affected adversely, the cotton plant would attack the *bindi* plant first and thus it wards off the injurious insects from the plant. When the harvest of cotton is practically over, we can put in *maithi* or chillies in the cotton field, or we may grow some catch crop for green manure. As to the rotation of different crops in the Meerut division, the best rotation found useful is as follows: Sugar-cane first year, wheat second year, *juar* third year and gram or peas fourth year, and this has been found by experience to be the best for sugar-cane. For a three years rotation I would suggest sugar-cane first year, wheat second year and *savi uid* or *neel* (indigo) third year. For a two years rotation for sugar-cane, I would suggest sugar-cane, vegetables, *kharbuza*, *kakri*, etc., and *sann* or indigo for green manure.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(i) In this Province there seems to be no arrangement worth the name for protection of crops from infection, pests and diseases. It is however fortunate that this danger is not widespread. But it is feared that the introduction of new varieties of seeds and seed-canes will bring in its train new pests and diseases and some preventive or curative methods and medicines will have to be devised. The history of new plants should be available for the public and they should be warned beforehand to what diseases the new variety is liable and what are the true remedies for them. An investigation into the existing diseases and pests is also necessary. The most important question is to avoid the injurious effect of white ants. So far no remedy has been found to be effective. The methods suggested by the department have not been found to be useful. In new sugar-cane varieties such as S.39 and S.48, the plants dry up themselves before the harvesting season and after the rains. Thus the whole field is affected. Similarly, the Coimbatore varieties of canes are exhibiting new diseases and their leaves are affected in different ways.

(ii) No internal measures seem necessary so far as the old crops are concerned, as they have become thoroughly acclimatised and are immune to ordinary pests, but for new varieties, as suggested above, some internal measures against infection would be necessary.

QUESTION 14.—IMPLEMENTS.—(a) The introduction of lifts worked by bullocks or by mechanical power is quite essential for canal channels. In places where lift area is very high, the canal channels cannot be utilised in the night time as labour at night is not generally available. No device for lifting water from wells has yet been devised which could replace the Indian system of lifting water by *charas*. Pumps and water lifts can be used for lifting water from wells which have got a sufficient quantity of water but the cost of the plant and of its working is so high that it is beyond the means of the Indian cultivator.

The introduction of power crushing machines for sugar-cane is a great desideratum as the introduction of these mills will give much needed relief to bullocks and their power will remain in reserve for ploughing in the winter season. Ploughs and cultivators should be introduced but before

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their introduction it is necessary to study very well the conditions of the soil and other circumstances. The introduction of a disc plough would be useful for fallow land and also for ploughing in the green manure.

Chaff-cutters worked by hand or by bullocks should be introduced as labour-saving machines.

(b) Convince the cultivator of the utility of the improved implements and bring down their prices so that they may be within the easy reach of the cultivator; then no other inducement will be necessary for making him adopt the improved implements. The department should give free scope for competition among the manufacturers of implements and should not bestow its favour on particular manufacturers. But Indian manufacturers should be encouraged. Costly machines and implements should be given to the cultivator on hire by the department, or they should be supplied to the cultivators through co-operative banks or by the hire purchase system.

(c) Yes. Freight charges are the first difficulty. Insurance at higher rates by the railway is another handicap. The want of scope for fair competition amongst manufacturers is another difficulty.

I would suggest that the Railway Board be asked to provide for cheap freight charges and the Government should introduce a cheap system of insurance for implements. Manufacturers should be given a fair chance of competition amongst themselves. The Government should ask for tenders from all manufacturers (Indian or foreign) for a machine of a certain design and should purchase machines or implements ordinarily from the firms which give the lowest tenders. This should specially be the case for those implements or machines which are designed by the department.

QUESTION 15.—VETERINARY.—(a) The control should be under the Director of Agriculture. The department is not so fully developed as to require a costly arrangement of creating a new department.

(b) (i) Yes. The system works well but it would work better if the Veterinary Sub-assistant Surgeons were entirely under the control of the Board and not under that of the Veterinary Department as they are at present.

(ii) Expansion is highly necessary. Dispensaries are not of much use to the village people as poor cultivators cannot take their cattle to the hospital nor can they keep them at the hospital; every day bringing and taking them away is a great strain on a diseased animal. I would suggest that for ordinary diseases there should be ready-made medicines available, with directions to be freely distributed amongst the villagers. A free distribution of such medicines will be highly useful.

(ii) All incumbents of the department should be provincial but Sub-Assistant Surgeons should be under the control of District Boards as I have already suggested above.

(c) (i) No. If hospitals be under the full control of District Boards the village people will avail themselves of them. There should be special rules for Sub-Assistant Surgeons to attend the diseased cattle in the villages.

(ii) Touring dispensaries are of no good. They should be stopped. It is only in the case of contagious diseases that touring dispensaries can be of any use.

(d) The illiteracy of people is the greatest handicap in creating confidence in the doctor. I do not consider any legislation is necessary. If people are forced to adopt a certain measure, I am afraid that subordinates will make money out of it. Education is the best thing to popularise the system advocated. If big zamindars and cultivators be convinced and they take up to a certain system of treating a certain disease, then naturally other cultivators will be willing to follow them.

(e) Yes. Sometimes the serum is not available. I have myself once experienced this difficulty, when I was the Chairman of the District Board. With great difficulty people were prevailed upon to have their cattle inoculated, but, unfortunately, the serum could not be received in time.

(f) No fee is charged. The only obstacle is that the cultivator is very poor and he is afraid that if inoculation affects his cattle adversely he will be ruined.

(g) No; not until the time when the villager makes good use of the existing facilities.

(h) (i) Not at this stage. Even if it is decided to conduct the investigation I would suggest that the investigation should be made by provincial authorities. If a specialist is required, a temporary man might be employed under the control of Provincial Director. The Director or any expert might be put on special duty.

(ii) No.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) The question of improving the breeds of live stock is not easy. No particular breed can be expected to thrive throughout the Provinces, which contain areas widely differing in climate and the rations available. What seems to me to be possible under the present circumstances is that systematic efforts should be made to improve the existing breeds rather than to import new breeds. This can be done by selecting the very best bulls from amongst the existing calves for procreation purposes and mating them with the best cows available and by preventing bulls of inferior type from covering the cows. Good cows are not at all available in this Province.

(ii) The well-known Kosy breed is practically extinct. The imported cows from Hissar and Rohatak do not thrive and they generally fail to give sufficient milk during their next lactation period. There is no likelihood of any improvement unless the question of breed is properly investigated. The dairyman gets practically his whole supply of milk from buffaloes.

To my mind there is something wrong with the ration given to the cows. If proper investigation were made on this point, the difficulty might be overcome.

The main defect in the present system of dairying is that calves are starved altogether and there is no system of providing the calf with better nutritive food. The second defect is that cows and buffaloes remain in milk for a very short period and during the time they are dry proper care is not taken in regard to their feeding and housing. The dairyman is so poor that he cannot afford to look after the animal properly when it is dry. An attempt should be made to increase the lactation period of the milch cow and to suggest cheap rations for the period when the cattle is dry.

I would suggest that good cows and buffaloes of the best breeds should be distributed amongst the cultivators and their price should be realised by instalments. The cultivator should be given instructions as to the upkeep of these animals.

(iii) The existing practice can be improved by (1) arrangement for better housing of the cattle in the cities, (2) distributing good cows, buffaloes and bulls amongst the cultivators, (3) investigating the best and the cheapest rations for the cattle, (4) providing facilities for the sale of milk and its products, (5) enacting penal laws against the adulteration of milk and butter so that the dairyman may get a proper price for the genuine article, (6) stopping the importation of substitutes for *ghi* and prohibiting the name of *ghi* being used in any form in their advertisements.

(b) (1) (ii) There are no pastures besides the *khadar* area in this district. It is practically the same all over the Province, where almost the whole area is taken up by cultivation. It does not seem to be economical to

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convert culturable land into pastures. There is a possibility of making people interested in growing fruit and timber trees in places where fruit and timber growing is profitable and using the land under the trees as pasture. Besides this the *khadar* area can be made to grow better grass, or can be used for pasture. Generally the Ganges *khadar* land is not producing good fodder grasses, and a special investigation is necessary in this respect. Absence of enclosed pastures does not, in my opinion, cause injury to cattle in this district.

(iii) The deficiency can be made good by importing such fodder from areas where it is abundant, but this can only be possible if the railway freight rates are reduced and communication facilities are provided.

(iv) In the dry season it is only the lucerne grass that can be available, but it requires profuse watering before it can give a sufficient number of cuttings. *Moth* and *mung* are other crops that are cultivated in places where canal water is available. If, in such areas, the water rates for green fodder were reduced, people would put more area under these crops and the difficulty would be appreciably reduced. In other places green fodder can be available only when water facilities are provided.

(v) No scientific investigation has been made by which it can be pronounced that any particular mineral constituent is necessary for supplementing the existing fodder and foodstuffs. Generally, only salt is at times given to the animal, and that had been found sufficient to keep the animal hale and hearty.

(c) Generally the fodder scarcity occurs in the months of November, December and January, especially when the *kharij* crop fails.

(d) (i) By introducing good varieties of grasses in the *khadar* areas.

(2) By finding out new fodder crops for growing in the hot season.

(3) By investigating the chances of silo fodder.

(e) Landowners can take a keen interest only when they are given practical demonstration. Pamphlets and leaflets are distributed amongst them in the vernaculars of the Province.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) A good cultivator in the Meerut district works for all the twelve months, except on rainy days. Of course the women folk have sufficient leisure. In places where land is not protected by water facilities, the cultivator has to remain idle for about four months in the year. He does nothing in those days except gossiping.

(b) The first thing necessary for the encouragement of the adoption of subsidiary industries is the arrangement for the sale of articles manufactured by the people and the introduction of model factories by the Government. There are a number of industries that can be suggested. The introduction of a new industry will depend mostly on the local conditions of the place. I would suggest fruit growing, vegetable growing, and fruit and vegetable canning, manufacture of jams and jellies, etc., and vinegar manufacture, starch making, casein manufacture, as subsidiary agricultural industries. Oil-pressing, spinning, weaving and mat-making, and hosiery are other industries that can also be very easily introduced amongst the cultivators.

(c) Bee-keeping has never been tried on scientific lines. Even in Government schools and colleges it has not been tried. Poultry rearing is not liked by Hindus on religious grounds.

Fruit-growing.—People have only recently begun to take an interest in this industry as a business proposition. So far it has been considered to be a sin to charge for fruit taken from a tree, and even now in the eastern districts nobody will charge for the fruit taken from a tree growing in his field. People are now learning that fruit growing is a paying proposition and are slowly taking to it. In villages where the soil is mostly

sandy fruit growing is very profitable and people should be induced to adopt it. *Siri*, *pesti* and lac culture is against the religious ideas of the Hindus and they are not taken up in this Province on business lines.

Rope and basket-making.—I do not consider there is much profit in either of these industries and whether there is a demand for them in the country and the cultivators consider it below their dignity to take to these industries.

(d) As far as this Province goes, the Government has done very little to help these industries. Oil-pressing is a very paying job and the Government should introduce small machines that can be worked in a village to replace the antiquated wooden mill now in use. I am not in favour of big machines being introduced at central places. Oil-cakes received from these central machines have very little food value.

Sugar making.—The industry is going to ruin day by day and no serious attempt has so far been made to improve it. The Sugar Commission Report was awaited with impatience by the public but no practical result has come out of it as yet, nor is there any likelihood that any practical step will be taken in the near future. Competition is becoming harder and harder every day and a serious attempt to save the industry both by the Government and the people is necessary. I am not one of those who consider that India is out of the sugar-cane zone and that it is not a practical proposition to save the industry. I rather believe that India is very well suited for this industry. A country which matures cane in nine months only, and where the tonnage of cane and the contents of sucrose is sufficiently large can, by proper arrangement and by providing better facilities for manure and irrigation, very well compete with the best equipped and the greatest sugar producing country in the world. Sugar-cane growing is going on mostly on account of *gur* manufacture. If the Government is really keen to improve this industry, the introduction of new Coimbatore varieties will not be its solution, unless provision is made for better irrigation and manure facilities, and unless countervailing duties are imposed on imported sugar.

Cotton ginning.—The news that America has been able to under-sell Indian cotton to Indian mills and is exporting cotton to this country is very appalling. If foreign countries can compete with us in selling cheap agricultural produce, then there seems to be no likelihood of economic regeneration for this country. If cotton growing had been taken up in right earnest and, instead of introducing new seed from outside, Indian seed has been developed and improved and better facilities for cotton growing had been provided, things would have been otherwise. There is no demand created for using cotton seed for felt, oil and fuel. In ginning there is the obstacle of sending it from place to place. The artificial barrier of prohibiting the growing of indigenous varieties in certain localities is not the proper solution of the cotton industry, unless the cultivator is convinced that the new variety will give him more yield than the indigenous one.

As to rice hulling, utilisation of wheat straw for cardboard, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc., nothing has been done by the Government. The Government should try to decide in what way they can help the people in the improvement of these industries.

(e) There seems to be no possibility of introducing subsidiary industries on the factory system for the time when the agricultural labour has to work at fields.

(f) Yes. The only thing that the Government has done so far is the survey of different industries in the Province and after that no practical steps have been taken to improve or encourage them. The survey does

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not deal with the technical difficulties of different industries. I consider that before Government takes any step for the improvement of these industries it is necessary that they should be taken up one by one and organised on a commercial basis. The haphazard system followed at present of advancing loans and grants to particular concerns has not been productive of good. In my opinion, much attention should be paid to the encouragement and improvement of the existing industries by bringing home the existing defects in the method of manufacture to the manufacturers, by giving technical knowledge and by supplying information about the market and the purchase of raw materials, etc. New industries might also be introduced, provided they do not require much of technical knowledge and the outlay of large capital. The Department of Industries should be better organised and financed and people who really take interest in Indian industries and who know something of the business should be employed. New graduates or men of no experience should not be put on to this work. There is no dearth of well-qualified Indians with foreign education in the country who can be employed with advantage in the department.

(g) A number of medicinal herbs were successfully cultivated during War time when medicinal articles were not available. As soon as the War ended, the cultivation was given up and the information and experience gathered was not utilised. By their introduction people will be employed in producing these herbs. If better facilities for learning different industries in schools and colleges were provided new industries might be started and might employ the rural population.

(h) It is idle to expect that village people will work in an honorary capacity. There ought to be a well-thought out plan for improving the health conditions of a given area and the plan should be worked out through the officers of the District Board. In this plan special attention should be given to the methods of storing manure and drainage. The scheme should be given a practical shape at a time when the agricultural labour is free.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) (i) Migration is possible only for a short period and therefore travelling facilities and accommodation should be provided. Permanent migration seems to be against the sentiments of the people of this Province.

(ii) The land may be acquired by the Government and given on long leases to the people who want to cultivate it at a reasonable rent, providing facilities for irrigation. Where areas are uncultivated on account of bad climate, steps should be taken to improve the health condition of those places. Better facilities of communication should also be provided. Labour is scarce at different places and it is due mainly to these factors.

(b) (1) High caste people do not like the idea of taking to the plough themselves and they are using labour where they were doing things themselves previously. People who have got something of education feel a sort of distaste for manual labour and naturally there comes a shortage of labour. (2) Labourers do not put in the same amount of work as they were doing formerly. The idea of responsibility is gradually disappearing amongst labourers. (3) The number of agricultural labourers has been reduced by the ravages of plague, influenza and malaria. (4) In villages which are situated near important cities, labourers migrate because they get more wages than the farmer can afford to pay. The first remedy I would suggest is that the zamindars should be made to realise the dignity of labour and should be induced to work themselves in the fields instead of leaving everything to be done by hired labour. Labour-saving machinery should be introduced.

(c) There are some places, in the eastern districts only, where uncultivated land is available. There the communications and health conditions have to be improved before any attempt can be successfully made to bring those lands under cultivation. The question of drafting surplus labour to such

areas is not easy of solution. Much will depend on the prospects offered to the labourers and on the rates of the grain and other commodities prevailing there. The main problem to my mind in agricultural labour is that the Indian labourer, since the time when he has come more in touch with city life, does not feel the same sense of responsibility as he used to. Ten years ago, a labourer could be left alone in the field for days and days together and he would carry out every operation as if it were his own field. But now, if one labourer is employed, another man is necessary to watch his movements and to take work from him. To my mind this seems to be the greatest drawback with regard to agricultural labour. The sense of responsibility should be developed in the labourers before we can think of any agricultural improvement. The question of high wages does not seem to solve the problem. Even at places where wages have considerably increased, the sense of responsibility is not developed. In India, if a labourer is employed on the contract system the work will be very badly finished and if employed on daily payment very little work will be done by him. Things were not so bad before as now. I consider it to be a national loss of the worst type and a remedy to remove this evil ought to be found, specially in places where the labour is scarce and agriculture is done on intensive lines.

QUESTION 19.—FORESTS.—(a) No. Generally, in forests, good grasses do not grow and consequently milch cattle do not thrive in such places. No attempt has been made to make enquiry and experiments in order to find out the grasses which could successfully be grown in forest areas. If they could be used for growing such grasses and proper facilities were given to the neighbouring villages for grazing cattle and cutting grass, a great impetus to dairy-farming and other agricultural pursuits could be easily given.

(b) There are only two ways of supplying firewood and fodder in rural areas, first by growing them in those areas and, secondly, by importing them from outside. As regards the first, places which are *bunjar* or *kallar* should be utilised for growing trees. The law as to the cutting of trees by the tenants should be changed. The law as it exists does not allow the tenants or the zamindar to cut trees from the occupancy or ex-proprietary area. The tree, according to law, belongs to the zamindar but he is not allowed to cut it. All trees that may be self-grown belong to the zamindar, and therefore the tenants try to uproot every tree that grows, as it affects the crops on the fields, and when it has grown he never cares to rear it properly. I consider that the time has come when the law should be changed and self-grown trees should belong to the tenant. He should be encouraged to grow fuel and timber trees in his fields, but it should not be considered as an improvement, so that whenever the tenant is ejected he should get nothing for the growing trees. The only precaution that seems to be necessary is that fields should not be allowed to be turned into groves.

All village tracks and *katcha* roads should be planted on both sides with trees and every person who plants those trees should be allowed to cut them, provided he plants new trees in their place.

Common land grown with fuel and timber trees should be treated as severalty in partition proceedings, so that co-sharers may be able to grow trees on the common land where they are not doing so on account of the uncertainty as to who will be the owner of those trees. As regards the second remedy, I would suggest that better roads should be made and the railway freights be reduced. The absence of good roads and the high freight charges combine to make the import of fuel and fodder very costly.

(c) Yes. Trees are the best safeguard in saving the land from flood and erosion. If schemes of afforestation be adopted, a good many places which are gullied all round will be silted up in a short time, and then they could

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be used for agricultural purposes. The erection of small *bunds* will also prevent erosion and damage by floods.

(e) Yes, in the *khadar* area, and near small rivers and brooklets.

(f) No.

QUESTION 20.—MARKETING.—(a) No. The criticism that I give below applies to the whole country generally and to the markets of the Province specially. Indian agricultural produce is notorious in the foreign countries on account of adulteration and mixing up of different grades. Sometimes adulteration is done with grades which spoil the quality of the original article. The whole blame is placed at the door of the cultivator, but I consider that he is not to blame. I would admit that the cultivator does not grade his produce properly before he sends it to the market, not because he does not know the benefit derived from grading, but because he is not paid sufficiently for the trouble involved. There are no markets in which a good article is in demand. The producer of a graded good article is always at a loss when he sends it to the market. Therefore, naturally, grading is avoided. If reliable markets are created by co-operative societies, as in America, and if the foreign market be ready to pay higher prices for graded articles, the cultivator will gladly take to it. As far as adulteration goes, he is not at all responsible for it. I have seen people in the market before they export commodities to other places putting in sand, earth and every other article that they can easily use for increasing the weight of the produce. They do it because even an article without sand, &c., has to pay *harda* charges and, even where these charges are not levied, articles containing sand, &c., are sold for a much higher value than they would have fetched if they had not contained any such adulterants. Where only sand, &c., are mixed up with the grain, it is possible to clean them; but there are other devices for wetting the grains which make them bulky and at the same time injure the quality. In the case of cotton, wetting is generally resorted to either in the market by the market people themselves, or by the dealers who purchase it from the villages and bring it to the market. This practice affects, very adversely, the staple of the cotton and makes it much weaker.

The question of producing different varieties in a field and sending them to the market separately seems to be impossible, considering the market conditions of the country. Any separate variety will not fetch a bigger price than several varieties mixed up together. It therefore becomes necessary for the cultivator to collect all sorts of different varieties of one crop into his barn and send it to the market, but if the cultivator gets a better price for different varieties graded separately, he will naturally keep them separate.

I would suggest that wetting, or in any way deteriorating the produce by methods which affect the quality of the produce, be made penal and deterrent punishments may be inflicted on those who still persist in adopting those means. Co-operative banks, which are now doing the work only of banking, should be used for purchasing and selling articles; if there is a network of such societies which take upon themselves the payment of good prices to the cultivator and of sending the unadulterated articles to foreign countries, the reputation will at once be established; but the work requires a great deal of trouble and a number of reliable men who will organise such societies. If the Government or private companies keep themselves well informed of the market conditions of foreign countries, it is likely that the cultivator might be induced to produce those varieties which are much in demand. I am against the idea of artificially forcing the cultivator not to produce certain varieties. It is uneconomical from his point of view. For instance, if a cultivator is forced to grow Egyptian or American cotton in this Province he will suffer a great deal. No doubt a small quantity of good cotton will be available at the sacrifice of the poor

man's labour. Artificial methods like this should be avoided as far as possible.

(b) The existing system of marketing and distribution is not satisfactory, as I have already said in reply to part (a) of this question. The procedure of sending the produce to the market is as follows:—

The cultivator, as soon as the crop is harvested, brings it to the market and places it at the shop of a dealer for sale. In some cases an intermediary purchaser purchases direct from the farmer and takes it to the market after adulterating it.

All such produce purchased from different people is mixed up together and adulterated with other articles in order to increase the weight and then it is sent out for export. If it is required to be sold for local consumption, it is not generally adulterated, but the dealer makes his profit by short weightment. I know there are a number of shops in every Indian market which purchase articles, say, wheat, for example, at Rs.8 a maund. They sell it at the same rate to the local consumer and make money out of it. They purchase, in the morning, wheat worth Rs.50 and make a few rupees by giving short weight and selling at the same rate at which they purchased. The article, when it is to be stored for some time, is stored in a very bad manner, which affects the quality of the article itself. Articles which are to be stored for long are stored from money advanced from banks and these *khattis* are kept as securities. Then one *khatti* passes from hand to hand by the wagering contract. Several devices are adopted in order to evade the law on the point. 90 per cent. of the cases which are brought into the civil courts for money on these contracts are of this nature. The markets are full of gambling devices and educated people are more to be blamed on this score. They provide facilities and invent devices for evading the law on the point. The creation of several new chambers in big cities is nothing else but a device for evading law on this point. The High Court rulings are very much responsible for these devices too. If the Government is really keen on stopping gambling in the markets it should put these practices down with a strong hand. In the Indian market people are not at all interested in the proper handling of commodities that come to them; they are more interested in gambling. There seems to be no possibility of improvement of any kind through these people unless they are forced to adopt honest means to earn their living. Financing is generally done by banks or by companies which purchase agricultural produce in advance.

I do not believe that there is any possibility of improving present Indian markets unless drastic steps are taken by the Government as indicated above. I like the idea of selling these articles through co-operative societies. If there be some central market in every district where from the produce can be exported to foreign countries or to the consumer, there is likelihood of improving the method. I would suggest that these co-operative societies should have no concern with banking. The system should be like this: Whenever an article is brought to the market three-fourths of the price should be given to the seller and he should be given a score-card stating the quality of the article. The entire produce got from different sellers should be graded separately and stored properly. When the market goes high, the stock should be sold. The profit so made should first go to defray the expenditure involved and then the balance of profit should be distributed amongst the cultivators, along with the price of one-fourth which has been withheld at the beginning. The percentage of amount withheld as security for risk should be further reduced; it would afford a greater inducement to the cultivator to send his produce to co-operative societies. Of course in the beginning for some two or three years, the market people would try to undersell these societies but if the Government persists and the right sort of people are employed, I am sure the whole scheme would be a success. In order to direct experiment, the Government should centralise its activities

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at a few places in the country and should set apart a decent sum for meeting the expenditure.

(d) Yes, so far there has been no attempt to supply any information to the cultivator. All reports, if any, are published in a foreign language and they are never prepared for the purpose of the cultivator; they are prepared for the purposes of political statistics. The Government should start a bureau and a weekly paper to give all this information in the vernaculars of the different Provinces. The price of this paper should be very low so that it may be within the reach of every cultivator and the bureau should give all information without payment.

QUESTION 22.—CO-OPERATION.—(a) I consider that the co-operative movement is not making any headway amongst the people and if it continues to be conducted on the lines on which it is now being conducted in this Province, it is bound to fail. I am not in favour of credit societies at all. No credit society can advance enough to the cultivator to satisfy his needs, and naturally he loses faith after a very short time in these societies. When a society is formed members are enthusiastic about it, but, as time goes on and there is a bad season, they are unable to give back their instalments, new advances are stopped and they lose every faith in the credit societies. By creating these societies the Government has taken upon themselves a task which they can never perform. Nobody can compete in this respect with the moneylender, it is idle to try to. The cultivator would recognise the attempt much better if steps were taken to increase his profit and to decrease his expenses. I am in favour of co-operative societies which will look after all his needs and, instead of giving him money on credit, will give him seed, bullocks, machines, agricultural implements and everything he needs, and find out his needs and try to supply him with all these articles at very cheap rates. They should also try to sell his produce at the highest price. To my mind this seems to be a possibility. If Denmark could put the entire dairy industry on a sound basis on these lines, why cannot the poor agricultural country of India do the same? There are honest and reliable persons but honesty and reliability are not the only things which make a department successful. Knowledge is the first thing that is required. The Government should send a number of people outside the country to those places where agricultural co-operation is in full swing, especially Germany and Denmark, and put them in charge of the co-operative movement; then things would greatly improve. Non-officials are not interested generally in the actual co-operation, because under the present system they can do very little to help the cultivator.

The law should be so amended as to include societies of the type indicated above. Then and then only non-officials will be made to take more interest in the thing and people generally will come to like these societies.

(b) I am not in favour of different societies formed for different purposes. There should be only one society which will do any business out of the list mentioned in this question.

(c) Yes, legislation will be necessary for compelling the small minority to join any useful schemes, but before any step besides the consolidation of holdings is taken up, it seems necessary that a public opinion be created amongst cultivators before legislation is enacted.

(d) No. I can speak of the Central Bank of Bhatiana and the District Bank of Meerut. Members of societies of both these banks do not know what is meant by co-operation and they have never taken a keen interest in its success. In the Bhatiana bank, which is the older bank, a number of societies have already gone into liquidation and others must follow. The District Bank, Meerut, is in no better position either, and I am afraid that the position is becoming worse every day. The real spirit of co-operation is not understood even by the workers of societies and banks, not to mention the poor, illiterate people.

QUESTION 23.—GENERAL EDUCATION.—(a) The existing system of education is neither efficient nor suited to this country. The first point to which attention is forcibly drawn is that all education worth the name is given in the foreign language and the vernaculars of the country are quite ignored. The result is that the general standard of education does not rise. Cramming, which is necessary to learn a foreign language and then to learn different sciences in the language, tells upon the health of the students. The aim of education before a student is nothing but service, and therefore he has a distaste for manual labour and for all professions requiring the same. The moral standard is not raised because the whole system of education is irreligious. Thus we find that educated people do not improve physically or morally. It is only a mental food which is provided by education, and the result naturally is that they become mere pulpit speakers rather than constructive workers. No arrangement has been made for imparting agricultural or industrial education on sound lines. As far as agricultural knowledge goes, it is considered that farming is such an easy job that it can be taken up by any person and it does not require any education at all. On the other hand, educated people consider it to be a profession fit for illiterates only. Educated people have got a bias against those who follow farming or other industrial pursuits. In the society of educated people, a clerk getting Rs.30 a month is more respected than a farmer getting Rs.200 a month or a trader earning Rs.1,000 a month. So long as an attempt is not made to give vocational training in schools and colleges, the system cannot improve. There was a possibility of some improvement if education experts were convinced that there was no harm in giving a vocational bent of mind to boys in schools and colleges, but even this is not admitted. I moved a resolution in the Intermediate Board, United Provinces, for this purpose and the Committee suggested the introduction of several subjects in high schools and colleges but, unfortunately, when the matter was considered by the Intermediate Board, it was thrown out and no action was taken on the recommendation of the Committee. It was with great difficulty that the Intermediate Board agreed to create a diploma course in agriculture equivalent to the Intermediate Examination, but it is still to be seen whether the University will allow these students to join the degree course in colleges. After a great deal of difficulty agriculture was considered to be a fit subject for experiment in vernacular middle schools, but even there the Director of Public Instruction did not agree that qualified teachers who have studied for at least two years in a special vernacular agricultural school should be allowed to work as teachers. He laid down that only trained teachers should be allowed to teach these classes after being given a training of six months only at an agricultural school. Can anybody in the world believe that a teacher will be teaching boys really something of agriculture by undergoing a training for a few months at an Agricultural School? This shows that education experts are against the idea that anything should be done for the industrial or agricultural education of the country. They always try to discourage every attempt in this line. I do not attach any bad motive, but it seems that those gentlemen have not realised the real difficulties of the inhabitants of this poor country and they want to engraft the very same ideas that prevail in foreign countries.

The Department of Agriculture seems to be very much against the idea of special agricultural schools and colleges to be handed over to the Department of Education, and, though the Government has promised several times to transfer the control to the University, nothing practical has so far been done. Every attempt is made to discourage agricultural education imparted by private agency. The history of the Agricultural Institute, Naini, and the proceedings of the Intermediate Board for the creation of an agricultural diploma course in that institution, are sufficient evidence on this point.

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(b) (i) We should start farmers' adult schools in every village, into which boys over twelve years and grown-up people should be admitted. They should be given elementary education in the vernacular and ordinary arithmetic by which they can write up their accounts and do ordinary calculations connected with the sale and purchase of their produce, the payment of rent and interest, &c. Besides this elementary education they should receive instruction in agriculture and should be asked to verify, on their own fields, the principles taught to them in the schools. Every school should be provided with a set of the implements that are considered to be best suited for the place and a free use of these implements should be allowed to students reading in those schools. The school should be either a day, half-time or a night-school, depending upon the circumstances of the locality concerned. The teachers should be those who understand farming very well and who can impart education to these students.

(ii) It has nowhere been started in the district. Sanction to start compulsory education in rural areas has recently been granted at certain places under the District Boards and the results are anxiously awaited, but I consider that the cultivator will resent the scheme of compulsory education unless it includes a vocational training in agriculture, as he is convinced that his children will become worthless for field operations after education, and as long as that idea exists, the success of compulsory education will not be conducive to the economic advancement of the people.

(iii) There are three main causes for this complaint, (1) boys have to leave and go to other villages at a very tender age, (2) parents have to spend something for higher education which they can hardly afford and at the same time they cannot use these boys for field operations. Thus they lose in both ways, (3) parents are convinced that a boy after reading becomes unfit for agricultural work and he is not sufficiently qualified by education to take up to service or any other job.

QUESTION 24.—ATTRACTING CAPITAL.—(a) The first step that seems to be necessary is that education of the right sort should be imparted to the people.

(ii) Small industries connected with agriculture should be started. Economic agricultural schemes should be proved to be beneficial by model working, just as boring operations and digging of wells, &c., done by private people. The Government should take steps to invite private people to do this work. The Government experts should give their advice free and try to encourage private agencies by giving on loan the costly machines and implements required for the purpose.

Practical steps should be taken at once to make compact areas and all facilities necessary for successful farming should be provided where a capitalist or a big zamindar wants to take to it.

(b) The only factor which in my opinion prevents owners of agricultural land from carrying out improvements is that they are not convinced of the advantages claimed for such improvements.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) Large village populations should be discouraged unless and until some proper arrangement for drainage, etc., is provided for. People should be encouraged to have a few hamlets at one place scattered all over the area so that they may be able to live on their own holdings with ease. But such hamlets will not come into existence unless effective arrangements are made by Government for the protection of the lives and property of the inhabitants.

Nobody spends a pie over rural sanitation. District Boards spend nothing over this important subject. I consider that a special duty for improving the hygienic condition of the people commensurate with their system of

living is necessary. The conditions of this country, unfortunately, are quite different from those of foreign countries. No systematic study of rural requirements has been made and people who have no information about village life and the poverty of the people are put in charge of this work. Suggestions that they make are beyond the means of the cultivator and hence they are never adopted. In the rainy season the condition of the villages is simply appalling. Railways, canals and roads have spoiled the natural system of drainage and have not provided artificial outlets for rain water. The result is that villages are flooded in the rainy season and the people have to lead a very unhealthy life. Water collects in depressions round about the villages, affording an excellent breeding ground for mosquitoes and providing facilities for the malarial scourge. I consider that the Canal Department is responsible for the bad drainage and they should make a survey of the entire Province and should try to improve the drainage of the country. The drains that are constructed by the Canal Department are not cleaned and never looked after even when they are asked to do so.

There are no good books on the subject and the few books that are approved by the department are quite worthless. They are written by people who know nothing about village life. The methods suggested are simply useless. The language used in writing these books is beyond the understanding of the common villager.

QUESTION 26.—STATISTICS.—(a) (ii) The system of estimating the yield is very defective. The *patwari* finds no time to do this work nor does he take interest in it, as he gets nothing for it. The whole system is simply a farce and no reliance can be placed on the figures supplied by the *patwaris*. I have seen big mistakes creep into the reports of very responsible commissions, based on figures supplied by the *patwari*. The same remark applies to (iii).

(v) The publication of agricultural statistics should be done in the vernaculars of the Province and should give necessary information to the cultivator and the lines upon which he can improve. The system of drawing inferences from these statistics is left to the very busy people in other walks of life. Experts should be employed for preparing these reports, so that they may contain information necessary to the cultivator.

I consider that that task should either be entrusted to school teachers or to the departmental people and the former, if employed on this work, should be remunerated. A check of the statistics gathered should be made either by the departmental people or by other Government officials.

Oral Evidence.

39,628. *The Chairman*: Chaudhury Mukhtar Singh, you are a pleader of Meerut?—Yes.

39,629. You have favoured us with a note of the evidence that you wish to give. Have you any additions or correction which you would wish to make at this stage?—No. I wanted to send a note on special research work that ought to be made, and I may be allowed to send it as an answer to the first question.

39,630. If you wish to send in a supplementary note, you will, perhaps, make it as short as you can in view of the length of your note?—Yes, I shall be very brief.

39,631. I see from the leading page of your note that you suggest that there is an absence of the spirit of initiative amongst students who have passed through the agricultural colleges, and their disinclination to embark upon agriculture as a profession suggests that there is some deficiency in the curriculum or system in the Provinces. Do you think it is the

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absence of sufficient practical training?—Yes, sufficient practical training, and, also, there is this defect, that the boys have no self-confidence.

39,632. If the absence of self-confidence is inherent, obviously, the agricultural college can do nothing to supply the want, but if it is due to some fault in the curriculum or system, that is quite another matter, is it not?—The curriculum also should be improved and it ought to be made more practical.

39,633. Then you suggest, on page 664 of your note, that agricultural education should be in the hands of the University?—Yes.

39,634. And you know the geographical dispositions of these institutions in the Provinces. Would you suggest that the University at this moment should take over the Cawnpore Agricultural College?—Yes, the Allahabad University should take it over. That was also proposed by the United Provinces Board of Agriculture, and it was approved by the Legislative Council.

39,635. *Dr. Hyder*: That has become a teaching and residential University?—In that case it might be attached to the Agra University.

39,636. *The Chairman*: When affiliation between these two institutions is established to the extent of the University granting a degree, would your views be met, or do you desire that the actual administrative responsibility should rest with the University?—I think that both are necessary.

39,637. On page 664, you suggest that farms should be attached to every school and that teachers would have to be specially trained in agriculture. Where do you suggest that the training should take place? In the Bulandshahr School or in the Cawnpore Agricultural College? Would that not be expensive?—I do not think that it will be expensive, as no extra arrangements will be necessary.

39,638. On page 665 of your note, you say, "The literature produced by the department through journals is simply third class and worthless." Do you regard yourself as an authority on technical literature in this field?—I do not call myself an authority on technical education, but, certainly, I have read something on agriculture.

39,639. On what do you found yourself when you make that somewhat sweeping assertion?—I have been reading both the vernacular journals issued by the department.

39,640. Let me take you away from the official mind for a moment and ask you whether you have ever heard of a gentleman who gave evidence before the Commission, Mr. Higginbottom, at Allahabad?—Yes, I know him very well.

39,641. Would you regard him as an unprejudiced person? Do you know his reputation in agricultural matters?—Yes.

39,642. Do you know that he told the Commission that the literature issued by Pusa stands very high, indeed, in the estimation of those qualified to judge in the United States of America?—I have not written the above statement about the publications issued by the Pusa Agricultural Institute; this only deals with the vernacular literature produced in my Province. Certainly, I regard it as such.

39,643. *Professor Gangulee*: Do you know the publications by Mr. Moreland?—I have seen only two of his books.

39,644. *Dr. Hyder*: In this particular passage you are referring to the popular journals?—Yes, and the pamphlets that are issued by the department in the vernacular.

39,645. Which are issued for the education of the peasant?—Yes.

39,646. You say these journals should be of a higher standard; is that the point?—Yes.

39,647. You are not referring to the technical publications of the Agricultural Department in the United Provinces?—No.

39,648. *The Chairman*: I think we ought to make that clear, because before that you say: "It will be surprising to know that under confidential orders the editors of agricultural journals and agricultural officials are prohibited from writing reviews on books written by private persons." What do you mean by that?—I think there is something wrong with that.

39,649. You must know what you yourself meant; what did you mean when you wrote the original?—Suppose there is a book written on agriculture by a private person who is not an official; he sends that book for review just as he would send it to any other newspaper, I think the Government paper ought to review it. They review all the books written by officials, but they will not review books written by private persons in these journals. They might condemn a book and say it is a very bad book, but certainly they ought to review it if the book is worth reviewing.

39,650. But then your complaint is that private attempts to publish such literature are bound to fail?—Yes.

39,651. Is not the natural inference that you wish the journals in question to publish such literature, not to review it?—I do not quite follow the question.

39,652. You say: "Private attempts to publish such literature are bound to fail if people are discouraged in taking up this work." Is it your suggestion that the reviews would assist the private persons to publish?—Yes, because the review will be a sort of authoritative pronouncement.

39,653. In answer to Question 11, you say you have more faith in improving the crops by the selection of seeds on the right lines than taking to the new seeds obtained by breeding. Why do you take that view?—Because it takes a very long time to form any opinion about a seed which is produced by breeding; it will take some time to ascertain whether it will suit a particular climate or a particular soil, and so on; but when we know for certain that a particular seed is doing all right, we can easily improve it by selection.

39,654. Have you studied the contribution made towards the improvement of India's wheat crop by the breeding of new varieties?—Yes, I have myself tried a good many varieties: Pusa 12, and Pusa 4.

39,655. What has been your experience?—In some fields they are very good, in some fields they are not; you cannot be sure that Pusa 12 will do well everywhere; it may fail miserably in many places.

39,656. I suppose that is true of any variety, is it not?—Yes. If I may be allowed to say so, the main demerit of Pusa varieties is that they have a very brittle connection between the ears and the stalks, they fall down very easily and you have to cut them early when they are not properly ripe.

39,657. At one point in your note you suggest that whenever Government experts decide that a certain variety is needed for the market, they should also arrange for the purchase of this produce at an attractive price from the cultivator. Those, I think, are your words?—Yes.

39,658. Do you really think that is a helpful proposal? Do you think that is within the limits of administrative and financial possibilities?—I think if the Government wrote to the firms dealing in those articles, naturally it would have its effect.

39,659. Your suggestion is that Government should arrange for the purchase of this produce at an attractive price from the cultivator?—Yes.

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39,660. Do you mean that Government itself should buy?—The Government itself may buy it for seed purpose, or the purchasers might be asked to purchase it at an attractive price, on account of the good variety and the clean-graded produce. Purchasers might be told that a certain variety has been grown at a certain place and is available there.

39,661. Do you mean that purchasers in the open market should be invited, in a polite note by Government, to give a good price? Is that the idea?—Yes.

39,662. *Sir Henry Lawrence*: You speak of roads kept up by the District Local Boards; what is the present practice? Is the District Local Board not responsible for maintaining village tracks?—No, it is not.

39,663. In whose possession are these village tracks?—The zamindars.

39,664. And the public have no right to demand the maintenance of a village track?—The public have only this right, that if a road is enclosed in such a way that the public cannot use it properly, they can apply to take action under Section 133 of the Criminal Procedure Code to the District Magistrate or the Sub-Divisional Magistrate.

39,665. Is there no public authority with power to secure the regular maintenance of these tracks?—No.

39,666. Has there been any proposal discussed in your Legislative Council to improve this position?—At the time when the District Boards Act was being discussed, the question was raised and these tracks were included in the District Board Act; I do not remember the Section, but now if the District Board so decides, it can take control of those tracks and maintain them; but before taking possession it must acquire them by paying for them.

39,667. The Boards have to acquire them from the zamindars?—Yes, and only then they can maintain them under the new Act.

39,668. What is your proposal? That these village tracks should be acquired from the zamindars compulsorily by law?—Yes.

39,669. Without payment?—With payment, of course. I do not suppose the amount will be much, because after all, they are not used for anything; they will be regarded as unculturable land, the price will be very small, and possibly in certain cases the zamindars themselves might be willing to hand them over without asking for any compensation.

39,670. *Sir Ganga Ram*: Do you know that these tracks which you call village tracks also serve the purpose of drainage channels after the rains?—At some places they do.

39,671. At most places they do, and if the District Boards tried to acquire them, how would you deal with the drainage of the village?—They will also have the channels alongside the tracks.

39,672. You mean new drainage channels could be made?—Yes, along the roads; the tracks are sufficiently wide.

39,673. Do you know that these tracks follow the contours of the ground; that is to say, they are not straight from place to place, but they follow the contours simply for the purpose of serving as drainage channels?—There are tracks, of course, which are drainage channels as well as tracks, but there are also tracks which do not serve for drainage purposes at all.

39,674. May I ask you, are you a landholder?—Yes.

39,675. You are also a vakil?—Yes.

39,676. Why did you give up landholding and take to law? Do you think farming is not paying?—My difficulty is that the land is separated, one field at a distance, say, of one mile from another, and there is no law by which I can get land all at one place. That was one difficulty;

the second difficulty is that, although even now I am keeping a farm at Meerut even in these days, I have only a very small portion of land.

39,677. Then you favour consolidation of holdings?—Certainly, but that will not solve the problem at all, because consolidation of holdings would only govern the tenancy. The farmer zamindar also ought to be given some chance to acquire the land in a compact block so that he may cultivate it.

39,678. *Sir Henry Lawrence*: How can it be given? By whom?—The Government should acquire land for the cultivator in one compact block. There is land under the Court of Wards which might be given out. A compact area might be given.

39,679. *Sir Ganga Ram*: You mean that the Government should exercise the right of compulsory acquisition?—Yes, if it cannot be arranged by any other means.

39,680. *The Chairman*: Do you mean uncultivated or uncultivable land?—Both. The uncultivable land may there become cultivable land.

39,681. *Sir Henry Lawrence*: You propose that Government should acquire land and hand it over to private persons for private cultivation?—Yes. There are big plots which are lying practically useless; they are not used by the zamindars or needed by them.

39,682. But would they consent to part with that land?—If there is a law they will; otherwise they will not. These *rehala* (alkaline) lands and *kalar* lands are useless for the zamindar; they do not bring him in any income.

39,683. But a private person would not take *kalar* land?—I think in certain places he might. I was willing to pay a very good price for 1,000 *bighas* of *kalar* land which belonged to the Court of Wards.

39,684. What did you propose to do with it?—I thought I should be able to reclaim it and make it cultivable.

39,685. *Sir Ganga Ram*: A big landlord has told us that wherever land is irrigable by wells, no canal water should be given. Do you support that view?—No, I think not, and my main point is that it is very seldom that the canal water is sufficient, and if the land is to be irrigated properly it must have a well in addition. There must be combined irrigation from wells and canals.

39,686. Do you know that in the United Provinces the difficulty of the Canal Department is that their water is only taken when there is a drought, and sometimes they may have difficulty in making any revenue? Would you in these circumstances favour the idea adopted in the Central Provinces, whereby a ten years' lease is taken by the cultivators, so that the Irrigation Department does not suffer and cultivators are sure of getting water?—I would welcome that idea, but there seems to be one difficulty. Suppose the water is not available in the canal, will the Government pay for the damage so caused?

39,687. No. The Government does not pay for the damage?—Then what would happen?

39,688. The zamindar will be sure to get water when he wants it, provided, of course, nature provides water?—I think he would be in the worse position, because if the area covered by a certain outlet is increased, the water will not be increased at the same time, and Government is not responsible for giving him water at the proper time.

39,689. They cannot supply water when there is none in the rivers?—The area under irrigation is increasing every year, but the water available is not increasing.

39,690. Do you mean full advantage is not taken of the water?—Sometimes the rains fail and sufficient water is not available in the canal.

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The Chairman: The witness means the canals are being extended at the expense of areas already irrigated.

39,691. *Sir Ganga Ram:* You say that water does not always reach the tail ends because the outlets are defective. Is that so?—Yes.

39,692. Have you complained of that to the Irrigation Department? In the Punjab the outlets are designed so that water must go to the tail ends?—I put several questions and moved resolutions when I was on the Irrigation Board. I was told that it was impossible. They say if the channels in the beginning are made deeper they would take more water than they used to.

39,693. You say in your note that Government should do something to stop evaporation and absorption. What is in your mind? How can Government stop that?—I do not say that is a possibility; I simply state that there is no method for doing it.

39,694. But what is in your mind? What method can be applied to prevent evaporation?—That is the question in the Questionnaire to which I was replying.

39,695. *Sir Thomas Middleton:* Have you been at any time a student in the Agricultural College?—No.

39,696. How have you come to take so much interest in agricultural affairs?—I belong to a community which is very famous for cultivation; I am a Jat. I have studied agriculture since the time I was reading for the Matriculation.

39,697. You read agriculture for the Matriculation?—No, but privately I read books on agriculture.

39,698. *Dr. Hyder:* Then you were on the Board of Agriculture?—Yes, and I was Chairman of the District Board at Meerut.

39,699. You gave some help to the Intermediate Education Board?—I was a nominated member of that Board, representing agriculture.

39,700. You say that you know personally a number of students who have read agriculture and who have land and are making no use of that land. What district is that in?—They are in the Muzaffarnagar and Meerut districts.

39,701. What is the area of the land these young men have got?—I think two of them own several villages.

39,702. Have they got employment in Government service?—One of these gentlemen started a farm in Meerut and had to leave it after a time and take up Government service.

39,703. He got remunerative employment?—Not very remunerative. He started, I think, at Rs.75 or Rs.100.

39,704. How much land had he?—He was the owner of some three villages.

39,705. But they were in the hands of tenants?—No, he himself has a compact area. He failed at agriculture and then had to leave.

39,706. *Sir Ganga Ram:* Because agriculture did not pay him?—I think so, otherwise he would have kept on farming.

39,707. *Sir Thomas Middleton:* On page 664, you say you have no faith in nature study or school plots because the teachers have not got sufficient training. That is your reason?—Yes. After all, the teachers have read only up to the middle vernacular final standard and they cannot be expected to take much interest.

39,708. Do you think steps might be taken to interest these teachers in the demonstration work of the Agricultural Department? Should they be taken to the demonstration farms and shown what is being done?—Some of them might take an interest in this way.

39,709. You do not think they would generally?—No, because they would consider it a burden.

39,710. From what class are these teachers drawn?—Generally Brahmins. I am speaking of those under the Meerut District Board.

39,711. Are there any men of your community who are teachers?—There are about ten or twelve.

39,712. Do they not take an interest in agriculture?—Very few of course, because they have no chance to take an interest.

39,713. You refer on page 665 to the fact that cultivators do not pay much attention to the demonstrations given on Government farms because, you say, they think that they are conducted by people who are more intelligent than themselves?—Yes, and who have more money at their disposal.

39,714. Is it the intelligence or the money that is the main factor in the cultivator's mind?—The fact is that the cultivators consider they are incapable of getting the same results because they do not possess the same resources and the same intelligence.

39,715. You express on page 667 a strong view on the question of Provincial Governments depending upon scientific experts who are under the Imperial Government. Do you think that every Provincial Government ought to have its own experts?—Yes.

39,716. Do you recognise the fact that it is sometimes very difficult to get experts, and that someone may be lent by the Imperial Government who will be of great use to a Province?—That is no argument. There are so many local points that have to be taken into consideration that it would be very difficult for Imperial officers to advise a Provincial Government.

39,717. But do you not agree that the Provincial Governments ought to try and get the best advice they can, from whatever source?—As far as theoretical matters go they might get the best advice in that way; but in practical matters there might be some difficulty because these officers would not have any local knowledge.

39,718. There is nothing to prevent an Imperial officer acquiring the local knowledge?—But it takes some time.

39,719. On page 669, you say that all village tracks should be acquired by District Boards. Would that not prove an impossible burden for a District Board, because of the cost in acquiring and maintaining village tracks?—I am still of this opinion, personally. In all the partition cases, there is a general clause in the partition proceedings that the village tracks will remain the common property of the zamindars. If at the time of partition the zamindars be asked to declare these tracks as the property of the District Board, they would be willing to do so and in that case nothing would have to be paid to any zamindar. Certain big zamindars may be perfectly willing to thus hand over the village tracks to the District Boards.

39,720. How would you raise funds to maintain these village tracks?—The funds might be raised by fresh taxation.

39,721. From the particular villages benefited?—That would be difficult, because the accounts would have to be kept separately, but the special taxation on "circumstances and property" may be levied and the money so received be utilised for the purpose.

39,722. Do you think that anything could be done to get the villagers to combine to maintain their own village tracks if there was some *panchayat* or other body in charge of the village?—It can be done, but personal interest would hamper the proposal. Suppose I am a big zamindar and the track belongs to me, and I am a member of the *panchayat*, then nobody will have the courage to ask me to leave the track land encroached upon by me. There will be favouritism all round; but if it is to be in the hands of the

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District Boards it would be much better. If the District Boards desire, they may have subordinate bodies or committees under them.

39,723. The District Board might take charge of a group of villages through the sub-committees?—Yes, or one of the members of the Board representing that group may be lent for some time to the panchayat or the Committee.

39,724. Do you not think that it would be possible to secure labour from the villagers themselves acting under a *panchayat* of their own so that the roads might be repaired at the proper season?—It will not be done. I have tried that with respect to the drainage of the villages and I have failed.

39,725. You failed because you had nothing except your personal influence?—Yes.

39,726. *Sir Henry Lawrence*: You tried to get the villagers to work to improve the channels without payment and they would not do it?—Yes; in some of the villages where I happen to have great influence they might do it. After all it is an honorary work and nobody will like to work for nothing.

39,727. *Sir Thomas Middleton*: On page 670 of your note, you refer to the very high rates charged by traders in cattle. Is the custom in your district for the cultivators to purchase most of the cattle they require or do they breed most of them?—Mostly they purchase because it does not pay to rear their own cattle.

39,728. Therefore in effect the traders in cattle in your district are moneylenders?—Yes, in effect.

39,729. Charging high rates of interest?—Yes.

39,730. On page 676, you say with regard to the improvement of crops: "I have more faith in improving the crops by the selection of seeds on the right lines rather than taking to new seeds obtained by breeding." I think it would be true to say that most people have more faith in that method. That is the common method adopted in India?—My point is this. The Department of Agriculture makes no provision for the supply of good local seeds and the cultivators mostly have to buy their seeds from the moneylender who is not at all interested in the supply of good seeds. He purchases the cheapest variety and sells it for seed purposes to the cultivator without having any regard to whether it is a good seed or not.

39,731. You also advocate that the officers of the Agricultural Department should proceed by way of selection of seed rather than by cross breeding?—Yes. Select seed of the local varieties should be kept in the seed godowns for sale by the department.

39,732. It is for that reason, I think, that you suggest that Government should purchase the seed of select varieties?—Yes; it might be done in this way. I am in favour of selecting the seed when the crop is standing in the field. The departmental man may go and select the best seed and stock it rather than purchase from the market.

39,733. What is your objection to the method of cross-breeding?—I have no objection to that method. My main point is that we do not know what the parents of the seed are. There might be some disease which might also be imposed along with the seed.

39,734. Of course all that is taken into account. I thought your objection would be that it takes a long time?—It does take a long time, too.

39,735. It is a method which is only resorted to when necessary, and therefore you must spend the time that is necessary if you want to get certain new plants?—My point is that until the method of cross-breeding becomes successful, we should go on by selection and selection seeds alone.

39,736. That is what is being done?—I do not think in the whole of the United Provinces there is a seed depot which has the local varieties of seed for sale. I know of no such depot.

39,737. *Dr. Hyder*: In speaking of fertilisers you say that the use of bonemeal should be encouraged. Do you think that the people at Bulandshahr would touch bonemeal?—Yes.

39,738. Are you satisfied on that point?—Yes.

39,739. You say that the postal rates and the charges on telegrams should be reduced. Do you think the cultivator makes any large demands upon the telegraph office?—During the harvest season there are many telegrams.

39,740. The middleman would get the advantage, but would it be for the benefit of the cultivator?—I think in the long run, ultimately, if the rates are reduced the cultivator would get the benefit.

39,741. Supposing the charges were reduced, I want to know whether the cultivator would benefit thereby?—Not directly.

39,742. Do you think that the cultivators in the United Provinces are largely in the habit of writing post cards?—Certainly.

39,743. They are very much educated?—I think there are a number of people in every village certainly who are educated; we know the percentage of literates.

39,744. What is your idea of utilising jails? Do you think the system would be popular?—I think the jail is the best place for the purpose of imparting education in improved methods of agriculture.

39,745. You do not think there would be an outcry against this system?—No, I do not think so. That was the idea of Mr. Marsh. We can make an experiment at Meerut. There are about 60 acres of land adjoining the Meerut jail. Even now the prisoners have to do gardening and growing vegetables for their own use.

39,746. With regard to the railway rates, can you give me any specific instance in which they fall heavily on the cultivator?—I know there is a firm, Kirloskar Bros., at Satara who complain of the rates.

39,747. I am talking about the transport of agricultural produce?—With regard to fodder, *bhusa* and other things, the rates are high.

39,748. Are you familiar with the tariff schedules of Indian railways?—I do not now remember them exactly, but I know that the rates are reduced when there is a famine; otherwise the rates are very high.

39,749. They are carried at special rates even now?—Not always but only when there is a famine declared.

39,750. What is the point about Kirloskar Bros.?—They are the manufacturers of agricultural implements. When these implements are sent to Meerut they have to pay very high rates. Take the instance of their cheapest plough. Its price is Rc.6-8-0 or 7-8-0 and it cost about Rs.2 or more to carry it to Meerut.

39,751. But the distance between the place of manufacture and Meerut is more than 1,000 miles?—But suppose we get the same from England, I think the charge is much less.

39,752. Are you sure on that point?—I cannot now give you the exact figures, but I am sure on this point that a plough imported from England would cost less than if it were bought from Kirloskar Bros.; I am quite sure on this point.

39,753. With regard to agricultural indebtedness you say: "The responsibility of litigation rests on *patwaris*, *kanungos* and the police and improper legislation and the rulings of higher courts." I want you to point out any

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specific defects in the law. How can this nuisance of *patwaris*, etc., be overcome?—There is the question of wrong in *patwari* papers due to corruption, and I think there are thousands of cases pending at present in the revenue courts on this account. Mostly they are all the creation of *patwaris*. I may be cultivating the land but the zamindar's name will be there. The zamindar may be cultivating the land and the tenant's name may be there.

39,754. Government has passed the legislation; how can this nuisance be coped with if it exists at all?—I think something can be done.

39,755. The Government cannot go beyond that, can they?—Government can appoint more responsible and high officers who should often go to the villages and inspect the records.

39,756. The checking is done by the *kanungo* and the Tehsildar?—It is only on a very small scale. The checking by the *kanungo* is practically of no avail.

39,757. *Sir Ganga Ram*: Is there much corruption amongst *patwaris* in your Province?—Yes, very much.

39,758. Government has increased their salaries on the ground that they were inadequate?—Yes; but corruption cannot be cured by the increase of salaries.

39,759. That is what I say; corruption cannot be stopped by the increase of salaries?—No; it can only be stopped by strict supervision and proper inspection of records.

39,760. And not by appointing men of intelligence on high salaries?—I think Government will not be able to pay handsome money to these persons.

39,761. Are your *patwaris* hereditary?—Yes, as a general rule.

39,762. They are not appointed on merit?—They have to pass the *patwari* examination.

39,763. Generally the post is hereditary?—Yes; if a man dies his son has got the preference.

39,764. *Dr. Hyder*: With regard to agricultural labour, page 683, you say: "Better facilities of communication should also be provided." When you say "travelling facilities" I suppose you mean that they should travel at reduced fares or travel free?—No; if they are taken to places like Mirzapur, for instance, which is an uncultivated area, travelling facilities must be provided for them.

39,765. Has co-operation been a success in the United Provinces? Do you think that in the United Provinces you would be able to embark upon more ambitious ventures?—I think that so far as banking goes you cannot give a tenant sufficient money to get out of the clutches of the moneylender.

37,766. You say that the rural population should be spread over their holdings and effective arrangements must be made by the Government for the protection of the lives and property of the inhabitants. Do you want to see the policing of every hamlet established?—No; the people should be encouraged to have a few hamlets at one place scattered all over the area, so that they may be able to live on their own holdings with ease; but such hamlets will not come into existence until effective arrangements as suggested by me for the protection of life and property are made by the Government. If, however, the number of villages is increased and the villages themselves are far apart, in that case naturally the police force would have to be increased.

39,767. And do you think the United Provinces would welcome such an increase and grant money freely for the Police Budget?—There is no question of granting money; it is a question which concerns the safety of lives and property of the people, and when this will be the main concern the people will be only too glad to provide money for the purpose. Every improvement as a matter of fact requires money.

39,768. *The Chairman*: Are you farming yourself at the moment?—Yes.

39,769. How many acres have you?—I have got about forty acres.

39,770. Do you manage the farm yourself?—No, my brother does.

39,771. You are jointly interested with him?—Yes, I am.

39,772. Has he any profession other than agriculture?—No, he is a more practical man than myself, because he does things with his own hands.

39,773. Does the business pay?—Yes, it does.

39,774. *Professor Gangulee*: You say that the medium of a foreign language puts a great strain on the mental faculties of the student, and therefore his health is undermined. Would you like to impart education through the medium of the vernacular?—Yes.

39,775. Up to what stage?—Up to the matriculation stage at least.

39,776. Then what would the student do in the University? Would he there begin to learn the alphabet of the English language?—My idea is to make English a secondary language, and to let the student prosecute his studies in the vernacular.

39,777. Up to the matriculation standard you will give him a vernacular education?—No, I would let him continue right up to the M.A.

39,778. Talking about the effect which manure produces on the mental condition of the people, you make a reference to the Hindu *sastras*? To which *sastras* are you referring? Do you mean to say that if a certain manure is applied it will produce a different mental effect? I want to know which *sastras* are you referring to there?—Take Manu, for instance, where you will find a good many *slokas* on the subject; and there is the Charak.

39,779. Do they say that manure affects the mental condition of the people? I thought that the mental conditions would affect manures?—It may look absurd, but that is true.

39,780. You definitely state on page 676 of your note that the Hindu *sastras* believe in the effect of the difference in the quality of manures on the mental condition of the people, and I wanted to know which particular *sastras* you were referring to?—I mean to say that if the grain that is produced by the help of different manures is eaten, that will have a different effect than would be the case if it were produced in a different manner.

39,781. *Mr. Kamat*: By the effect of nutrition, I suppose?—I think so.

39,782. *Mr. Calvert*: You are very dependant on the question of co-operative credit?—Yes.

39,783. If the co-operative movement in your part of the country had been controlled entirely by Jats, do you think it would have been more successful?—I think the results would have been more disastrous, because the Jat is not a calculative man.

39,784. The Jats on your side of the Jumna cannot run co-operative societies?—No, because they have not got calculative brains.

39,785. Why do the Jats living on the western side of the Jumna manage co-operative societies as successfully as they do, and why should not those living on the eastern side be capable of doing the same?—I have no experience of the Jats on the other side of the river. Here the people are poorer than the Punjab Jats; that might be one reason; and for another you will perhaps find very few Jats join the co-operative banks on my side of the country, because if they can get money even at 12 per cent. there is no reason why they should go and join the unlimited liability societies or banks and pay 15 per cent.

39,786. You do not believe in your fellow Jats much?—I have said that they are not calculative; they do not take care of their annas and pies. In

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the case of a co-operative credit society, one must be really calculative; a man must know how much interest would be given, where the money would be deposited, and what is the balance which is lying idle: all these details should be known to him.

39,787. There is some difference between the Jats of the Delhi Province and the Jats just across the railway bridge?—No.

39,788. The Jats here are running co-operative societies very well?—I do not know; generally there are very few Jats who have joined the societies on my side.

39,789. *Mr. Kamat*: You have said something about the planting of trees and the rights of tenants as opposed to zamindars, and I think you also said that you wanted some legislation in this respect. Would you please amplify what the difficulty is, and also let us know what is your remedy?—According to law every tree, whether fully developed or not, belongs to the zamindar.

37,790. And therefore the tenant uproots the tree?—Yes; neither the tenant nor the zamindar is allowed to cut it.

39,791. So that, as a result of this dispute between the tenant and the zamindar, no trees can be grown and the land does not improve so far as the new growth is concerned?—No.

39,792. Then what is the remedy for that?—I suggest that if a tree is reared and grown on the holding of the tenant, it must belong to the tenant who may, if he wishes to do so, cut the tree.

39,793. But if it is planted by the zamindar?—It cannot be planted by the zamindar on the holding of the tenant.

39,794. *Raja Sir Rampal Singh*: You have suggested that the Court of Wards may lease out cultivable lands to the people for the purpose of farming. Do you think that that proposal would be favoured by the wards?—Why should they object?

39,795. What right has the Court of Wards to lease out lands to certain persons in the way of giving perpetual rights?—The leases may be for seven, ten or twelve years; the whole thing depends upon the circumstances of the case.

39,796. Would anybody come forward to begin farming without first obtaining permanency rights from the Court of Wards?—Yes, the tenants would be forthcoming for less period too. There are cases of uncultivable land from which the Court of Wards is deriving no benefit, and naturally if the land is given out on a lease of 99 years, the wards will not dislike the idea, because otherwise the estate will be getting nothing from such land.

39,797. But there would be a margin for improvement after the ward had attained majority. In my own part of the country, wards will raise very great objection if the Court of Wards lease out such lands to outsiders without their consent and permission?—I doubt it very much; at any rate, it does not appear to be an impossibility. Rather it seems to be quite possible that the wards themselves might have the ambition to lease out those lands themselves directly when they attain majority.

39,798. Are you quite satisfied with the management of the Court of Wards?—I think the percentage that is charged is very high; it varies from 10 to 12 per cent.

39,799. *Sir Ganga Ram*: Do those landlords who are the sole owners of villages look to the health of the tenants in the way of giving them a good water supply or providing sanitary houses under hygienic conditions? Do they do nothing to make life worth living?—I think they are not interested in that question at all.

39,800. They are only interested in getting their rents?—Yes.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Tuesday, the 22nd February, 1927.

Tuesday, February 22nd, 1927.

DELHI.

PRESENT :

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S. (*Chairman*).

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. } (*Joint Secretaries.*)
Mr. F. W. H. SMITH }

PANDIT MADAN MOHAN MALAVIYA, Member of the
Legislative Assembly and Vice-Chancellor of the
Benares Hindu Assembly.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—Research is the highest stage of education. A consideration of it will naturally come in after the general system of agricultural education has been considered. Assuming that a good system of agricultural education has been provided for in schools and colleges, I would suggest that there should be a Faculty of Agriculture in every University, and ample facility of every kind (financial and other) should be given to such Faculties to organise and promote scientific investigation and research in consultation with each other. Scientific and industrial research, when carried on by Government departments or under the control of an administrative officer of Government cannot become as popular and fruitful of good results as it would be if it were associated with the Universities. In my opinion, even the money that has been spent at Pusa would have borne much greater fruit if the institution had been established at, and were a part of, a residential University. A University attracts the most promising youth of the country; it is the best centre for propagating ideas and creating enthusiasm for any subject among the student population. If the Professors and students of the Faculty of Agricultural Science will find themselves working at one centre in close proximity to those of other sciences, they are likely to find the atmosphere far more inspiring than in an isolated institution away from a University.

In view of the immensity of the range of agricultural problems to be investigated, we need a large supply of competent researchers. We must adopt several measures to create them and useful guidance may be found in this direction by drawing attention to some of the recommendations of the "Interim Report of the Consultative Committee on Scholarships for Higher Education," which was published by the Board of Education in England in 1916. They said:—

"The most useful thing that can be done without any increase in the means, is to encourage research in existing institutions after graduation. Given a limited amount of money available annually, the first need would be to assist existing institutions for training in science and technology, to improve their equipment, increase their staff, attract more highly-qualified teachers, and introduce new subjects of study; and to establish new places of higher technical and scientific instruction where needed. To bring existing institutions fully up to national

needs, a greater capital sum and income would be required. But any sum well expended would be useful. . . . Improved and extended higher secondary education is needed. Side by side with this, with the strengthening of Universities and technical schools and with an increasing demand for scientific workers, an increase in the supply of scholarships from secondary schools and Universities will be required. This should move *pari passu* with other improvements."

Dealing with the same subject, the Committee of the Privy Council for Scientific and Industrial Research said in their report for the year 1915:—

"If we were asked to state the conditions that appear to us necessary for the success of our work in the shortest possible terms, we should reply: first, a largely increased supply of competent researchers; secondly, a hearty spirit of co-operation among all concerned, men of science, men of business, working men, professional and scientific societies, Universities and technical colleges, Local Authorities and Government departments. And neither condition will be effective without the other.

"The responsibility for dealing with the grave situation which we anticipate, rests with the education departments of the United Kingdom. We shall be able to do something to encourage a longer period of training by the offer of research studentships and the like, but that will not suffice. It is useless to offer scholarships if competent candidates are not forthcoming, and they cannot be forthcoming in sufficient numbers until a large number of well-educated students enter the Universities. That is the problem which the education departments have to solve and on the solution of which the success of the present movement, in our opinion, largely depends. . . . All the measures mentioned above will be necessary if the result desired is to be brought about."

In this connection, I beg to point out that the Benares Hindu University can be made a particularly suitable centre for promoting agricultural research. From its very inception it has recognised the need and importance of agricultural education. In the Prospectus of the University which was published in 1911 it was stated:—

"It is proposed that the second college (the first being a college of Science and Technology) to be established should be the college of Agriculture. . . . For a country where more than two-thirds of the population depend for their subsistence on the soil, the importance of agriculture cannot be exaggerated. Even when the manufacturing industries have been largely developed, agriculture is bound to remain the greatest and the most important national industry of India. Besides, agriculture is the basic industry on which most of the other industries depend. As the great scientist, Baron Leibig, has said: 'Perfect agriculture is the foundation of all trade and industry—it is the foundation of the riches of the State.' The prosperity of India is, therefore, most closely bound up with the improvement of its agriculture. The greatest service that can be rendered to the teeming millions of this country is to make two blades of grass grow where only one grows at present. The experience of the West has shown that this result can be achieved by means of scientific agriculture," etc., etc.

The University began its work in 1917. In 1919 it had a scheme for an Agricultural College prepared by Dr. Harold Mann, the Principal of the Poona College of Agriculture, and Sir Ganga Ram, the Honorary Chief Engineer of the University, which was to cost about 10 lakhs. His Highness the Maharaja Sahib of Benares, a Patron of the University, was pleased to sanction a permanent lease of 2,100 acres of land between the University grounds and the river Ganges for the purposes of an agricultural farm. Sir Ganga Ram has promised to meet the full cost of a canal to irrigate the land, and has been pressing that its construction should not be delayed.

We have applied to the Government of the United Provinces for the acquisition of the land needed for the canal. I am grateful that the President and members of this Commission honoured the University by a visit. As the Commission would have noted, the University has built up well-equipped Departments of Physics, Chemistry, Geology, Botany, Zoology, Mechanical and Electrical Engineering, and Industrial Chemistry, and a botanical garden. Its Department of Botany is particularly well equipped for Plant Physiology. It has already got in its possession about 500 acres of land which can be used for the purposes of the college. Besides, in addition to the 2,100 acres mentioned above, there is plenty of land around which can be available for demonstration and investigation. The Council of the University believe that, situated and equipped as the University is, with its number of students growing, it is not only suited to become a great place for agricultural research, but also an important centre for demonstrating the great possibilities of scientific agriculture and for spreading a living knowledge of it in all the surrounding country, both among landholders and tenants. If this view should commend itself to the Commission, and if it should recommend that the Government should help the University with suitable recurring and non-recurring grants for the purpose, the University would gratefully co-operate with the Government to build up an important centre for promoting scientific agriculture.

QUESTION 2.—AGRICULTURAL EDUCATION.—Various Commissions and Committees have been unanimous in recommending that the edifice of agricultural education should be raised on elementary education, and, therefore, where the progress of general primary education has been so poor, it may safely be assumed that the seed of agricultural education has not yet been sown. Writing on the subject, nearly a century after Elphinstone, Mr. (now Sir James) MacKenna said:—"There is probably no subject connected with agriculture on which so much has been written as agricultural education, none, perhaps, in which less has been effected. It has been debated at numerous conferences and has been the text of many writers, but there are practically no results to show. The Famine Commissioners, so long ago as 1880, expressed the view that no general advance in the agricultural system can be expected until the rural population had been so educated as to enable them to take a practical interest in agricultural progress and reform. These views were confirmed by the Agricultural Conference of 1888. . . . The most important, and, probably, the soundest proposition laid down by the Conference was that it was most desirable to extend primary education amongst the agricultural classes. But with the enunciation of this basic principle, other resolutions were passed which, while containing much that was excellent, probably led to the extraordinary confusion of subsequent years." The same writer goes on to say:—"Any attempt to teach agriculture in India, before investigation has provided the material, is a fundamental mistake which has seriously retarded development, and this mistake has affected, not only elementary, but, to a much greater extent, collegiate education."

This is where we stand after half a century of enquiry, discussion and trial! It is instructive to recall that during the same period, Japan established an excellent system both of general elementary and agricultural education. It is fully described in Mr. H. Sharp's *Educational system of Japan** (1906). In addition to primary schools, they established agricultural institutions of three grades, elementary, secondary and advanced. "Under the first head there are 503 supplementary agricultural schools, and 49 of Class B, under the second, there are 57 schools of Class A, together with a secondary course in Soppora School, whilst for advanced instruction there are three Government institutions. The

*Vide pp. 219-238.

higher primary schools have recently been ordered to include either agriculture, commerce or manual work in their curriculum." There were 503 supplementary agricultural schools, attended by boys of the agricultural class. It is worth considering whether a similar system of elementary, secondary, and advanced agricultural institutions may not be established in every Province in India. This was in 1906. The number of these institutions must be greater now. The history of the first attempts of Japan at a scientific treatment of agriculture is also very instructive. Says Mr. Sharp:—"The Government established experimental farms, imported domestic animals, seeds and implements, and tried its hand at cattle-breeding and the like, but most of these attempts ended in failure, for want of trained men to take charge of them. The authorities then turned to the training of such men; the graduates of the agricultural college of Tokyo were set to carry out simple experiments with the help of farmers; the results of these were so satisfactory that the farmers were deeply impressed with the importance of the scientific treatment of farming; and by 1893, an Imperial Agricultural Station was firmly established. In the next three years there were added to it nine branch stations, which carried out simple experiments, and tried to establish similar stations for themselves, Government promising an annual subsidy of £15,000. The prefectures began to vie with each other in organising experimental stations. They maintained 40 experimental farms, each employing several experts. Rural districts also maintain 110 experimental stations of a similar type; and there are others again belonging to towns, villages, or associations of farmers' sons. Further, there are five local agricultural institutes . . . Much good again has been done by travelling lecturers, who stay in a place for a week or two, lecturing on soils, manures, implements, etc., and answering enquiries from the farmers of the district. They also look after experimental farming, attend to local agricultural shows, and make themselves generally useful. It is found that the farmers are willing to listen to these men, of whom there are over 300. In 1903 there were 46 prefectural agricultural societies, spending over £5,000; 561 such societies in districts or cities, and over 10,000 in towns and villages. In the preceding year Government had granted about £1,500 to the prefectural societies."

I think that if graduates are trained in adequate numbers at agricultural colleges and are similarly employed here to carry out experiments with the help of farmers, they will be able to enlist their interest in such experiments and generally in the scientific treatment of agriculture.

QUESTIONS 5 AND 6.—FINANCE AND AGRICULTURAL INDEBTEDNESS.—The main causes of borrowing are insufficiency of income, the rigidity of the land revenue demand, the demands of religion and social customs, and the want of credit facilities.

The remedy for it will be found in reducing the land revenue demand, securing the entire profit of the reduction to the tenant, in education, in co-operative societies and agricultural banks.

The late Sir William Wedderburn advocated the establishment of agricultural banks, as far back as 1882. The late Mr. Mahadeva Govind Ranade read a valuable paper on "The Reorganisation of Rural Credit in India" before the first Industrial Conference at Poona in 1891. It is a powerful plea for the establishment of agricultural banks and might yet be read with advantage. It is a matter for regret that such banks have not yet been established. They should be.

QUESTION 16.—ANIMAL HUSBANDRY.—The great importance of dairying in a country where the bulk of the people are vegetarians should be recognised. The great law-giver, Manu, has laid down that a certain amount of land should be left in every village as free pasture. I am informed that this ancient and wise rule is still followed in some parts

of the Punjab. I strongly recommend that the Government and the people should be advised to provide ample grazing land in every *tahsil* and district. This would lead to a great development of the dairying industry, and contribute in a considerable measure to strengthen the economic condition of the cultivator.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—India was noted for its manufactures up to the beginning of the last century. The decline of Indian industries, the growing imports of British manufactures and the exports of raw produce from India, led inevitably to the impoverishment of the manufacturing classes in all parts of the country and drove a growing proportion of the population to depend more and more upon the land. This led to more frequent famines. There were 24 famines between 1851 and 1900. After the disastrous famine of 1877-78, the Government appointed the Indian Famine Commission to enquire "how far it is possible for Government by its action, to diminish the severity of famines, or to place the people in a better condition for enduring them." In their Report, the Commission said:—

"A main cause of the disastrous consequences of Indian famines, and one of the greatest difficulties in the way of providing relief in an effectual shape is to be found in the fact that the great mass of the people directly depend on agriculture, and that there is no other industry from which any considerable part of the population derives its support. The failure of the usual rains thus deprives the labouring class, as a whole, not only of the ordinary supplies of food obtainable at prices within their reach, but also of the sole employment by which they can earn the means of procuring it. The complete remedy for this condition of things will be found only in the development of industries other than agriculture and independent of the fluctuations of the seasons."

The Commission made many recommendations for "the encouragement of a diversity of occupations" among the people. Among others they said:—

"Among the articles and processes to which these remarks would apply may be named the manufacture and refining of sugar; the tanning of hides; the manufacture of fabrics of cotton, wool and silk; the preparation of fibres of other sorts and tobacco; the manufactures of paper, pottery, glass, soap, oils and candles."

In 1916 the Government of India appointed an Industrial Commission on which I had the honour to serve. It made copious recommendations for the encouragement and development of industries. Departments of Industries have been established in the Provinces. But a well-organised system of Industrial Education and of organised cottage industries has yet to come. I recommend that, here again, a system of industrial schools such as has been adopted in Japan should be introduced. To start with, there should be at least one industrial school established in every district, and later on in every *tahsil*, where boys might be trained in carpentry and smithy work, so that they may be able to meet the ordinary needs of the agriculturist of the *tahsil*. There should be a museum established in every district with a view to awaken and maintain interest in industrial effort. Provision should be made in the district school for imparting instruction in hand-spinning, hand-weaving of cotton, wool and silk, tanning, shoe-making, making of paper, inks, soaps, paints, varnishes.

QUESTION 22.—CO-OPERATION.—Government deserve credit for having started and encouraged the system of co-operative credit societies. The system has been growing, but what has been done is very small compared to what needs to be done in this matter, and I cannot do better in this connection than draw the attention of the Commission to certain observations of Sir Daniel Hamilton, who was the Commerce member of Lord

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Curzon's Legislative Council. In an article reproduced in *New India* of 16th August, 1916, Sir Daniel Hamilton, writing under the heading of "India—Her Present and Her Future," wrote as follows: "One hundred and forty years ago the finger of Adam Smith pointed to the weak spot in British rule, and the finger of Sir Edward Maclagan points to the same danger spot to-day. In 1775 Adam Smith wrote: 'In Bengal money is frequently lent to farmers at 40, 50 and 60 per cent. and the succeeding crop is mortgaged for the payment . . . Such enormous usury must in its turn eat up the greater part of the profits.' In 1915 Sir Edward Maclagan wrote: 'The moneylenders' rate we have found in many places to be as much as 38, 48 and 60 per cent. per annum.' Financially, the people stand where they did at the commencement of British rule. Is it wise to leave them standing there any longer? The great industry of four-fifths of the Empire still without a banking system, 250,000,000 of people without credit or cash. The *sowcar's* reef is the rock on which India lies stranded, and until the ship of State with its huge living freight is afloat on the silver sea of credit, India will never reach the haven of peace and plenty and power. We have given the people a railway system which removes their surplus crops, but we have not yet given them a banking system to bring back the price. The world takes the surplus crops, the *sowcar* and the trader take the money, and the devil takes the people."

In another portion of the same article Sir Daniel Hamilton said: "The want of credit among the masses is, I believe, a chief cause of unemployment and unrest among the classes. Multiply credit among the masses and you multiply employment and peace for all. Credit is purchasing power, and an increase in the purchasing power of 315 millions of people will start the greatest trade boom the world has ever seen, and create employment for man and beast."

The people should be encouraged to form societies for co-operative purchase and marketing, for effecting improvements in their villages and carrying out objects of common concern, for the use of agricultural machinery, for cattle-breeding, for the crushing of bones for manure, &c.

QUESTION 23.—GENERAL EDUCATION.—The second important means of promoting the welfare of the agriculturist to which I wish to invite attention is universal, free, compulsory, primary education, and I cannot better express my ideas on this subject than in the words of Mont Stuart Elphinstone, a former Governor of Bombay, uttered in 1823, which are still true as ever:—"I can conceive no objection that can be urged to these proposals, except the greatness of the expense, to which I would oppose the magnitude of the subject. It is difficult to imagine an undertaking in which our duty, our interest, and our honour are more immediately concerned. It is now well understood that in all countries the happiness of the poor depends in a great measure on their education. It is by means of it alone that they can acquire those habits of prudence and self-respect from which all other good qualities spring. We have all often heard of the ills of early marriage and overflowing population; of the savings of a life squandered on some one occasion of festivity; of the helplessness of the ryots, which renders them a prey to moneylenders, of their indifference to good clothes or houses, which has been urged on some occasions as an argument against lowering the public demands on them; and, finally, of the vanity of all laws to protect them, when no individual can be found who has spirit enough to take advantage of those enacted in their favour; there is but one remedy for all this, which is education." Thirty-one years later the foundation of the present system of public education was laid in this country by Sir Charles Wood's famous despatch of 1854, in which the Honourable Court of Directors said that it was one of their most sacred duties to be the means, so far

as lay in them, of "conferring upon the natives of India those vast moral and material blessings which flow from the general diffusion of useful knowledge," and they directed their Government to take active measures to promote the education of the masses. The Famine Commission which reported in 1880 and the Agricultural Conference of 1888 also recommended that steps should be taken to extend primary education amongst agricultural classes. The Education Commission appointed by the Government of India recommended in 1884 that strenuous efforts should be directed in the future to provide for, extend and improve, the elementary education of the masses. In the important Resolution of the Government of India, dated 20th March, 1897, on Agricultural Education, it was urged that the extension of primary education among the agricultural population was essential to all agricultural improvement and reform. There have been many other similar pronouncements of the Government in favour of the extension of primary education among the agricultural population. Notwithstanding all this, however, primary education has made but little progress among them. The percentage of the number of children at school to that of the total number of the school-going population in the whole of British India has risen in these hundred and four years to only 6.05 per cent. for males and 1.24 for females. Nearly 90 per cent. of the population of India as a whole is still illiterate. In striking contrast with this has been the progress of education in other countries. Since the Education Act of 1870 made education compulsory in England, illiteracy has been practically banished from the land. Japan has achieved the same progress. The Compulsory Primary Education system was introduced in 1872; by 1873 (the number at these schools had already reached 28 per cent.) the percentage had risen to 51, by 1893, to 59 and by 1904, to 93 per cent. of children of school-going age. It must be higher still now.

I have drawn the attention of the Commission to these facts to show that, if the condition of the agriculturist is really to be ameliorated, and if the recommendations of the Commission are not to share the fate of those of the other Commissions, it is essential that the system of compulsory primary education should be introduced as early as may be practicable in every part of British India.

QUESTION 25.—WELFARE OF RURAL POPULATION.—In his valuable brochure on *Agriculture in India*, published in 1915, Mr. (now Sir James) MacKenna said:—"Of the industries of India agriculture is, by far, the greatest, and in a rough estimate recently made the annual value of the agricultural produce of British India is taken at over 1,500 crores of rupees, or £1,000,000,000. Of its immense population at least two hundred millions are dependent for their livelihood on agriculture or the industries subsidiary to it, and except in the few manufacturing cities, the atmosphere is altogether agricultural. Over vast tracts of land the only common interest is agriculture, the monsoon, the state of the crops, the health of the cattle." I fear that, notwithstanding these patent facts, the importance of agriculture in India is not fully realised by the bulk of the officers of the Government as it is not realised by the people. I am led to this opinion by their attitude towards agriculture. There has been no lack of expressions of sympathy with the agriculturists. Some years ago, a former Viceroy said:—"Our land revenue tells a tale of increasing wealth—of wealth to great proprietors—but still more, I hope, of abundance of the necessaries of life to the small tiller of the soil. He is the man we must strive to help. He is to a great extent the backbone of the population of India. On his welfare depends much of the happiness and contentment of the people." But these expressions of sympathy have not, unfortunately, led to adequate and systematic efforts to promote the welfare of agriculturists. I venture to

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think that the enquiries of the Commission have already shown that, acknowledging all the improvements which have been effected in some parts of the country in the lot of the agriculturist, and speaking generally, the small tiller of the soil is still not provided with a sufficiency of the necessaries of life. I say this with special reference to the condition of tenants in the United Provinces and Bihar and Orissa. In all ordinary years the cultivators live for a good part of the year on advances, and in unfavourable years they have to increase the amount of their debt. A very large number of the lower middle and lower classes of the population clearly demonstrate by the poorness of their physique that they are habitually starved. As a rule, a large proportion of them are in debt. A comparison of their condition with the condition of the tillers of the soil and landless labourers in some more favoured parts of India, and with those of the countries of the West, would show how great is the danger to the agricultural prosperity of India if the condition of its agriculturists continues to deteriorate, as I fear it has been deteriorating. The statistics of births and deaths are sadly eloquent of this.

It should be remembered that we are living now in an age of world competition. The prices which wheat and cotton and other produce of the soil fetch in India are determined by the output of those articles in America, Canada, Egypt and other countries. In this competition the difference in the physical, intellectual and moral equipment of the tillers of the soil in different countries must form an important and determining factor. If the prosperity of the Indian cultivator is to be assured, if he is to hold his ground in the industrial warfare to which he is exposed, he must be helped to live a more robust, and, economically, a higher life in the future. He must be helped to cultivate more self-respect and self-reliance and a proper sense of his dignity as a man. He must be taught to look an officer of Government, executive or judicial, revenue or police, and a zamindar or his agent, in the face. He must be taught to think that he has the same elementary rights of citizenship as his more prosperous fellowman.

Towards this end the first thing needed is that a larger share of the fruits of his industry should be left to the cultivator than is the case at present. I urged this twenty years ago as a member of the United Provinces Legislative Council, and I beg to repeat here what I said there. After pointing out the deplorable condition of the people in those Provinces, I said:—"That is the state of things which loudly calls for improvement. And the first measure that I would suggest towards that end would be a reduction of the burden on land. The vast mass of the people of these Provinces depend for their subsistence on land. In the report of the last census of 1901, over 66 per cent. of the people were returned as workers at, or dependent on, pasture and agriculture of all kinds. A reduction in the land revenue demand, which would result in a larger measure of the fruits of his industry being left to the tiller of the soil than is the case at present, would be the surest means of effecting an improvement in his position. I would go further and say that nothing else will, without it, bring about the measure of improvement which is needed. I am supported in this view by the opinion of no less eminent an authority than Mr. J. E. O'Connor, late Director-General of Statistics in India, expressed in the admirable paper which he read nearly two years ago before the Society of Arts in London. Speaking with an experience of forty years, spent on a study of the economic condition of the people, Mr. O'Connor pointed out that the condition of all classes of persons who depend directly on land calls for much improvement, and pleaded earnestly for a change in the present agrarian policy of the Government. 'It is no complete defence of that policy,' as he rightly observed, 'to compare the assessment on the land to-day with the assessment in the days of our predecessors. It does not follow that we are moderate in our demands on the land because we do not take so much as

was squeezed from the cultivators by Rulers and Governors who were highly esteemed if they did a man the favour of allowing him to live. We ought to arrange to let him live and thrive, not take from him the competition rent of a private landlord.' "

" Mr. O'Connor went on to point out in clear words the right course which ought to be pursued if the condition of the agriculturist is to be improved. He said:—' It is doubtful whether the efforts now being made to take the cultivator out of the hands of the moneylender will have much effect, or, even if they have the fullest effect, that they will materially improve the cultivator's position, until a large share of the produce of the soil is left in his hands, and he is protected against enhanced assessment by Government officials and against enhanced assessment by private landlords. This, as I have said, is much the most important of Indian industries, more important than all the rest put together, and it should receive from the State more discerning attention than, I am afraid, has as yet been given to it. We must appreciate to the full all that the State is doing, or proposing to do, in the provision of irrigation, in the provision of advances for improvements, in lessons on reformed methods of cultivation, in the introduction of new plants and improved implements; but important as these are—specially the development of irrigation—I have little doubt that the reduction of land revenue by 25 or 30 per cent., if the reduction is secured to the profit of the cultivator, would be of far more value in the improvement of the class who constitute the bulk of the population and who contribute most largely to the finances of the State.' "

General.—I earnestly desire that the labours of this Commission should usher a new era of agricultural improvement and reform in this country. For this it is necessary that the importance of the subject should be brought home both to the officers of the Government and to the people in a striking manner and their interest and enthusiasm enlisted in the cause. Towards this end, I beg to suggest that a Royal Agricultural and Industrial Institute should be created with His Majesty the King Emperor as its Grand Patron and His Excellency the Viceroy and the Ruling Princes of India as Patrons, and its branches established in every district in India. It should be the object of this association to devise measures to enlist and maintain the interest of the people in the improvement of agriculture and generally in rural reconstruction. The villages should be improved and should provide all the advantages of education and the amenities of a civilised life free from the disadvantages of town life. The Government and the public owe it to the teeming millions of cultivators who toil and moil to keep them provided with all that makes existence comfortable, that a grand sustained endeavour should be made to ameliorate their condition and to promote their happiness. I hope and pray that the labours of the Commission may lead to this result.

Oral Evidence.

39,801. *Sir Henry Lawrence:* Pandit Madan Mohan Malaviya, you are a Member of the Legislative Assembly and the Vice-Chancellor of the Benares Hindu University?—Yes.

39,802. We are much obliged to you for your note which has just reached us?—I am sorry I could not send it earlier.

39,803. We cannot examine you with a detailed knowledge of your note, but if you will develop your ideas, we will be glad to hear what you have to say. I see one chief point that you make is the desirability of the encouragement of agricultural teaching in the University?—Yes.

39,804 You propose, I understand, to have a Faculty of Agriculture in the Benares Hindu University, is that so?—Yes.

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39,805. How far have you gone towards establishing that Faculty?—We have done nothing beyond preparing a scheme. We had a scheme prepared in 1918 by Dr. Harold Mann and Sir Ganga Ram and we have not been able to obtain funds. Sir Ganga Ram has promised us a lakh of rupees for a canal; in fact he promised to bear the whole cost of the canal. We have applied for the acquisition of the land and we have not yet got it. Then we are waiting for a donation from the public or help from the Government in order to start it. The Hindu University has been started mainly with the help of the public donations, from the Princes and the public. We have raised a crore and three lakhs from the public and the Government contributed last year two lakhs. So we are waiting for a donation from some public donor or from the Government.

39,806. All your money is spent on buildings and land?—We have spent nearly 65 lakhs on buildings and equipment because we had to start on an entirely new site and we had to keep 50 lakhs as a permanent endowment.

39,807. So at present you have not got the funds necessary for carrying on the agricultural teaching which you wish to?—No.

39,808. In this scheme is it your intention to have some research work done in agriculture?—Certainly; we are already doing it in our Botanical Department. We are carrying on research on plant physiology and it has been going on for three years. In fact the Benares University, I understand, is the best equipped of all Universities in plant physiology; so I was told.

39,809. You have not been able to do anything towards collecting your staff for agricultural teaching and that will all have to come in the future?—Yes.

39,810. Will you be able to secure men of the standard you require for teaching agriculture?—Certainly. Professor Inamdar is a graduate of the Poona Agricultural College and he is also a Cambridge man. He is the Professor of Botany in the Hindu University and he is carrying on this research in plant physiology; also another student of his is carrying on the work. So we shall not have difficulty in finding men competent to teach.

39,811. Can you tell us what is your view of the relation that should obtain between research work done by the Imperial Government and research work done by the Provincial Governments? Have you studied that?—No, I have not studied that point; but my opinion is that so far as possible research should be carried on at the Universities and at other technical institutes established by the Government and largely and increasingly at the Universities. If you want to interest a growing number of young men in research work, it is best to concentrate it in a large measure at the Universities, because you attract there youths from different parts of the country. They are keen about their work and the result is likely to be more satisfactory than otherwise.

39,812. Is it your idea that these youths will be attracted to taking a degree in agriculture or that they will study agriculture as one of the subjects in a degree in science or something else? What is your idea?—My idea is that they should take a degree in agriculture; also a certain amount of knowledge should be imparted in other degree courses as an optional subject.

39,813. Degree in science?—Yes; both systems should be open so that those who want to go up for a degree in agriculture will have more of it than those who want to take a science degree not specially in agriculture.

39,814. Has your University already worked out any syllabus for including agricultural subjects in your science degree?—Not yet, because we are not yet equipped to teach it.

39,815. As between the Imperial Government and the Provincial Governments, should research work be conducted by officers of the Imperial Government or by the Provincial Departments of Agriculture?—I think all officers, whether they belong to the Imperial Government or the Provincial Government, should be attached to Universities except in cases where an institute has already been in existence and is at work. But officers of Government, whether they belong to the Government of India or the Local Governments, working independently, will not be able to create as much enthusiasm for research as officers of the Government working at a University.

39,816. You have in view something like the Cambridge Degree of Agriculture, have you?—I have not got a very clear idea of that degree, because I have never been to England. I have not looked into their curriculum.

39,817. For the most part agriculture is taught in separate institutions in England?—That is our idea; we want a separate College of Agriculture within the University.

39,818. *Sir James MacKenna*: Like the College of Engineering?—Yes. We have a College of Engineering, a College of Arts and Science. We want to have it within the University so that students will have all the benefit of the academic atmosphere of the University and the corporate life.

39,819. *Sir Henry Lawrence*: I am not quite clear how an institute such as Pusa will come under your scheme. You would not propose that Pusa should be related to any University, would you?—I would for this reason, that these very people who are carrying on the work at Pusa ought to be able to be available to the University so that the students may derive the benefit of their knowledge and experience.

39,820. *Professor Gangulee*: For post-graduate work?—Yes, to guide post-graduate work.

39,821. *Sir Henry Lawrence*: At present Pusa takes men for post-graduate work. You would not limit post-graduate work to one particular University?—No, I would not.

39,822. Apart from University teaching and the research connected with it, research work is being done by the Department of Agriculture. It is in relation to that that I want your opinion, whether such officers should be employed by the Government of India or by the Provincial Governments; have you thought about that?—I should put them in the University; or if there is a special institute like the Government of India Institute at Pusa or Dehra Dun, they may continue to work under the Government of India; but I am entirely in favour of their being attached to one University or more.

39,823. Now there is work going on down at Coimbatore, sugar cane research work. Have you ever seen that? You have not been there?—No, I have not.

39,824. That is a very important branch. It would not, so far as I can see, have any close affinity to any course of teaching in the University; it is rather outside that. At this moment, the Government of India employs certain officers to work down in Coimbatore and send their canes to all the different Provinces, including the United Provinces, where a good deal of work has been done. That is a work being done by the Imperial Officers working inside a Provincial Government area, and a question has been raised whether that is the best method of work or whether those officers should be definitely placed under the control of the Provincial Government?—In my opinion they should work under the jurisdiction of the Provincial Government, and as for special work of that nature, of course it is to be kept up for the good of the country as a whole. Particular experiments may be made and particular research

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carried on at University centres wherever these institutions exist. For instance, the Indian Cotton Committee sent a particular problem to Professor Inamdar, who grew a large number of cotton plants and was carrying on experiments when he suddenly fell ill. So the Professors who are placed at Universities will be able to carry on research in particular matters if they are asked to do so, but where institutions like those in Coimbatore exist the experiments should be carried on on the spot; but the officer in charge of such an institution should, in my opinion, be placed under the Provincial Government.

39,825. Why do you prefer that?—The Imperial Government is far too far away from the seats of these institutions, and the Imperial Government has not got any member on the staff of it particularly qualified to examine the research work that is going on in the different institutions. There may be an officer for a time, but you are not sure that you will have such an officer always, whereas the Provinces are large enough to require a self-contained arrangement and they have Universities where you have got a number of scientific men working; these experts working within the Provinces will be able to collaborate with other Professors of Science at the University, getting assistance from them, assisting them, and on the whole they are likely to turn out better work than if they are left to work in isolation.

39,826. Improbability of getting skilled control from the headquarters of the Imperial Government is your main obstacle?—That is one thing. Secondly the officer will not have the same inspiration that a man working at a University within the Province working together with the men in the Province, will have. I will give an illustration. A Professor of one subject in the Benares Hindu University talks to a Professor of another subject in the University and I have found that sometimes one of the Professors suggests a problem of research which is taken up by the other Professors, so that the larger the number of scientific men we can gather at one centre, the better will it be for the cause of scientific research and that is more likely to be the case when you have these officers at present working under the Government of India placed definitely under the Provincial Governments.

39,827. I am looking at it from the point of view of finance. Do you think it is more likely that agricultural research will be liberally financed by the Imperial Government or by a Provincial Government?—It should be financed by the Provincial Government. Agriculture is the most important of our industries. It has never yet had the chance of development on scientific lines. A great deal of expenditure is needed and the Provincial Governments must be instructed and made to enthuse about the subject.

39,828. You do not think that it is easier to finance one body, the Government of India, than seven or eight Provincial Governments?—The Imperial Government should have less and less to do with matters which can be administered within the Province. There is no particular advantage in the Imperial Government retaining institutes of science under its control. All the grants to these institutes should be made generally by the Provincial Governments. The Provincial contributions are being remitted and Provincial Governments ought to be able to find all that is necessary to make them first class institutions in their own Provinces.

39,829. And you are not afraid of extravagance through any overlapping or duplication of expenditure?—I do not see why it should not be easy to avoid it because the problems to be taken up are known.

39,830. Would you have some co-ordinating or supervising agent at the top to see that it was not extravagant?—I do not think that it is necessary to have a supervising staff at the top. I should leave it to the Faculties of Science to appoint an executive committee or a body of their own for guiding research, for seeing that there is no overlapping and no extravagance.

39,831. *Professor Gangulee*: An all-India executive committee?—Yes; the Faculties of the different Universities might appoint one, just as you have the Indian Science Congress which meets every year. They may be asked to appoint a committee from the Faculties and these gentlemen should constitute the executive committee for research work. My idea is to enlist the enthusiasm of all workers in science throughout the country in the cause of research. That is more likely to be brought and secured by enlisting the services of the Professors in the different Universities than by having one man at the top to guide. I would also invite distinguished experts from England and other countries, if necessary, to help and guide and encourage the research; but the administration of the thing should not be entrusted to one central officer.

39,832. *Sir Henry Lawrence*: Would you form a committee representative of all the Universities of India?—Yes, a central committee for research.

39,833. For all scientific research or specifically agricultural research?—It should be for all scientific research, but certainly for agricultural research.

39,834. You say there has been some precedent for that in the Science Congress?—Yes; the Science Congress meets every year. They place the work that each man has done before the Congress and it is giving a great stimulus to research work.

39,835. Could you tell us how this Science Congress is called together and whom it consists of?—There are a number of scientific men who are members of the Congress; they belong to different Universities.

39,836. Elected by the Universities?—I do not remember whether they are elected, but there is a membership subscription and anybody who wishes to join it can become a member, so far as I remember. I have noted that during the last few years in which this Congress has been in existence it has stimulated a great deal of research work among the Indian Professors of Science. The junior men as well as the senior men have been stirred up to work since the congress began to meet.

39,837. Who presides over it?—Every year some gentleman of eminence is selected. For instance, Dr. Forster presided at Benares two years ago.

39,838. Has there been a meeting this year?—Yes, at Lahore, and Dr. Jagadish Bose presided over it.

39,839. Is there any standing committee or secretary?—They have a standing committee, an executive committee, and they have a secretary. They carry on the work of the congress. For instance members are invited to send in information as to what papers they wish to read, what subjects they wish to discuss, and the executive committee decides what subjects should be taken up for discussion and what papers should be read at the conference, what subjects should be published and so on.

39,840. You say the importance of agriculture in India is not fully realised either by the bulk of the officers of Government or by the people. Do you think that there is any increasing realisation by the people of the importance of agriculture in India?—To my mind, not a conscious and satisfactory realisation: those who are engaged in it carry it on as they would carry on their normal business. They have not got a sufficient knowledge of the great possibilities of agriculture, of what scientific agriculture can do. I feel myself that a great deal of propaganda work should be carried on to bring home to the people the great possibilities of scientific agriculture.

39,841. You yourself have been preaching this for many years?—Yes.

39,842. Are you a landowner or an agriculturist?—No, I do not own a single acre of land.

39,843. It is merely the result of your general observation that has made you so enthusiastic?—Yes, I have moved among the people in villages and

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towns, and somehow or other I began to take an interest in agriculture long ago.

39,844. Do you think that from the political point of view there will be any difficulty in securing the necessary funds for improvement in demonstration, research and in other directions, for which large sums of money would be required?—I think the Assembly and the Councils will gladly vote funds for this purpose, if the Government take up the matter in right earnest.

39,845. Do you think that the necessity for spending money in this direction is realised now by the political representatives of the people?—I cannot speak for all, but I know that some members are very keen about it; and I feel that a greater realisation can be brought about by giving them information as to what agriculture has achieved in other countries and what it can achieve here. My fear is that there is not as widespread a knowledge about what scientific agriculture has done in other countries and what can be done in this country, as there ought to be.

39,846. You think that that knowledge can be disseminated chiefly through the medium of the Universities?—The Universities will be very important centres for disseminating that knowledge. I should like to see Universities, colleges and schools all working in that direction. At present, I want to create an idea in the minds of the people that this is a most important department which requires particular attention, that this is where we get all our food and wealth from. That idea is not sufficiently realised.

39,847. *Professor Gangulee*: Who is going to do this propaganda? Will it be the Provincial or the Central Government?—If you leave that to be done by either the Provincial or the Central Government, it may be done through them; but I think the best centres are the Universities and the schools all over the country. I would make every school in the country a centre for instruction and from which these ideas can be propagated. I have suggested the formation of an agricultural and industrial association for the whole country and I think that such associations should be started with branches in every district. I want to have regular propaganda to convey the correct ideas about agriculture to the people and I want to do it as a regular system.

39,848. *Sir Henry Lawrence*: You end your note by suggesting that a Royal Agricultural and Industrial Institute should be created, with His Majesty the King Emperor as its Grand Patron and His Excellency the Viceroy and the Ruling Princes of India as Patrons and its branches established in every district in India. That is one of your chief constructive suggestions?—I want the cultivator to be respected much more than he is respected at present. I am sorry to say that he is not sufficiently respected. I want that a man who is a good cultivator should be respected as much as a pleader or doctor because I think he contributes to the national wealth, and I also want that this Institute which I have suggested should be the means of elevating the status of the cultivators.

39,849. That is a very laudable object indeed and requires propaganda on a very large scale?—Yes, it requires that there shall be a very clear realisation by those who are responsible for carrying on the Government of the country and also by leaders of public opinion, of the importance of the subject. At Darbars we see a great number of zamindars, public servants, policemen, and other officers; I should like to see a large number of the representatives of the tenants invited to such Darbars and I want them to feel that they are quite as good and as honourable as any other men. At present they are looked down upon. The policeman, the tehsildar's peons, the zamindar's peons all look down upon them; in fact they are treated like footballs, kicked about like footballs. I want that they should be treated as honest fellow men who do well in tilling and undergoing all such hardships in order to feed the country, to support the Government; and we owe a debt of gratitude to them.

39,850. How would you bring this about?—By starting an association in every district, in every *tehsil*, by getting officials of Government, the zamindars of the district and other important men of light and leading, to meet from time to time at these associations, to hear lectures, to see magic lantern shows, to obtain literature regarding the progress of agriculture in their own district and in other countries. The school and the college can do a good deal with these monthly meetings of all respectable prominent men of the district or *tehsil* in order to consider subjects relating to agriculture, in order to promote the welfare of the agriculturists; all these things will help to put these ideas into fruition.

39,851. Would you establish an official order of merit in agriculture?—I have not thought of that; but I think that the agriculturists would consider it a great honour to be invited to important assemblies or Darbars, and that would be quite sufficient to raise their prestige.

39,852. You do not think that the agriculturist would like to have a red or blue ribbon round his neck?—There are people who like it and there are others who do not. I do not want them to be bribed into good work. I want them to earn their reward for good work not by the award of titles or *sanads*, but by the appreciation of their fellow countrymen. I am not opposed to awards being given to them. I have not thought of that. If I may put it shortly, at present I feel that the cultivator is not treated with that respect and consideration with which he should be, and consequently he himself thinks that he belongs to a humble status. I want that he should feel that he is quite as good as and as honourable a worker in the country's cause as any other man. He is a most industrious and honest worker and he ought to receive recognition and consideration as such.

39,853. Are you going back to the system of Manu or are you going to improve upon it?—If we can go back to Manu's system, that would be a wonderful thing. But I would take what Manu has given us and what modern science has given us; I would combine both.

39,854. In your note you compare the progress of education, general elementary and agricultural education in India with that in Japan? But the figures which you quote will not go very far?—I am sorry I had not the latest figures when I sent in the note. The agricultural schools that they had in 1922 were: 115, A class; 209, B class; 10,791 C class. The classes are divided according to the ages of the pupils. Students from the age of 14 to 17 are put into the middle schools. Of such there were 115 schools having 1,385 teachers, 22,950 pupils and 6,776 graduates. The higher elementary school was of the next grade. There were 209 schools, with 1,186 teachers, 25,920 pupils and 8,224 graduates. Then there were continuation of supplementary schools for boys of 12 to 13 years or even older boys. There were 10,791 schools with 2,537 teachers, 662,778 pupils and 166,548 graduates. These were agricultural schools. There were also technical schools which were quite separate from these agricultural schools.

39,855. I gather from your suggestion that in India very little has been done to improve primary education in recent years as compared with Japan?—Yes, for instance I am sorry to find from the Educational Report that there are 151 schools with 8,596 pupils. This compares very unfavourably with what we find in Japan, where there are 346 technical and industrial schools with 20,045 scholars.

39,856. I find it a little difficult to follow these figures in your note as showing any very considerable work being done in Japan? Take the figure of expenditure for instance; the Government subsidy is £15,000?—You will note that that was in 1906.

39,857. And you have got later figures?—Yes, I have not brought these later figures which show the expenditure. But my object in drawing attention to the system was that the system in Japan appealed to me. It was

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not done with the intention of comparing the exact amount spent there and here, but just to invite the attention of the Commission to the system that they introduced.

39,858. Then you lay stress on the fact that it is essentially necessary that a system of compulsory primary education should be introduced as early as may be practicable in every part of British India. What progress has been made in your own Province? Have you any compulsory education yet?—An Act has been passed by the Provincial Council but that was brought about very recently, and I cannot say what action has been taken.

39,859. When was it passed?—Last year or the year before that.

39,860. And you do not know whether it has been actually enforced?—I have no information about the action taken with regard to it.

39,861. Do you know if that Act places it in the power of the District Boards to apply for grants and introduce compulsion?—Yes.

39,862. Is there no enthusiasm on the part of the District Local Boards to take advantage of this power?—I have not had the time yet to notice that. They have been busy with the elections and I suppose now that the elections are over they will indicate their desire as to their future plans and I think myself that there will be a great deal of keenness displayed hereafter. It is all a question of funds. If funds are forthcoming I have no doubt that the Boards will wish to introduce compulsion.

39,863. In order to introduce it they will have to tax themselves?—Yes, that is true.

39,864. And that is likely to diminish their enthusiasm?—That is the case everywhere unfortunately, but it cannot be helped.

39,865. In spite of that, you think they will take advantage of the power they now have?—Yes, I hope they will.

39,866. *Mr. Kamat*: The Talukdars of your Province have the capacity to pay?—They do make voluntary contributions, if that is what you mean. But as to the payment of taxes, the tax will have to be paid whether they like it or not.

39,867. *Professor Gangulee*: What is the attitude of the villagers towards compulsory education?—Many of them will be in favour of it, some will not. Just turn to England and think of the fears entertained by some people there. They think that if you impart a little education to the humble man in the street, he will change his ideas and will not be easily amenable to discipline, and so on. But the bulk of the people are in favour of it; the time has gone by when considerations of whether particular sets of individuals are in favour of primary education or not should be noticed.

39,868. *Sir Henry Lawrence*: Do they exercise any controlling power inside the Local Boards?—Yes, they are well represented on the District Boards and in the Legislative Councils.

39,869. If there was opposition that would be serious?—I do not think that there will be any serious opposition. There may be a few individuals here and there who will disapprove of it, but I can vouch for the whole body of them, and say that they will not oppose it. That is my belief.

39,870. In another passage you say that people should be encouraged to form societies for co-operative production and marketing, for effecting improvements in their villages and carrying out objects of common concern, for the use of agricultural machinery, for cattle breeding, for crushing of bones for manure, &c. You are acquainted with the recent developments of the co-operative credit movement in the Provinces?—Yes, generally.

39,871. We have had a certain witness before us who said that it has not been successful in so far as banking is concerned?—There are reasons

for that. The system requires to be revised. At present the great need of the situation, so far as the rural population is concerned, is to adopt a system which will appeal to them and which will inspire confidence in them. The movement must be made more popular than it is at present, and that cannot be done by merely starting banks or co-operative societies, but by educating the people about its working, finding out what complaints they have and remedying them.

39,872. Is that education proceeding? Is there any general feeling amongst influential gentlemen that co-operation is desirable and should be fostered?—It is of a very general and vague kind; there is not a living conscious feeling that this is a work to be done; that is what is wanted.

39,873. There are not many workers in the field?—There are some workers who have done good work in the Province; there are many who have been connected with the co-operative societies who have done good work in their own way, but there is not that feeling of something like a religious enthusiasm for the cause.

39,874. Is there any institution in your Province corresponding to the Servants of India Society?—Yes, there is a branch of that society and of the Social Service League; but there is no institution at present working consciously to promote ideas of co-operation to the extent to which it should be promoted, so far as I know; there should be such an institution. I believe much more progress could be made if there were more propaganda work.

39,875. Do you think these societies can advance until banking has been put on a satisfactory basis?—They can, even as things stand at present. Take for instance, the export of bones; I see bones going out from almost every station; if the people were instructed as to the advantage to be derived from the use of bones, and if they were helped to start a bone crushing factory, I do not think they would hesitate to co-operate in the matter. I do not like to see the bones of any district going out of that district when they can be used in that district.

39,876. Are there any companies being formed in your Province to crush bones and deal with them?—I have no information. There is also an enormous quantity of hides being exported which ought to be tanned in the village; the village cultivator should be taught to tan the hides and make shoes and other leather articles in the village, which will give employment.

39,877. I have heard that Mr. Gandhi preaches that very strongly, but has he many supporters in that view?—He is gathering supporters.

39,878. In your Province?—In my Province also there are many men who follow him; there are a very large number of people who respect him.

39,879. They respect him no doubt, but will they tan hides at his bidding?—Yes, there are Brahmins who have tanned hides; there are Brahmins who took it up at Agra many years ago, and there are others; there is Mr. Wohtan who was employed in Rewah in the tanning department; he is a Kashmiri Brahmin. The feeling that at one time existed against taking up these trades has very much died out.

39,880. *Mr. Calvert*: Amongst Hindus?—Yes, amongst Hindus; amongst men of the highest caste.

39,881. *Sir Henry Lawrence*: So that you feel the time has come when these societies should be established, and you are hopeful that they will work effectively?—Yes. Two days ago a gentleman told me that in one village some of the Chamars refused to deal with a carcass, and he found it led to a great deal of quarrelling. Then this gentleman told me he got his volunteers to do the work, and later on the Chamars who used to deal with these dead bodies came and said, "We shall do it." So that volunteers are prepared to take up the work which the Chamars will not do.

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39,882. *Mr. Kamat*: Is not the man who teaches tanning at the Cawnpore Technological Institute a high caste Brahmin? I am referring to Mr. Hudlikar?—Yes, he is.

39,883. *Sir Henry Lawrence*: And at Bombay?—Yes.

39,884. *Sir James MacKenna*: You lay very great emphasis on the University connection with agricultural research and teaching?—Yes.

39,885. The principal reason I think being the University atmosphere which is thus created?—Yes.

39,886. At this stage I should like to say how much the Members of the Commission enjoyed their visit to the Hindu University at Benares, and how much I was impressed by the very fine equipment you have got?—It was very kind of you gentlemen to visit it, and on behalf of the University I beg to thank you all.

39,887. But do not you think that is rather starting at the top; should not agricultural research start on a lower footing before it aspires to University status?—The rays of the sun strike the peaks of the mountains first. Both methods should be adopted. You might start at the University or you might start at the bottom with the primary school, but I think both lines should be followed. No man can be a good teacher unless he carries on research himself; that you, Sir James, know. Every scholar is agreed that a man to be a good and efficient teacher must continue his own studies and researches; therefore we insist upon our Assistant Professors carrying on research work; I have found that that creates enthusiasm; from the time when they commenced to take up research work, they have become changed men.

39,888. I take it that, so far as the Hindu University at Benares is concerned, your idea is to have the Faculty of Agriculture working in a separate building like the Faculty of Engineering?—Yes.

39,889. What degree do you propose to give: that of Bachelor in Agriculture or Bachelor of Science in Agriculture?—I have not discussed that matter with my Syndicate, but I do not know that there is any very strong difference of opinion on the point; we shall of course adopt the course which is most approved in other Universities.

39,890. I take it that the training in pure science, chemistry, botany, physics, and so on, could be given in the existing laboratories of the college?—Yes.

39,891. That would effect economy in working?—Yes. We are extremely well equipped in these science departments.

39,892. Have you any idea what is going to happen to these young undergraduates in agriculture when they are let loose upon a hard world?—Yes, I want to send them out to the districts where they can work with the farmers; where they cannot work with the farmers, I want them to obtain a plot of land such as has been given by Sir Malcolm Hailey's Government, on the advice, I understand, of Sir Ganga Ram; we should like them to have plots of land given to them so that they can put their knowledge to practical test.

39,893. *Professor Gangulee*: Do you mean given to them by the Government?—Yes.

39,894. On lease?—Yes.

39,895. *Sir James MacKenna*: Your University is in a peculiar position in that it has no territorial basis; it is based on your religion and, therefore, is for all India?—Yes.

39,896. So that students coming from Benares University will be scattered to all the corners of the Indian Empire?—Yes, and my idea is that

they should be found working in every *tehsil*; there should be at least one graduate of agriculture in every *tehsil*. There will, also, be a number of men who have not taken the degree course, who would be practical farmers. I want to make the village as attractive to any man as the town is, and more so, if possible.

39,897. In fact, you desire to develop rural uplift in its widest sense?—Yes, reconstruction and uplift.

39,898. Then, as far as the Hindu University is concerned, your position is quite clear. Would you carry the question of affiliation to the extent of affiliating all existing agricultural colleges to a University?—Yes, that is my idea.

39,899. Of course, there are objections to that raised on both sides; first of all, the University is apt to say, "Your standard of admission is not high enough," and then the agricultural college is apt to say, "We are not going to have other Faculties interfering and correcting our curriculum"—But that is a matter of adjustment. The Universities must maintain a high standard; I am entirely opposed to lowering of standards for graduates; there must be a lower grade of examination for practical farmers; what that is to be is for experts to advise. Those who are to work on the land need not necessarily take a degree, a diploma will do. We have at the Benares University, in the College of Engineering, a diploma course and a degree course, and we shall institute a diploma and a degree course in agriculture. I should teach agriculture through the medium of the vernacular. They must learn English in order to derive the advantages of up-to-date information, but that should be practical knowledge; they need not be familiar with the English classics. I should be sorry to drive anybody from acquiring a knowledge of those classics, but we must attempt only that which is practicable.

39,900. That is to say, in the University there would be a vernacular course for the diploma?—Yes, and also in other colleges, English being taught as a language.

39,901. *Sir Ganga Ram*: Have you got books in the vernacular on agriculture?—Not yet; some have been prepared, I understand, but they are very few; many books on agriculture in the vernacular will have to be prepared. One donor has given Rs.50,000 to have books prepared in Hindi.

39,902. *Sir James MacKenna*: But at present, at Benares, are you giving degrees for courses of study pursued in the vernacular?—No, no English degree is given to a student who does not read through the medium of English.

39,903. With regard to Pusa, do you think that on account of its isolated position and its having grown up as a separate institution, the question of affiliation to a University need not be pursued? Would you leave it as it is?—I wish the question to be considered as to how the staff of the Pusa Institute could be made more available to help existing Universities, whether in Bihar or Benares. I do not wish to wind up Pusa; it is a beautiful place and very well equipped; I should like the services of the scholars there to be made more available to students. I do not confine that to Benares and Bihar; it might include Lahore, for instance.

39,904. You feel that the staff at Pusa might be made available for any college or University in which agricultural research was studied?—Yes; the advantage would be that the research worker, being in touch with a large number of students, would be able to pick up the most promising students for research work; that would be one very distinct advantage.

39,905. The position is, that you would like to have an interchange of research staff between Pusa and the colleges in other parts of India for
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their mutual advantage?—Yes; unfortunately, the Universities are not so well equipped with staff as to be able to spare many men at present; but occasionally we could send men to study particular subjects.

39,906. I want to put one general question to you as a prominent political leader: What is your view as to the selection of men for scientific research? Would you be limited by considerations of nationality or would you look for the best men on the particular subject?—Does science make any distinction between man and man on the ground of race or creed? It does not, and so in scientific discussion considerations of race should be shut out.

39,907. You want the best man?—I consider it almost unthinkable that any man who loves science should allow any considerations of race to count; we honour men of science wherever they come from.

39,908. *Professor Gangulee*: You suggest there should be a Faculty of Agriculture in every University?—Yes.

39,909. In the United Provinces you have Lucknow University, Allahabad, Aligarh and Benares?—Yes.

39,910. Would you have four Faculties in one Province?—If they can find students and can equip themselves; the Faculties will not be started by every University at once, but a University that desires to start a Faculty of Agriculture ought to be helped to do so. I want a number of young men to be diverted from the study of law to agriculture and commerce; I think it is almost a crime that these young men are not given some other interest than that of law.

39,911. *Sir Ganga Ram*: And yet you established a Faculty of Law before a Faculty of Agriculture?—Yes, unfortunately, because it did not cost anything; I was opposed to it for a long time.

39,912. *Professor Gangulee*: You are in favour of affiliating, for instance, Cawnpore Agricultural College to the University of Agra or the University of Allahabad?—Yes; I should prefer the University of Allahabad because that University is well equipped in science; all its scientific departments are extremely well equipped.

39,913. Your idea is that the recognition of agriculture as a teaching subject by the University would attract students?—Yes.

39,914. You desire to see research concentrated in the University; would not you give the Provincial Departments of Agriculture any opportunities for conducting research?—No, the men who want to conduct research should be at the University, that is the place for them. If a Provincial Government has already got facilities for research, I should not object to those facilities being used; I do not wish such equipment to be scrapped; but every capable man who can carry on research ought to be attached to some University, so that the benefit of his knowledge may be given to students.

39,915. When you say attached to the University, have you in your mind that the research should be carried on in some particular locality, or do you mean that the research institution should merely be affiliated to a University?—If an institution exists, such as at Cawnpore, some work must be carried on at the farm; so far as laboratory work is concerned, it can be carried on as well at the farm as at Allahabad University, if it is affiliated to that University. That will depend upon the stage of development that the institution has reached. If an institution is fully equipped for research and investigation, that research and investigation can be carried on on the spot, but, to my mind, such research will always suffer by reason of its isolation.

39,916. In these Universities, I take it, you would only give the degree of Bachelor of Science in Agriculture?—Yes, and Master of Science later on.

39,917. Anybody who desired to pursue his agricultural education further would be trained at Pusa; is that your idea?—If Pusa offers greater advantages than we provide at Benares, certainly; but I have suggested that the best men at Pusa should be available at Benares to help my students there.

39,918. That could be done by frequent meetings and so on. There is one very interesting point that you raised in discussing the subject of scientific and industrial research; you referred to the Committee of the Privy Council; you said the first thing necessary was a large supply of competent research workers, the second thing being a hearty spirit of co-operation among men of science, men of business, working men, professional men, scientific societies, universities, technical colleges, and so on. Have you any definite suggestion as to how this could be brought about in India?—Just as it has been brought about in England; every man interested knows that this work is going on at a particular centre; he sends his suggestions and he asks for information from that centre.

39,919. There must be a co-ordinating agency somewhere; who is going to bring all these elements together?—The institution itself will be the centre for co-ordination. For instance, if the University of Calcutta is carrying on agricultural research on cotton or any particular subject, those who are interested in that subject will know it; they can become members of the institute, they can join the association, attend annual exhibitions or demonstrations and keep themselves in touch with it.

39,920. But you want to bring together business and professional men and others interested in your research work?—They will be led to take interest in it if they know of the work that is going on; there should be a system of making them associates or members of an institute for this work so that they will get periodical information as to the progress of the work.

39,921. That is to say, you must have some organisation to co-ordinate various activities in different parts of the country?—To bring these various individuals and bodies into touch with each other; where many Universities exist they will all become centres for such organisation.

39,922. Are you familiar with Cawnpore Agricultural College?—I have seen it.

39,923. Do you know intimately any of the men turned out from that college?—I cannot say I know any intimately.

39,924. We are told that graduates turned out from the agricultural colleges are not efficiently trained nor sufficiently interested; what is your view?—That has been the complaint about the Cawnpore College. The men who have been turned out have been employed as *kanungos*. It is a lower standard; they did not make it a University standard. If it came to the University we would have a University standard, though the farmers' standard will be a lower standard.

39,925. Referring to schools in Japan, I think they have got the special agricultural schools in every Prefect. Do you think our District Boards have taken adequate interest in agricultural education?—No, but they have not been instructed how to take interest; you have not sufficiently instructed them about the need of it; they should be instructed or educated about it.

39,926. They are all controlled by educated men?—That is not the point; it has not been anybody's business, generally speaking (I do not mean to belittle the good work that has been done), to make agricultural education understood by these people in the way in which you want it to be understood by them.

39,927. Returning to the question of compulsory primary education, do you think public opinion in this country is quite prepared to have that?—I think the bulk of the people will support it.

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39,928. Even if it is necessary to have an education cess?—That has to come in its own time; you cannot have fruits without paying for them.

39,929. On page 709 you say: "the small tiller of the soil is still not provided with a sufficiency of the necessaries of life." You have known rural life for a long time and you come into intimate contact with these people. Is the standard of living increasing or decreasing? What is your general impression?—There are two ways of judging it. One is to see whether they have some of the articles of modern manufacture in their homes; the other is to see whether they are healthy, whether their children are strong and able to work and live. The first standard is satisfied in some cases. You will find articles of modern manufacture in some places. That does not show that the standard of living has risen in its true sense. So far as food and raiment are concerned, I find the physique of these people is deteriorating. Even in the Punjab where the condition of the agriculturist is much better than that of the peasant in the other Provinces, so far as I am aware the cultivators are not as strong now as they used to be.

39,930. Is that due to lack of nutrition or lack of knowledge?—For instance, in the Punjab they used to have plenty of milk in days gone by and they cannot have it now.

39,931. We are told that in the Punjab we have abundance of wheat?—Yes, they have wheat and *dal*, but they have not the milk; they are fond of *lussi*.

39,932. You state that the tillers of the soil do not receive adequate recognition. Why? Is there something wrong in the national psychology?—It is a vicious system that has grown up. They have been regarded as humble men always, to bow before the zamindar or the official and to be humble men. If they look direct in the face when they are talking to a zamindar or an official they will be considered impertinent. They are considered to be humble people, *chota admis*. I think they should develop a sense of self-respect and self-reliance and regard themselves as men of dignity.

39,933. Do you think the religious and social outlook of the intelligentsia is partly responsible for this?—It may be in some instances and to some extent, but the question is not affected by that entirely. Largely it is a question of the notions that have come down and these notions are not confined to this country. In other countries too the peasant was regarded as a very humble man, in England, America and elsewhere. It is the education that he has received and the progress he has made that has brought him recognition, and so it will be in India also.

39,934. He is able to assert his rights only when he is educated?—Others have helped him to understand his rights and assert them. When the Reform Bill was passed in 1868 they said "educate our masters," so that they began to educate their masters in 1870, and since education made progress, it is the men at the top who inspired the others that they were equal in self-respect to the others, and the influence of the teaching of the Bible undoubtedly prepared the way for it to a large extent. Here if you give education to the people, I do not think there will be any difficulty in creating the same kind of attitude among them both at the top and at the bottom.

39,935. Turning to another point raised by you; you say that the first requisite is that the cultivators must get a larger share in the fruits of their industry; and that the first condition necessary is to reduce the burden on the land?—That is to say the share that the cultivator has to contribute should be reduced.

39,936. That is his land revenue?—The rent that he has to pay.

39,937. Do you think that reduction in the land revenue is necessary, that it is excessive?—I do not wish to go into that question. I only wish the cultivator or the tenant to have a larger share of the profits of his industry left to him. It is a very difficult question and I am not prepared to go into the details at present.

39,938. In your universal free and compulsory primary education, would you include girls' education?—Not compulsory education. But girls are willing to go to the schools and if you provide girls' schools there will not be any difficulty in promoting their education.

39,939. I see you lay a great deal of stress on free pasture land; but as you know with the rise of population and extension of agriculture it may be necessary to utilise every bit of land that you can get for cropping?—It is a very short-sighted policy.

39,940. Do you think stallfeeding would in any way solve the problem, as it has done in other countries?—My idea of having pasture land is this. I want that the milk which people get from the cows and buffaloes should be the purest and that milk you cannot get on the stall system. If the cattle graze on the pasture land they will give better milk than on the stall system.

39,941. Are you familiar with the work of the Royal Agricultural Society in England?—No.

39,942. That Society was started practically with the same object that you suggest here; the King is the patron and a large number of influential men are associated with that Society. Do you think the time has come for starting such a society in this country?—Undoubtedly.

39,943. Do you think it will receive adequate recognition from the people who, you mention, ought to be the members?—Certainly.

39,944. In England the Society has a certain amount of finance either from donations or from other private sources. Do you think such financial assistance would be forthcoming in this country?—Yes.

39,945. From the Government?—Both from the Government and the public.

39,946. It would be an organisation consisting of officials and non-officials?—Yes.

39,947. And it would have its branches in the Provinces?—In every district.

39,948. The men working in connection with this institution would be paid men?—Some of them would be paid men and others would be honorary workers; I would have officials and non-officials.

39,949. You must have at least one paid Secretary for each district?—Certainly, one paid graduate Secretary.

39,950. It would involve a large expenditure?—But the money would come; the Government and the public would find the money; the object is important.

39,951. *Mr. Calvert*: You refer to the habitual starvation of a number of people. The evidence given before us suggests that this starvation is not so much due to the lack of quantity of food as to the lack of the essential vitamins?—Yes.

39,952. Further evidence goes to show that a whole wheat diet is much cheaper than the rice diet which leads to all these diseases?—Yes.

39,953. So it is a question of the lack of knowledge of diet?—Partly it may be so; but it is also lack of ability to purchase a nutritious diet.

39,954. It is also as much due to the old prejudice against certain types of food?—It is not prejudice; it is the predilection of the people in some

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parts in favour of certain articles. For instance, they are in favour of rice in Bengal. I am entirely at one with the idea that there should be a knowledge of the nutritious value of the foods, a propaganda among the people.

39,955. Eggs are full of vitamins, but certain people will not eat them?—They are certainly not meant to be eaten; they are for a more useful purpose. By eating them you are not allowing the birds to grow out of them.

39,956. Would you stop that sort of diet?—I would ask my brethren to give it up. I am happy with my milk and butter and I do not think there is anyone who is happier than I am with my food; nor is it less nutritious.

39,957. There is a certain amount of sentiment against certain articles of diet which might be nutritious?—It is not a question of sentiment now. You have got a scientific man, Dr. Haig of London, who has proved that a meat diet is not good for man and that wheat and milk constitute the most nutritious diet.

39,958. *Sir Ganga Ram*: I think he has also included eggs?—No.

39,959. *Mr. Calvert*: Are you acquainted with the investigation which is being carried out in Coonoor by Colonel McCarrison into the diseases due to malnutrition?—I am not aware of that. But I can tell you that a number of experiments were made at Calcutta by Dr. Nilratan Sirkar and others on a number of pigeons. A certain number of them were fed on a rice and *dal* diet and others were fed on a wheat diet, the Hindustan diet. Those that were kept on the wheat diet flourished and thrived very well and were happy and those that were kept on rice diet faded and became ill. The result of the experiments was a verdict in favour of the wheat diet.

39,960. But the rice they were fed on was polished rice?—That was a factor to be taken into account. I am told that unpolished rice is better and I certainly think it should be better.

39,961. Probably it is not quite so simple as that. As you suggest, the Punjab is more prosperous than other parts of India and it has a high death rate?—It is due to the want of sanitation arrangements; otherwise it should have a much lower death rate.

39,962. The temperature is rather pleasant to certain classes of bacteria?—It is a question of sanitation.

39,963. I think you have corrected a little slip of yours, that a reduction of land revenue would benefit the cultivator. The land revenue is payable by the landlord?—I have said that the reduction should be secured to the benefit of the tenant. That is what Mr. O'Connor said.

39,964. Do you accept the figure given to us that the land revenue in the United Provinces is only 2 per cent. of the gross produce?—I will accept it if that has been given to you by any official authority. I have not got the figure with me at present.

39,965. It is a little difficult to get below 2 per cent.?—My point is this: I judge from the result; I judge the tree from the fruit; I find that in the United Provinces a large number of tenants are in a very very miserable condition. If you go to the eastern districts, you will see it. They have not got any clothing on their bodies; their children are running naked in the winter; the people work early in the morning with a little rag on their bodies; they have not got enough clothing to cover themselves at nights. This is the condition of a large number of these tenants. I wish to see this condition improved, and I consider that if a little more of the fruit of their industry were left to them, this result is likely to be achieved.

39,966. You are thinking of rent?—Yes.

39,967. You put the figure for the children of school-going age attending school at 6.05 per cent. ?—Yes.

39,968. Are you quite sure of this figure? The figure for the Punjab is 50 per cent?—I have taken it from the last year's report of the Government of India.

39,969. Does not the figure 6.05 refer to the total population? The Punjab figure is 8.44 per cent. of the male population, and that comes to 50 per cent. of the population of school-going age. I think it is a slip?—It may be.

39,970. You have mentioned Japan several times; Japan, to a large extent, is a Buddhist country, and in Buddhist countries like Burma and Ceylon there is distinctly that tendency in favour of literacy. Can you account for that?—You create more schools and you will find that tendency. Japan has gone ahead because of the modern system of education.

39,971. Of course there is no dispute now about primary education. It is more a question of ways and means?—Yes.

39,972. You have made some remarks about land revenue or rent in India; but are you aware that in Japan the land revenue is about three times that in India per acre?—I am not aware of that, but it does not affect the question here.

39,973. Japan takes 17 per cent. of the gross produce and it is able to provide funds for educational and other improvements?—I do not object to your taking even 27 per cent. if you leave sufficient to the cultivator. It is all a question of what he can bear. If you take even more from the tenant, I do not mind it so long as you leave sufficient to him to live healthily.

39,974. But you admit the difficulty due to the enormous extra taxation which you may require?—Taxation will be required, but taxation has to be borne when there is a clear-cut object to which it is to be applied.

39,975. You agree with some other witness whom we have heard that we might extend compulsion much more rapidly than we are doing?—Certainly, it ought to be extended. According to the figures I gave you, the Educational Commissioner with the Government of India remarked that it would take forty years to get all these boys to go to the schools.

39,976. In the Punjab we reckon five years. With regard to these village industries, a certain amount of evidence has been placed before us to the effect that one of the main difficulties in the way of promoting village industries is that there is a prejudice against poultry keeping and certain other callings, these callings being regarded as the work of menials, and therefore the ordinary cultivator will not touch them? Do you agree with that?—There is a prejudice against certain kinds of work, but they are not the only kinds of work which should be selected. You have to see which particular kind of work will be suited to different individuals. Poultry-keeping will be resented by certain classes of people.

39,977. Even sericulture?—There are two kinds of sericulture. For instance, that connected with the rearing of cocoons is encouraged; there is no prejudice against that; it is called *muktar*, and the cocoon dies in the process. But in the case of the one in which the cocoon has to be killed, there is a prejudice; but that is a small matter.

39,978. There are difficulties in the way of Government introducing these industries?—What are the difficulties?

39,979. Sentimental ideas and things of that sort?—Where there is any sentiment against a particular industry, that need not be forced upon the people; it should be a matter of choice. There is such a variety of choice available that there should be no difficulty in the way of any particular industry.

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39,980. Then you would like to see industrial schools established. Would you refer us to any example of a successful industrial school in India?—I saw one at Bareilly; there is another at Lucknow and a weaving school at Benares. Both the schools at Lucknow and Benares have got on well. I have not seen the Bareilly school for some years, and I do not know what the condition of that school is now. Then there is one at Gorakhpur. But the system is not satisfactory. You want to create an enthusiasm for this class of schools among the population. If you once do that you will get a large number of students to go to them.

39,981. You hark back again to the old idea of agricultural banks. Could you point to any successful agricultural bank anywhere in the world?—I have read of many successful banks being in existence in Japan.

39,982. Non-co-operative agricultural banks?—They are described as agricultural banks, I think, which give two kinds of credit, the long-term and the short-term credit; long-term credit for purchasing farm land or improving the farms, and short-term credit for purchasing manure, cattle, and so on.

39,983. Are they not co-operative banks?—I do not think that they say they are co-operative banks; at any rate, Japan's latest book does not say that.

39,984. What is your idea? Is it that Government should produce the money for the agricultural banks?—I cannot answer that question. A scheme has to be devised and Government will partly contribute towards it and the people will also put in their money.

39,985. You refer to the Wedderburn scheme. Under that scheme the Government found the money?—Yes, in Japan the Government find the money; the Imperial Bank in India is being assisted by the Government. The Government should certainly help.

39,986. You have devised a scheme according to which the people will be willing to invest their money in the banks. The difference between your agricultural banks and the present *taccavi* system would be that your bank would be under non-official control whereas the *taccavi* loans would be under Government?—Yes, but they will be supervised by Government auditors, to prevent any wrong paths being taken.

39,987. I suppose you know that attempts with the non-co-operative agricultural banks in Europe have mostly failed; the Egyptian one failed?—I am not up to date with information regarding the failure of these banks; but banks have sometimes failed. In this country many banks started during the last 100 years have failed.

39,988. One witness has warned us against the idea of providing agricultural credit by non-co-operative means, such as through the Agricultural Bank of Egypt. I was wondering whether you have had any experience of any agricultural banks on which you base your views?—My point is that you must create agricultural banks in order to make credit available to these cultivators both for long-term as well as short-term purposes; whether you call them agricultural banks or anything else, it does not matter. I have put forward the suggestion of agricultural banks because it is necessary that these agriculturists should be helped to obtain credit whenever they want it. I will give you an instance to illustrate my point. Here in the month of March, the tenants have to pay their rent because the revenue has to be paid on a certain date. They have to borrow money at very high interest in order to pay their rent. The rigidity of the demand for the land revenue is such that they have to borrow the money. If there was a bank which would advance on easy terms the money necessary for the agriculturist to pay the Government rent, it would relieve him to a very great extent. At present he has to

pay a high rate of interest because there is no bank to which he could go. I want that there should be banks provided which will advance money to the agriculturists whenever they need it, on reasonable terms of interest.

39,989. Have you not heard that the Imperial Bank have agreed to give seasonal loans?—That does not even touch the fringe of the problem which I am putting before the Commission. The question is really whether the agriculturists will be willing to borrow money from the Imperial Bank. They have to consider so many circumstances; the agriculturist has to see whether by borrowing from the Imperial Bank, he will be able to tide over his difficulties.

39,990. On the question of pastures, is it your argument that an acre of waste produces more cattle food than an acre of cultivation?—Do you seriously put that question?

39,991. You argue in favour of free pastures?—If you have cultivable land, it is still necessary that you should have pastures in order that the cow may graze there and give you milk. Milk is a perfect food, and if the cow gives you good milk, why should not you have it? You have to pay for the milk in the bazaar; why not pay for it in the shape of good cultivable land? It is only a question of how you pay for it, whether you pay for it in cash or pay for it by reserving good cultivable land for pasture.

39,992. You think that the free pasture land which is so common round about Delhi does give a certain amount of cattle food?—Yes.

39,993. Is that in any way profitable for the cattle?—That is a question to be considered; if the land were cultivated it would certainly produce a large amount of food. The question is, if the land is available for pasture, it should be made available for cattle grazing; and there is a large amount of land available in the country. It is all a question of organisation.

39,994. The evidence which we have had before us so far shows that the pasture land is merely exercising ground: it practically contains no food?—If you want a rose you must grow a plant; if you want to get good grazing grass for your cattle you must cultivate it.

39,995. You have helped to pass through the Assembly the Usurious Loans Act?—Did I?

39,996. Wherever we have been we found that Act a dead letter. Can you explain the reason?—I am sorry you do not remember my speech; I urged the very thing there, namely, that you should supply more credit to the agriculturists on cheap terms; I quoted Sir Daniel Hamilton in that speech, and I also read that portion to-day before the Commission. My contention has been that Government should make cheap credit available to the creditor and they should multiply these co-operative societies and institute agricultural banks in order to make such credit available to the cultivator, who has to pay high rates of interest because he cannot help it. I was never in favour of usury. I consider that no one should be asked to pay more than 6 per cent.

39,997. Why is this Usurious Loans Act such a dead letter?—I have no information about the working of it; you know more about it.

39,998. I am afraid I have put this question everywhere else and I have always drawn a blank answer?—The unfortunate part of the thing is that the reports are not circulated to us; unless they are published and the people are in a position to make a special study of the question they will not be able to give you any useful information.

39,999. *Mr. Kamat*: While describing the condition of the peasant a little while ago, you said that he had no clothes to wear and not enough *Pandit Madan Mohan Malaviya*.

food, and you drew the inference that probably the land revenue system was responsible for all this?—Yes.

40,000. On the other hand, we have been told that perhaps the outturn per acre of recent years has not gone down and the prices which the peasant is getting owing to the world factors have gone up, with the result that, although he gets the money for his needs, he does not know how to spend it?—Has he not to buy? Has he merely to sell?

-40,001. I am just asking for your view in the matter? If he is getting more money for his crops now than he used to get, what is he doing with it?—The prices have gone up, and while he gets a higher price for his commodities, there are other commodities which he has to buy and for which he has to pay equally high prices, so that the residue which is left to him is not enough to maintain him and his family. Is it conceivable that any human being would not give himself and his wife and children sufficient food and clothing if he had the means to do so? I have found a lot of people with sunken eyes, emaciated bodies, people looking dreadfully poverty-stricken, and their physical condition is such that they are readily susceptible to disease. I cannot imagine for a moment that such people deny themselves all these little necessities simply for the fun of it.

40,002. That is just the point, namely, whether the so-called extra money that goes into their hands is wasted on unnecessary things?—If that is suggested by any one it is an absolutely unjustifiable libel upon these poor cultivators. They are not given to drink, they do not drink tea, or supply themselves with other luxuries. They hardly have a square meal in 24 hours; on the other hand, if they had had a little extra money, they would immediately supply themselves with the pressing necessities of life. To suggest that they waste their money is a distinct libel on these poor people.

40,003. *Professor Gangulee*: Do they spend any money on jewellery?—Yes, they do buy some jewellery when they have a little money; that is their only savings bank.

40,004. We saw a jeweller's shop right inside the market at Akola and we were told that whenever a cultivator obtained a little extra money out of his sales he forthwith invested it in jewellery?—Thank God that they do it; the habit has come down to them, otherwise they would be nowhere. During times of famine, of scarcity, they fall back upon this jewellery by pawning it and thus saving themselves from starvation and death.

40,005. *Mr. Kamat*: Is it also true that the peasant makes litigation a habit and therefore he is ruined?—That is another libel against him. A vakil who came to me from Lucknow said that he had instituted a case against a tenant on behalf of a talukdar. The tenant had to appear on so many occasions that from utter despair he gave up the fight by going to the Raja and saying that he would not go on with this litigation and that he would accept whatever the Raja said. This shows that these poor people are simply driven to litigation much against their will.

40,006. I suppose they are ruined through the long delays occasioned in the court?—Not merely delays in the court. The cultivator goes to the court only when he is driven to it. Of course, there may be one or two cases here and there in which they go to the court, but taking the tenants as a body, I do not think that they are fond of litigation.

40,007. You were a Member of the Industrial Commission. I should like to have your opinion on one point. You know that 70 per cent. of the population in India is engaged in agriculture and the pressure on the land is heavy. Would you like that a large portion of this population

should go into manufacturing industries?—Unless it does there is no future for India. Up to the middle of the last century Indians used to produce a large number of manufactures. Those manufactures ceased when we began to export the raw produce, and also because imports began to come into the country in large quantities. That is why these famines began to occur, and I have referred to this aspect of the question in my note. The same was the case in Ireland.

40,008. If this industrialism goes on, what will happen to the agricultural wages and agricultural industries?—If you mean to suggest that wages will rise, then I heartily agree, because the agricultural labourer is not getting sufficient at present; if the cultivator gets a little more for his labour then it is all the better for him. If the manufactures grow, the national average income will also grow.

40,009. Side by side with the improvement of agriculture you therefore want industrialisation of the country?—That is absolutely necessary. You will kindly note the recommendations of the Famine Commission of 1880, as they are very valuable. They found that one of the causes for the masses not being able to withstand the famine was that agriculture was the only occupation on which they could depend and they recommended the introduction of industries as the one remedy necessary for their salvation.

40,010. *Professor Gangulee*: There is an excessive pressure on the cultivated land?—Yes.

40,011. *Mr. Kamat*: With regard to the question of the dairying industry, we have been told that in this country animals which are old and unfit are allowed to live on pastures and thereby they consume the food which is necessary for the better type of animals, and further that that is perhaps one of the reasons why the dairy industry does not prosper and cattle improvement is also not possible. You know the prejudice and sentiment which exists in this country against the slaughter of animals. In view of that fact, is there any solution of this difficulty?—There is a great deal of ignorance on this subject. The cow calves up to the last year of her existence I am told. She goes on producing a calf year after year and if she does not give you milk she gives you a calf, which is of great value; and if she lives upon the land and grazes she gives you manure for the land; and lastly, when she dies she leaves you her hide. The man whose children have drunk of her milk should be grateful to the cow and should look after her and not send her to the butcher.

40,012. So that whatever schemes of cattle improvement or dairy work are proposed, this sentiment will have to be reckoned with?—Let me give you an instance. A small blind cow was sold to the butcher and a *brahmachari* in Benares, having seen it with the butcher, purchased it for Rs.4. It was a very small cow, and that very cow has produced two calves, both of them very powerful bulls. The younger one fights a big bull in the *gowshala*, and whenever he is able to do so he runs away, leaving the people a difficult task to get hold of him. A cow which may not be able to produce much good milk may yet produce good calves; therefore before destroying the cow all those facts should be considered and appreciated. If a cow is put to graze on a particular piece of land she will enrich the land to some extent. I am willing that she should be put to the yoke in order to plough the land to grow the grass that she has to feed upon. There are various ways of dealing with the question, and to allow the cow to go to the slaughter-house is, I submit, a very ungrateful act on the part of man.

40,013. Another matter for which we are searching a solution and which is intimately connected with the habits of the people is the question of burning cowdung cakes?—I have always regretted that cowdung should be

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used as fuel; I wish with all my heart that we could teach the people to avoid using cowdung as a fuel and to use it as manure; but sufficient propaganda has not been done and there are certain difficulties that stand in the way. People do not use cowdung cakes when they can get other fuel; the remedy to my mind lies in offering a good price for the cowdung and also making cheap fuel available to the people. If those two things are worked together, I think we can prevent a great deal of this manure from being burned.

40,014. How can you cheapen fuel: by planting trees on waste lands?—Planting trees and letting the forest lands for this purpose; the Government ought to be willing to take less from the forests than at present. After all, the forests exist for the people, and the forests ought to be used to supply cheap fuel. Sir Ganga Ram proposed a great scheme for the supply of food, fodder and fuel; some years ago he suggested that scheme to the then Member for Revenue of the Government of India; that was before this Commission was thought of. Unfortunately that scheme was not then sufficiently appreciated; I hope this Commission will consider the question. There is plenty of land where grass can be grown, and there is plenty of land upon which you can grow timber for fuel.

40,015. *Sir Ganga Ram*: Do you mean outside the village? Where is this land?—In the forests, in the jungles. I think it is a pity that this fuel has become so dear; in some places in the hills, and particularly in the Himalayas, people complain bitterly of not being able to get sufficient fuel. I know that in that cold climate, people are exposed to great hardship and suffering from want of sufficient fuel.

40,016. *Professor Gangulee*: What about the villages situated at a distance from the forest areas?—That is a matter of arrangement; it can be arranged.

40,017. There is the cost of transport?—But all that is a matter of arrangement. I hope Sir Ganga Ram will put his scheme before the Commission.

40,018. *Mr. Calvert*: Did you use the word "forests" in the sense of Government forests, or in the sense of jungles?—In the sense of Government forests and jungles.

40,019. Were you referring to the plains where there are no forests?—I was referring to the Government forests primarily; I think the forest rules require to be relaxed in order to let the people have more fuel than they are able to get at present.

40,020. You were not thinking the plains of the Punjab and the United Provinces?—No, but where there are jungles they should be utilised for producing cheaper fuel; it is possible to arrange that where there are jungles. Then there are all these roadsides all over the country; it is all a question of organisation by the Government.

40,021. *Mr. Kamat*: You have emphasised the necessity of rural uplift and rural reconstruction in the villages; could the work of educating the villagers to live a good life be done by Government agency or by non-official agency or by both together?—Both together; there should be no question of this work being official or non-official; I consider that it is God's own work, and I think every man and woman who has any feeling of humanity ought to co-operate in this work.

40,022. *Sir Ganga Ram*: You have been giving a very good sermon as to the state of the tenants and so on, but may I bring to your notice one thing that I have myself observed: in Patna I visited a village of a Raja who was charging Rs.15 an acre to the tenants and was paying Government three annas; why did you not have the courage to lecture on that subject.

with a view to abolishing the Permanent Settlement in the interests of the tenants?—I am not guilty of want of courage if I do not advocate every good thing in this world; if there were an occasion to vote on it after a discussion in the Legislative Assembly and I do not do so, then I should be liable to censure by you.

40,023. You said just now that the tenants are left nothing?—I did not say they are left nothing.

40,024. Well, very little indeed, and naturally on that calculation they would be left nothing?—I may say at once I am not in favour of the tenants being fleeced, whether by Government officials or by zamindars; I want both the Government and the zamindars to be more considerate towards their tenants than, unfortunately, they are.

40,025. That is the propaganda I want you to take up?—Most certainly.

40,026. Have you been exercising your influence with the big landlords of the United Provinces to make them more considerate to the tenants?—Yes; I wish I could produce them before you and ask you to question them. I have everywhere said to zamindars, and I said it even during the last elections: "If you want to work with me you must agree to be fair to the tenant; you must agree to give him his due and I will advise the tenant to give you your due." I have said it again and again, not only this year but for many years past.

40,027. There is one very important thing we are doing in the Canal Colonies; all landlords are building sanitary houses and supplying pure water to their tenants?—Yes.

40,028. Have you ever suggested that to your landlords?—I have not suggested it because I have not had occasion to, but some landlords have done so.

40,029. In the United Provinces?—In some places.

40,030. We have been told that none has done it?—Very few have, but the point is that I entirely agree with you in regretting that, generally speaking, the idea of building houses for the accommodation of tenants is not prevalent amongst the zamindars; but many of them treat their tenants with consideration and extend the help that is needed, help such as you, for instance, give your tenants. That is the right measure of help and I wish everybody would do the same.

40,031. In your University have you introduced agriculture as an optional subject for the degree of Bachelor of Arts?—Not yet because we have not got the staff to teach it.

40,032. You are going to?—Yes, I am very anxious to do so.

40,033. Without considering whether he is going to join the Agricultural College or not? I mean it should be optional and treated as being equal to botany, zoology and such subjects?—Quite so; I think agriculture should in no way be regarded as an inferior subject as compared with any of these other subjects; it should be treated as of equal value to encourage students to take it up. If students take up agriculture I think they will find it more useful in after life than some of the subjects which they now undertake and which they afterwards forget.

40,034. *Sir Thomas Middleton*: I think you have in view the immediate starting of post-graduate agricultural research in Benares University?—We can only do that when we have started the College of Agriculture. We are carrying on some post-graduate agricultural research at present, for instance, in erosion, plant physiology, questions of respiration, and as to how much water and air a plant absorbs and under what conditions; these questions are being investigated as pure science questions; but we want to establish a College of Agriculture and then to provide for research beyond the graduation stage in a special manner.

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40,035. Even before the College of Agriculture is established, is there not much that you could do in the direction in which you have already begun?—Yes, there is.

40,036. You have got your Professor of Plant Physiology and he must find many agricultural problems on which he can work?—Yes, he is dealing with some at present. In a few months one of our students is sending up a thesis on research which he has been carrying on for three years.

40,037. What funds have you at your disposal for assisting that class of post-graduate study?—Unfortunately we are very much handicapped for want of funds; we have not got enough money. We have applied to the Government of India for help, but we have not got sufficient help yet; we have again applied and we have applied to the United Provinces Government, which gives 7 to 8 lakhs to the Allahabad University and the same amount every year to the Lucknow University. The Government of India give Aligarh University 1½ lakhs a year while they only gave us a lakh when the University was started and we had only three Faculties; now we have added many Faculties, but our grant has not been increased beyond Rs.25,000 sanctioned for two years. You can imagine what is the position of our staff when we only receive 1 lakh while other Universities receive so much more. Our staff is working on salaries 25 per cent. lower than those of other Universities, and our staff are working longer hours.

40,038. What are you able to pay your young assistants in your research laboratories, for instance?—Do you mean by way of scholarships or stipends?

40,039. By way of stipends?—I have paid some Rs.30 a month which they were thankful to receive because we could not pay them any more; they were students who had just passed the M.Sc. examination and wanted to carry on for some time. We started paying them Rs.75 per month, but our funds have not permitted us to continue to do so. We should like to pay them Rs.100 a month; if I could do that I could attract a number of Masters of Science to our research work.

40,040. For how long would young men of that class who have taken their degree of Master of Science continue to be satisfied with salaries of Rs.75 to Rs.100 a month if engaged on research?—They would carry on for three or four years, until they had taken their Doctorate, and then they would expect to be paid Rs.300 a month. We put them into the Rs.300 a month grade when they have taken their Doctorates; they are then paid from Rs.300 to Rs.500 by increments of Rs.25.

40,041. What is the salary of a full Science Professor of the University?—We pay the Principal of the College of Engineering Rs. 1,500 a month, while the Vice-Principal is paid Rs.1,000 a month rising from Rs.750, whereas in other Universities the salaries go beyond Rs.1,000 and Rs.1,200.

40,042. What is the pay of the men in the stage below that of full professor; I suppose you call them lecturers?—Yes; they receive from Rs.300 to Rs.500 a month; that is the next grade.

40,043. And I suppose nearly all of these men have taken the degree of Doctor?—Some of them, not all.

40,044. I am thinking of science men now?—We have two gentlemen who have taken their degree of Doctor in Germany; they are in that grade at present; and we have one gentleman who is from our own University; he has taken his degree in Calcutta; he is in the Rs.200 to Rs.300 grade. The others are Assistant Professors in the Rs.150 to Rs.300 grade. Those rates of pay are lower than those of any other University in India.

40,045. We were much interested in what we saw at Benares and we carried away in our minds one motto which we saw chalked up on a laboratory wall: "Research consists of 10 per cent. inspiration and 90 per cent. perspiration." I have been wondering in what degree that excellent

combination is remunerated by you at Benares?—The remuneration we could offer was so small that one of our best Professors had to leave Benares to come to Lahore; he was getting Rs.600 a month and Lahore University offered him Rs.1,200 to Rs.1,500; he asked my permission to go and I had not the heart to tell him not to go; I had to agree to it.

40,046. In view of the difficulty of getting funds to pay the men you have, would it not be desirable, when more funds become available, that the first expansion should be in the direction of assisting these post-graduate workers rather than setting up a full fledged College of Agriculture which would be an expensive undertaking?—It will be expensive but it will repay a thousand-fold; I consider that every pie spent on the promotion of agriculture is money very well invested.

40,047. I grant that, but I am thinking of your particular difficulty, namely, the difficulty of retaining your best students as research workers?—That is a question of how much funds we can get from the Government and the public. These research workers give their value in return to the country for any assistance they receive.

40,048. They do; my point is that they are likely to give a much greater return than you are likely to get from your agricultural graduates when you turn them out?—But there are two kinds of work that we have in mind: one is to help the farmers by experimental farming, the other is higher research work; we want to produce men of both types.

40,049. If you take up the first type of work to which you refer in order to help farmers, this will involve the setting up an agricultural college with, I suppose, a four years' course?—Yes, three to four years.

40,050. Your practical difficulty will be that you will get into that college young men of good education but with very little knowledge of agriculture, so that they will not only have to get their literary and scientific training from you but they will have to get from you their practical training. I ask myself this question: are you going to be able in four years to give them the scientific training that you aim at and also the practical training that will enable them to go out among the farmers and become real leaders among the farmers?—That is a question of selection; I feel that selection can be so made that students who have an aptitude for agriculture or have got farms might come in large numbers to the agricultural college.

40,051. Experience in other countries where the students are in closer touch with agriculture than they are on the average in India seems to indicate that to get men of that class you must have a longer period of training than three or four years?—That is why I say that the training should begin in the high schools. In the elementary schools we cannot give instruction in agriculture; but in the middle and high schools there should be a course in agriculture so that when they go up to the college they will have sufficient training in the subject.

40,052. The training which is so difficult to get is the training in practical methods; that cannot be given in a high school. For that you must depend in this country upon well founded farms?—There should be some schools in which such training should be given. In the central school attached to the Benares Hindu University, we have given little plots to the students to attend to, and they take really good interest in them. If I had a larger plot available, I would give them half an acre or an acre each and encourage them to cultivate.

40,053. I am not now questioning your policy or aims. What I am asking myself is whether, with the opportunities you have of developing this post-graduate work at Benares, it is wise to attempt at an early stage to found an Agricultural College?—Unless we have a College we shall not be

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able to attract a sufficient number of young men to this work. I feel that the need for this work is growing and therefore we should have a College where we can attract a large number of young men and some will turn out to be good researchers.

40,054. You attract for your degrees in science men who take chemistry, botany, physiology and so on. Could you not select from among these students men who will make good and efficient workers in agriculture?—They are deficient in that very previous knowledge of agriculture which you have been referring to.

40,055. I was thinking of training them as laboratory workers, not as workers to go among the farmers?—Their interest should be enlisted at an early stage and that will be secured by admitting them to the agricultural college and allowing them to undergo a three or four years' course.

40,056. Sir James MacKenna has indicated the difficulty there is finding posts for these agricultural college men?—If at any time my wishes and prayers fructify and agriculture becomes a subject of living importance to the country, there will be plenty of work found for these agriculturists. There are more lawyers being created to-day than is necessary. I want to turn a large proportion of these young men on to agriculture and they will be much happier than many of these lawyers are at the bar to-day.

40,057. That we may agree to. But we have had a great deal of evidence to indicate that the Indian agriculturist, although, as you say he is looked down upon by his fellow men, knows a very great deal and he looks very carefully into the quality of advice that he gets from the college graduate?—You are thinking of the college graduate who is produced now in some of the colleges and our complaint is that the system is not satisfactory. We want to make it satisfactory to the people so that the college graduate will be as suitable to serve an agriculturist on his farm as, for instance, a college graduate of electrical engineering is fit to take up electrical engineering work. We want to give him that special training.

40,058. The difficulty is that the electrical engineer can get his technical training very rapidly. The work goes on in every day of the year and he learns quickly and gets experience quickly. The agriculturist, on the other hand, gets his experience only one or twice in a season and therefore his training, in order to make it valuable, must be much longer; it is a much more difficult matter to train your agriculturist; the difficulty exists all over the world, the difficulty, namely of converting urban classes who have no knowledge of agriculture into practical agriculturists?—That is true, but unless we endeavour to enlist a large number of young men into colleges of agriculture, agriculture will not make that progress which we desire.

40,059. The great demand at present is rather for the men whom you refer to as being of the lower or diploma standard?—Yes.

40,060. Who can go out as demonstrators and gain their experience actually in the fields?—Yes, but the other man is also needed. Unless the graduate is also available, the system will not receive that fair trial which I wish.

40,061. There are many colleges at the present time which are giving the type of education which you are thinking of. Take Poona for example. Do you not think that the colleges in existence supply a sufficient number of places for the students who wish to get this kind of training?—The college existing in Poona will serve the area round Poona and a college existing in the Punjab will serve a small area round it. But the Provinces are very extensive. They are like the countries of Europe and you want at least one good agricultural college for each which will be popular and which will attract students in order that agriculture should receive a fair measure of attention.

40,062. In your case you have got a college in Cawnpore?—Unfortunately that college has not proved to be satisfactory. It has done good work as a farm, but for training men with a knowledge of agriculture and with an enthusiasm for agriculture, it has not been very successful.

40,063. Do you see a way of improving it?—Certainly. I want to put it on a basis in which the interests of the zamindars and the tenants will be enlisted; that is the great point which I have before my mind.

40,064. Has your University given any thought to the provision of literature suitable for villagers?—We are just at present in the tenth year of our life; the University began its work in October, 1917, and these ten years or less than ten years we had to lay down every brick on that site which you have been good enough to visit. We had to equip every Department. We have yet had no time to do extension work. We have it in our scheme, but we have not yet had the time for doing it.

40,065. I am not thinking of extension work. I was wondering whether any of the members of your staff are considering the preparation of such books for agriculturists?—We have asked them to prepare literature in the vernacular for teaching some of the subjects in the intermediate classes for the present, and they are busy with that work.

40,066. It has been frequently represented to us that one of the great difficulties in securing literacy in India is the fact that the village boy when he leaves the school has no suitable literature to read?—There is one book in this part of the country which supplies him all the literature and that is the Ramayan of Tulsidas. If a boy has learnt the three R's and if he gets a copy of the book which has been described as the Bible of 90 millions of the people, probably an under-estimate, he will be quite happy.

40,067. Does he read it?—He does; in the villages they do. If they could have that much of education, that they could read and write and cast up small sums and read the Ramayan, that would change them very much.

40,068. You have given us a depressing picture of the condition of the cultivator in many districts. I think you refer chiefly to the United Provinces and Bihar. Do you think that this condition is largely due to the fact that he has too small an area on which to live?—That is his misfortune, not his fault.

40,069. I ask you whether it is due to that fact?—Yes, partly; it is because of his suffering.

40,070. Do you know the average area of the holding in the United Provinces?—I know it is very small in some places.

40,071. Have you given any attention to the question of the size of the holdings?—I am very much in favour of the consolidation of holdings, and that depends upon the education that you give to the people.

40,072. *Professor Gangulee*: Would you have that by legislation?—No; by co-operation and voluntary methods.

40,073. *Sir Ganga Ram*: Is that possible?—At this stage I do not suggest legislation.

40,074. *Sir Thomas Middleton*: If consolidation could be effected it would be useful, but it would not affect the difficulty that arises from sub-division under inheritance?—That is true; that will have to be provided for and got over; but the first thing is to educate them about the advantages of it. At present the villager is taken aback entirely by a proposal like that. Propaganda work has to be done in order to make that idea acceptable to the people.

(The witness withdrew.)

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**RAO SAHIB RAO ABDUL HAMEED KHAN OF KAIRI,
District, Muzaffarnagar.**

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (i) As in other branches of scientific knowledge, the spirit of research is always to be encouraged, as the guiding star of all agricultural activities. The department will be in the dignified position of meeting the demands of the advanced sections and the pioneers of agricultural movement. For the mass of cultivators, the department should always be in a position to give practicable suggestions. The research work should be conducted under the supervision of the transferred half of the Local Government. The Central Government should financially aid these activities and further give efficient technical help by appointing a Commissioner of Agriculture with expert staff to see that proper use is made of the help advanced; the new officer may be treated similar to the Educational Commissioner of the Central Government.

(ii) Veterinary research, so far as my observation goes does not very much differ in various Provinces and should be conducted by the Central Government. In this particular direction I emphasise the diet of animals, with a view to thorough scientific analysis of the various articles of fodder and nutrition.

QUESTION 2.—AGRICULTURAL EDUCATION.—I am particularly interested in the two years' course in agricultural education. Such institutions, for which the demand is daily growing, I regret are few and far between in this Province. The Bulandshahr and Cawnpore institution cannot supply the needs of the millions of cultivators in this Province. I suggest that every Division should be provided at least with one institution of this type and I have great faith in them. The teachers and students both should be drawn from the rural classes and I note with satisfaction that Bulandshahr school at least has successfully kept up the view. This will lead to uprooting the idea of Government service after such education, if any, and the education so imparted will be employed for the betterment of the vocation of the tenant class. Nothing stimulates such education as the experimental plot of land provided for the students. My only objection is that such plots are too small. Greater area should be provided for such work in future in such schools. The vernacular middle schools which at present satisfy neither those thirsty for knowledge nor the stomach of poor should be made more useful by providing in the curriculum, elementary agriculture as a vocation and as a feeder for two years' course schools. It is a pity that the literary education said to be imparted in these schools absorbs the lion's share of the budget without contributing anything towards agricultural improvement. I am strongly of opinion that the suggested introduction of agricultural education in middle and primary schools should be financed by the Education Department and supervised by the Agricultural Department. The middle and primary schools so far are a huge expensive luxury. A bare text book education of agriculture would not suffice. I therefore suggest that small farms and fruit growing plots should be provided. All this of course should be introduced gradually to suit the provincial budget. Last, but not least, I suggest that a course of seasonal lectures on agriculture should be organised in every Division or district to attract the youth of the middle classes, whenever they are free from agricultural activities. I submit that this will solve the agricultural problem a great deal in this country.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—I believe demonstration farms and seed distribution are the two tangible steps that have led to the popularity of scientific agriculture in some measure.

I think the utility of Government farms is seriously curtailed by the new Councils trying to commercialise them. So far as I know, the idea of progressive experiment is suffering from the strictures placed on the farms and the desire to turn them into a profitable enterprise. I fully approve and appreciate the idea of locating small farms in the centre of a group of villages so as to be easily accessible to all. The purpose would be best served by supervising the private farms and helping or encouraging them on a selective basis, not unlike the idea of granting Government aid and affiliation to private educational institutions on their good work with similar restrictions. What I gather from a purely Government farm is that to a village it is a superstructure and perhaps a costly museum. The idea of infusing reform cannot be developed except by a private farm.

I hope the Commission is fully cognisant of the conservative character of the masses and the persistent nature of this conservatism. It is a parasite which is considered a panacea. The situation is a tragic one, the nature of educative work is arduous, even Herculean. I therefore suggest that the office and the duties of the Directors and the Deputy Directors of Agriculture should be considered from an educative point of view. They should be touring officers going about in the country and mixing with the masses, as the high Canal Department Officers do in their seasonal tours. I insist on the Director and Deputy Directors doing so, because I am fully convinced that the subordinate and junior officers neither command the confidence nor the respect of the masses. The great success of the Government horse-breeding campaign depended mainly on this one point. The idea is useful also for more purposes than one. The exploitation of the masses for political purposes, which is not a little helped by the isolation of the senior officers, will be greatly minimised and the officers also learn more to sympathise with the masses and will daily equip themselves better by practical experience in serving them.

QUESTION 4.—ADMINISTRATION.—Considering the percentage of agriculturist population, I cannot understand the paucity of staff in the Agriculture Department. Does the Government sincerely think that one Inspector of Agriculture suffices for the agricultural needs of a whole district? More staff thus is the first necessity. I think no department is more ill-supplied with employees. The slight awakening which the sprinkle of elementary education has created has led the young agriculturist to consider the awful disparity between the Government income from rural areas and the expenditure on their improvement. He is not a little grieved to find his wealth being robbed to beautify the towns and the cities. Before this latent evil takes horrible proportions and develops into a relentless class war, the Government should realise the possibilities of such an attitude.

The means of communication and transport and the people responsible for them are being subordinated to the needs of the urban gentry and the executive. They may connect big and small towns, but the agricultural point of view is completely lost sight of.

QUESTION 5.—FINANCE.—The Agricultural and the Co-operative Departments co-ordinated can go a great way to solve the difficulty. The rate of *taccavi* interest should be lowered and the Agricultural Department should popularise the *taccavi* loans.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—Indebtedness is a normal condition of the agriculturist. The tenant has a family deity and a family moneylender. He is reconciled to the tyranny because he thinks the Government has neither the inclination nor the will to rescue him. The money-lending class is a hierarchy with age-long traditions of parasitism and the callous instincts of a blood-sucker. The family contracts a debt which simply cannot be paid off. The hydra-headed monster of exorbitant rates, compound interest, clever manipulations, double payment notes with multiple

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rates of interest, are all the clever threads of a spider web which a tiny fly simply cannot escape. The majority of small cultivators are but the labourers of a moneyholder, the whole harvest is generally given on to him to reduce debts at a ridiculous rate. They labour for him, perhaps drag on a weary life in the impossible attempt to pay off an old debt. If the labours of the Commission were to result in relieving them in this one direction, I think they would rightly consider themselves amply compensated.

I think, apart from some old marriage customs, the main causes are the recurring deaths of animals, the money compensation for a bride, the exorbitant cost of litigation and the process of justice and the extortions of police and petty officers.

I press that a law similar to the Borrowers' Protection Bill of Punjab should be immediately enacted, the Usurious Loans Act enforced with all possible vigour, and compounding of the cases outside the court by means of the *panchayat* or otherwise should be encouraged. If for the professional moneylender the Government substitutes the system of *taccavi* or agricultural co-operative banks, they can understand and appreciate it as a measure of Swaraj.

So far the Government has wrongly diagnosed the disease of the tenant by considering the landowner responsible for his misfortune, and the remedies thus suggested have proved ineffective. The real disease is that the moneylender has cleverly evaded his well merited punishment. I fear that the people have often consoled themselves by considering the masses as dumb driven automatons. My experience as one of them is that the tenants are fully conscious and groaning under the weight of the moneylender. They are indignant and feel outraged against this class and against the Government in leniently treating them. They have sometimes not a little sighed for a Swaraj when, without the Government, they would be at liberty to give the moneylender a return blow.

To safeguard the interests of the agriculturist by law, the Government should take at least those measures which the Punjab Government has taken, by passing the Land Alienation Act.

QUESTION 8.—IRRIGATION.—The canal system may be and is capable of expansion, but does not and cannot satisfy the needs of all parts of this country. We should adopt the modern methods of drawing water out of land, *e.g.*, by tube wells. What the United Provinces Agricultural Department has done in the direction cannot be overestimated. But we have to cheapen the modern machinery of drawing water and devise a very cheap and practical instrument. It is a new subject for research, and much depends on finding a suitable remedy for it.

QUESTION 10.—FERTILISERS.—I fear nobody in my Province is competent to deal with the question at first hand, because no experiment in any appreciable degree has been made in this direction. But I recognise the necessity of providing the necessary apparatus to examine the soil and suggest the manures in district farms within the reach of cultivators. Fraudulent adulteration of fertilisers may be checked by an enactment. I think the methods for improved seed should be adopted to popularise the fertilisers also.

QUESTION 11.—CROPS.—The wheat produced in my Province is not so good in quantity as it can be. We should advertise the results of the Lyallpur experiments or take some other step to consider our possibilities in this direction. Similar is the case with cotton. We should devote greater attention towards oilseeds because they are more paying.

QUESTION 14.—IMPLEMENTS.—The popularity of machinery can be pushed further, if the department can spare men or employ others to go round the countryside and demonstrate the use of modern implements and sell them

on credit. The advertisement of Singer and other sewing machines is an example in point.

QUESTION 15.—VETERINARY.—The ridiculously few men employed for the Veterinary Department are responsible for the frequent diseases amongst the animals. Millions of animals die annually, and those that live are no better. Efficient expert advice available to every peasant is the only remedy. Veterinary dispensaries should be increased in number and the administration should be taken over from the Local Boards. I know of hundreds of deaths of animals that were never brought to the notice of the department, thanks to the rule which leaves such reports to be made by the *patwaris* owing to the paucity of employees.

(d) Yes, I do agree to such legislation.

QUESTION 16.—ANIMAL HUSBANDRY.—In regard to cattle breeding, I think the United Provinces Government has paid no attention to goat and sheep breeding. The general census also shows a decrease in the direction, although this one improvement will go a great way in solving the great problem of cow sacrifice, would provide excellent food stuff and a means of living to many. It is also useful in other directions. A special sum should be allotted in the Provincial Budget for it. I very much appreciate the idea of patronising and encouraging milk supplying agencies introduced by the Government of this Province and expect very good results from it. In my locality fodder is not an acute question.

QUESTION 23.—GENERAL EDUCATION.—The Government should make a particular note that the revenue and police employees that come in contact with the masses of agriculturists should be intellectually well equipped to understand and sympathise with their needs and be able to give practical suggestions for the betterment of their general life. The training schools at Moradabad should provide a course of instruction wherewith the students should be able to understand the agriculturist point of view and their needs. A regular subject on these lines should be included in all competitive examinations where possible. Boys coming out of Cawnpore and Bulandshahr should have openings in Government service and not be debarred on account of their agricultural qualifications. With regard to the general education and culture of the agriculturists, the District Boards should organize night schools in the villages for adults. The department should organize magic lantern lectures, which will go a great deal in attracting agriculturists and liberalise and widen their outlook. Without religious and vocational studies, compulsory education, I think, is wholly unacceptable to the masses and will not result in any good to the rural areas.

The primary reason for the small percentage of boys is the purely literary character of the education. There are a few offices in a village which require a little education: those of the Headman, *pandit*, *maulvi* and *patwari*. Letter writing or reading over the counterfoils is enough for them. The villagers do not find any use for the present education. It, moreover, spoils a youth and makes him less hard working and expensive.

QUESTION 24.—ATTRACTING CAPITAL.—(a) I am afraid I will be exceeding the limits of the terms of reference of the Commission in doing justice to this very important problem. The only class that can spend wealth successfully on this enterprise and really utilise it is the landowning class. Individual farmers may improve the situation, but not appreciably. At any rate their efforts would not result in turning it into a national wealth on any big scale.

The Government therefore should, in the first place, make a clear distinction between the landholders who reside in the city and those that habitually live in their villages and encourage the latter. They should be encouraged in starting the farms, and all facilities should be provided in

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acquiring land for their own cultivation which has been cruelly almost denied to them by the present Tenancy Act. This would not deprive the majority of tenants of their holdings, but even if it does in some cases it will be a distinct improvement on the present position, as such tenants will serve as labourers on the fields of their zamindars. Even if the conscience of the radical reformer be not satisfied, the material position of the tenant would be far more improved under the new arrangement. To take an instance in point, the labourer at the tea garden or in a large scale enterprise as the Tatas is in a better position than one on a small holding. Under the present unfortunate circumstances, the position of the tenant in relation to the moneylender is no better than that of a labourer, as I have previously pointed out. The new change at its worst would not worsen his lot. I think the relation of a landholder towards the tenant is by tradition one of guide, philosopher and friend. The profits in that case will depend on the more efficient labour of the tenant, which naturally means greater comfort and better health for the tenant himself. This will lead to greater interdependence of both the classes and keep both engaged; otherwise it can only lead to greater discontent among the tenant and a spirit of sloth amongst the landowners, which is a demoralising influence from the point of view of the country.

(b) 1. The main cause in some cases that deters improvement is the basis of cash rent. The zamindar, as long as he gets the cash payment, has no worry about improvement. As long as that continues, the relation cannot advance beyond sordid commercialism. This form of renting should in future be considered criminal and stopped at once; on the other hand there should be substituted the system of rent on the basis of grain which alone can unite them and make both solicitors of mutual interest. The system is prevalent in some parts of the Punjab, and its result shows a remarkable improvement in agricultural conditions. The rent, if paid in kind according to the harvest, will enlist the interest of the zamindar to see that the land and its produce improve.

2. The attitude of the Government in every country means much; in this country it means everything. We have an almost slavish mentality and independent initiative to us is still foreign. The encouragement and discouragement of the Government means to us a great deal. If the distinctions, titles, *sanads* were to be given on the basis of improving the condition of agriculture, the animals and the tenants, a decade would see the country side flowing with milk and honey. The Government, for the upkeep of law and order, awards and encourages all those who help it in maintaining it. Were it equally to value the agricultural improvement and award distinction for it, it would be setting a tone to the country. This would further give dignity to the distinction and associate the landlords with real social work. This was the attitude adopted towards the pioneers of the Western education movement.

I therefore suggest that it should be the considered policy of the Government to award a great number of distinctions on the consideration of improvement in the condition of agriculture.

3. The Central Government should organize an all-India agricultural association on the lines of the National Horse Breeding Society under the patronage of His Excellency the Viceroy, the Commander-in-Chief, the Ruling Chiefs and the prominent men of the country, with the Agricultural Commissioner of the Government of India as its Secretary. This association should organize an annual agricultural exhibition for the best produce at Delhi and infuse a healthy sense of competition among Provinces.

The Provinces also should organize branch associations in every district on similar lines. This association should publish a magazine in Hindustani on the lines of the National Horse Breeding Magazine.

This reply also covers the reply to Question 25 (a).

Oral Evidence.

40,075. *Sir Henry Lawrence*: Rao Sahib Rao Abdul Hameed Khan, we did not receive your note till this afternoon, and we are not fully acquainted with it. What is the main point to which you wish to draw our attention?—I should like to mention that in my Province, the Director and Deputy Directors of Agriculture do not go out on tour in rural areas so frequently as I think they should. I think they should be essentially touring officers and go about in rural areas in the same way as the Chief Engineer does in canal areas, so that the people may have first-hand information and come in contact with the superior officers of the department.

40,076. That is a very good point. Has the Director ever visited Muzaffarnagar?—Not to my knowledge; if he comes he only visits the district farm; he does not go out to rural areas.

40,077. Have you got lands in Muzaffarnagar District?—Yes.

40,078. You cultivate your own land?—Yes, I am starting a very big farm; my tube well is under construction, and it will be ready, I think, by the end of this month.

40,079. Have you had any assistance or advice from an officer of the Agricultural Department?—All that I needed.

40,080. You have received advice and assistance?—Yes.

40,081. From whom?—From the Director and from the Agricultural Engineer. I have been given a grant of Rs.5,000 on a seed contract, and all the advice I required.

40,082. On page 739 you speak of the tyranny of moneylenders and the improper leniency of Government towards moneylenders, and you say that whereas it is supposed that the zamindars are the cause of the troubles of the ryot, in fact it is not the zamindar but the moneylender?—Yes.

40,083. What remedy do you propose?—I think legislation might be passed on the lines of the Borrowers' Protection Bill in the Punjab.

Mr. Calvert: That Bill passed the Punjab Council, but was disallowed by the Governor; it began as a Moneylenders' Registration Bill, then it was called the Borrowers' Protection Bill, and it was finally passed as the Moneylenders' Accounts Bill, I think.

40,084. *Sir Henry Lawrence*: It is for the registration of the moneylenders, is it?—Yes, and to control them so that they may be required to keep accounts.

40,085. *Mr. Calvert*: To keep accounts in properly paged books and to give copies to the borrower?—Yes, just as we zamindars are required to give receipts to our tenants.

40,086. *Sir Henry Lawrence*: Have you studied that Bill?—No, I have not; I have heard of it and read in the papers about it.

40,087. And you think a Bill of that character would be of use in your Province?—Yes, just as Government has tried to save tenants from the tyranny of the zamindars, for which I think there was no need; such attention might be devoted to moneylenders.

40,088. Then I see that on page 740 you say you wish to see some encouragement given to landholders to reside on their lands?—Yes, I want the Government to encourage those zamindars who reside usually in their villages.

40,089. Is there a tendency now for landlords to leave their villages and go and live in the big cities?—It is a growing tendency on account of the latest Tenancy Act which is in force in our Province.

40,090. When was that Act passed?—Last year.

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40,091. And you do not approve of that Act?—Not at all, because it has left no opportunity for the zamindar to take an interest in the improvement of the land; he cannot take land for his own cultivation without paying in one case three times and in another case six times the rent paid by the tenant.

40,092. You wish to abolish the system of cash rents and to substitute *batai*?—Yes, so that the landlord may take more interest in the land.

40,093. Is cash rent compulsory on the zamindar?—Yes, it is almost compulsory under this new Act.

40,094. You think the old system of *batai* was better?—Yes.

40,095. Is the *batai* system rendered illegal under the new Act?—Yes, it is rendered illegal. So far as cattle breeding in my Province is concerned, no attention is paid to the improvement of goat and sheep breeding; that, I think, would solve the problem of cow slaughter or sacrifice to a considerable extent.

40,096. Are any zamindars taking any measures to improve their own sheep by introducing better rams?—No, not at all.

40,097. No zamindars are doing that?—Not to my knowledge.

40,098. Is any zamindar taking an interest in the improvement of the breed of goats?—Not to the extent required.

40,099. You want a lead in that direction from the Agricultural Department?—Yes.

40,100. *Professor Gangulee*: Are your moneylenders mostly Mahommedans?—They are both Mahommedans and Hindus.

40,101. *Sir Thomas Middleton*: You complain of the policy that has recently been adopted of commercialising the Government farms?—Yes. We have farms in the district, and my idea is that they should be essentially experimental farms; they should not be required to be paying concerns.

40,102. Was not that change in policy the result of the views of the Legislative Council of the United Provinces?—That change was affected when the Liberals, as we call them, were in the majority on the Council.

40,103. Was the number of demonstration farms reduced at that time? Had you any farms in your district which were closed because of that policy?—No, not at all; why should they be closed? But now the people in charge of the district farm cannot pay sufficient attention to experiments.

40,104. Then you think the Agricultural Department has much too small a staff?—Yes, I think so; in some cases there is no man of the department in a district; in some cases there are only two or three men in one district, of whom two supervise the district farm at headquarters and one who is called an Inspector is a touring officer in the rural areas. In a district one can imagine how much one Inspector can do.

40,105. Have you tried and failed to get some representative of the department to visit you?—There are very few people who care to ask a representative of the department to visit them.

40,106. Why is that?—Because they do not fully appreciate what the Agricultural Department is doing for them; that is owing to their ignorance.

40,107. What size of tube well are you putting in?—It will give me 35,000 gallons of water per hour.

40,108. How much are you going to irrigate?—It will command an area of 1,000 *bighas*. 500 *bighas* every season.

40,109. Are you proposing to grow sugarcane and wheat?—Mainly sugarcane; wheat is not a success in that part of the country.

40,110. What will you grow in that part of your land that is not under sugarcane?—Wheat, but my first concern will be to grow sugarcane.

40,111. *Sir Henry Lawrence*: Have you anything further to say?—I want to draw the special attention of the Commission to my reply to Question 4. I want the Government of India to organise a central association such as they have organised in regard to horse-breeding, which has, I think, done a lot of good.

That will be noted.

(The witness withdrew.)

The Commission then adjourned till 2.30 p.m. on Saturday, the 26th February, 1927, at Hissar.

APPENDIX I.

(Q. 35,159).

Letted No. 3210-I.W./92B-1114W of 1927, dated the 26th March, 1927, from Mr. B. D'O. Darley, C.I.E., I.S.E., Chief Engineer, United Provinces, Public Works Department, Irrigation Branch, Lucknow.

Sir Ganga Ram drew special attention to the formula for calculating the protective value of an acre printed on page 32 of volume I of the Indian Irrigation Commission's Report of 1901-03. He suggested that if this formula were applied to districts other than those needing famine protection works in these Provinces it is probable that we would find that expenditure on canal works although not productive would be permissible. I have now had a statement prepared for all the districts in these Provinces which are not covered by our existing or projected canals. This list which is attached will show how impossible it is to apply this formula to a district where famine expenditure is low, that is, where protection is not needed. To explain in detail why this difficulty arises I attach a note on the subject which makes the matter very clear.

Method of calculating the protective value of an irrigated acre and the permissible capital outlay per acre.

The Royal Commission on Indian Irrigation considered that the best means of ascertaining the necessity for the introduction of canal irrigation was that of calculating the direct protective value of the irrigated area. In their view it could be estimated for any particular tract by considering in the light of past experience,

- (i) probable cost of famine relief in the future where no irrigation project constructed,
- (ii) the population.
- (iii) the area usually cropped.
- (iv) the area which may be regarded as already protected.
- (v) minimum area which should be protected to tide over a period of severe drought.

Then if:—

x = the direct protective value of an irrigated acre, or the capitalised value, at 25 years' purchase, of the saving in the average annual cost of famine which will be effected by every acre brought under irrigation.

F = estimated total cost of famine in a given tract for a period of 25 years, or a quarter of a century.

P = population of the tract with necessary addition for prospective increase.

n = area in acres which should be protected by irrigation for each head of the population.

a = Area in acres already protected.

$$x = \frac{F}{Pn - a}$$

Note on the co-efficient n .—This varies in each tract, but for insecure tracts it will probably never be less than 0.3 or more than 0.5, other things being equal the value of n should diminish as the area normally cropped per head of population increases; but:—

- (i) the character of the cultivation,
- (ii) nature of staple crops,
- (iii) other points affecting the question require consideration also when possible,
- (iv) the conditions in villages which are adequately protected within the same tract, should be considered.

The co-efficient n therefore is extremely difficult to determine. The whole formula depends on a definite assumption that if we protect a certain definite fraction of an acre for every head of population that all expenditure on famine or scarcity will automatically vanish. This is a very broad assumption to make.

Reverting to the formula F is the famine expenditure during 25 years. $(Pn-a)$ is the additional area which we must protect in order that F may vanish, x therefore is the amount of famine expenditure in 25 years that will vanish for every additional acre irrigated, or the capitalised value at 25 years' purchase of the saving in the average annual cost of famine.

Every acre proposed to be irrigated will therefore bring in an average

income direct of $\frac{x}{25}$

The value of x in the opinion of the Commission should not exceed Rs.60 in a district that has suffered very severely from famine.

This formula, as its name suggests, was primarily designed to estimate the utility and the necessity for executing famine protective works in districts which suffer severely from famine. It is a rough empirical formula adequate to the purpose for which it was designed, but it is clear that it must be used with caution. The denominator of this formula is a *difference* and this should make one very chary of applying it in a mechanical manner.

For example let us suppose that Pn is very slightly greater than a . Then the value of x will become colossal and will become infinite when Pn is equal to a . If a is very slightly greater than Pn , x becomes infinite and *negative*. Both these results are absurd and are due to a misuse of the formula. It is clear that the nearer Pn approaches a , the less applicable this formula becomes, and in view of the entirely arbitrary manner in which n is assessed we can, when the difference between Pn and a is not great, make x practically anything we like according to the precise value which we arbitrarily assign to n .

Famine and scarcity expenditure can *not*, as a fact, be entirely eliminated by protecting a certain definite fraction of an acre per head of population. If the formula were really absolutely correct instead of approximately correct, which is all we can demand of any formula, then if $(Pn-a)$ were one acre, as it well might be if the formula were unintelligently applied to a district with a comparatively small famine expenditure, then the irrigation of that *one acre* would wipe out all famine expenditure in the future. Such a conclusion is absurd. It shows that n is an approximate co-efficient embodying a purely empirical and approximate assumption. When all famine expenditure has been met, then if we deduct from this the expenditure that could be obviated by complete protection of the area concerned there would *still* be a small residuum of famine expenditure "*f*" that is accounted for by the economic depression which a failure of the

monsoon induces even in a fully protected district. A statement showing values of x for different districts in the United Provinces has been worked out and accompanies this note; as is to be expected, some of the results are anomalous. This is inevitable when the districts are so near the border line and the famine expenditure so small. Reverting now to the definition of n , n is the protected acreage per head necessary to render a district free from famine expenditure.

When there is no famine expenditure and famine expenditure is just avoided and no more.

$$Pn - a = 0 \dots\dots\dots (1)$$

$$F = 0 \dots\dots\dots (2)$$

$$x = \frac{0}{0} \text{ which is indeterminate.}$$

$$\text{From equation (1) } n = \frac{a}{p}$$

What we have now to do is to select districts in which F is nil or very nearly so. A lakh of rupees appears to be negligible expenditure on famine relief in 25 years. The following table gives values of F , P and a for five districts in which the famine expenditure per head of population is negligible.

District.	F.	P.	a.	n.
Gorakhpur	37,306	3,593,513	949,000	·263
Ballia	39,705	914,110	269,000	·294
Ghazipur	60,903	915,518	272,000	·297
Partabgarh	79,829	940,643	356,000	·378
Moradabad	110,764	1,318,518	228,000	·173
Total	328,507	7,682,302	2,074,000	·270

Common sense tells us at once that the value of x in such districts must be absolutely negligible. Nevertheless the table would show that if we assume n to be 0·3 the value of x in the Ghazipur district is no less than Rs.22·9. This absurd result is due to our assuming a wrong value of n , and also to our applying the formula when it is really inapplicable. It is due also to our neglecting the residuum " f ." These districts all have a small famine expenditure which is probably largely independent of any value that we choose to assign to " n ."

In the case of Ghazipur, the impropriety of applying the formula is at once apparent. To begin with it is clearly impossible to assign a value of n with meticulous accuracy.

Example 1.

Let us apply the formula and let $n = 0\cdot3$. Then in the case of Ghazipur

$$x = \frac{60,903}{274,665\cdot4 - 272,000} = \text{Rs. } 22\cdot94.$$

Example 2.

Taking the same district let $n = 0\cdot325$

$$x = \frac{60,903}{297,543\cdot4 - 272,000} = \text{Rs. } 2\cdot38.$$

Example 3.

Taking the same district, let $n = 0.2975$

$$x = \frac{60,903}{272,366.6 - 272,000} = \text{Rs. } 166.13.$$

All these results are of equal value because all are valueless. They are all valueless because the formula is a difference denominator formula and a most dangerous type to use in a mechanical manner. Referring to example 1, a glance at the denominator shows that had the protected area been increased by a paltry 2,655 acres, the famine expenditure of Rs.60,903 would not have been incurred. This is clearly absurd; or alternatively had the population been reduced from 914,110 to 913,333, that is to say, had 777 persons absented themselves from the district there would have been no famine expenditure at all.

There is no need to further labour the point. The formula is very useful when the famine expenditure is of serious moment and the difference between Pn and a is large enough to warrant its use.

As to Ghazipur it is clear that there is a certain famine expenditure " f " which is not a function of " n " at all. The Gorakhpur district, it will be seen, is the largest of all the districts, and the famine expenditure so small that it should be excluded from our table altogether. It is an interesting district as it shows that " n " may fall below the value of 0.3 assigned by the Commission and yet the district be free from famine expenditure, or at least as free as any district can expect to be. For the four remaining districts assuming that the small famine expenditure is not a function of " n " but dependent on other considerations, we have:—

District.	f .	f/p . Rs. per million of population.	P.
Ballia... ..	39,705	43,436	914,110
Ghazipur	60,903	66,523	915,518
Partabgarh	79,829	84,866	940,643
Moradabad	110,764	84,006	1,318,518
Total	291,201	71,209	4,088,789

This table clearly shows that districts which can fairly be regarded as immune from famine in the true sense of the word have a famine expenditure varying from roughly Rs.45,000 to Rs.85,000 per million of the population in 25 years. The average is roughly Rs.70,000.

$$F \text{ therefore} = Pk.$$

In which k is a constant with an average value of 0.07. It would appear quite reasonable to neglect all famine expenditure of less than one lakh per million of population in 25 years.

This means that the famine formula for x must not be applied when the famine expenditure in 25 years per head of population is one lakh or less. If the expenditure is greater we must deduct f from F before applying the formula and

$$x = \frac{F - 0.1 P.}{Pn - a}$$

Applying the old formula to the Budaon district and assuming a value of n of 0.3

$$x = \frac{653,865}{321,864.6 - 306,000} = \text{Rs. } 41.22.$$

had the population been 1,050,000 instead of 1,072,882, x would have been

$$\frac{653,865}{315,000 - 306,000} = \text{Rs. } 72.65.$$

Applying the new formula

$$x = \frac{653,865 - 107,288}{15,864.6} = \frac{546,577}{15,864} = \text{Rs. } 34.45.$$

Applying the new formula and assuming the population reduced to 1,050,000

$$x = \frac{653,865 - 105,000}{315,000 - 306,000} = \frac{548,865}{9,000} = \text{Rs. } 60.99.$$

The two latter calculations for x are much more likely to be correct than the results given by the old formula.

Statement showing the protective value of an area of irrigation in the various districts.

$$\text{Formula X} = \frac{F}{pn - a}, n = .3.$$

District.	Famine expenditure plus remissions of revenue for past 25 years.	Population in 1921 plus 10%.	Area already protected = Irrigable area.	Protective value, $X = \frac{F}{pn - a}$
	F	P	a	
Bijnor	1,90,767	814,200	87,000	1.2
Badaun	6,53,865	1,072,882	306,000	41.2*
Moradabad	1,10,764	1,318,518	228,000	0.7
Benares	1,74,690	991,443	210,000	2.0
Jaunpur	7,37,850	1,270,616	481,000	Negative
Ghazipur	60,903	915,518	272,000	22.9*
Ballia	39,705	914,110	269,000	7.6*
Gorakhpur	37,306	3,593,513	949,000	0.3
Basti	6,14,184	2,117,751	772,000	Negative
Azamgarh	2,01,560	1,681,523	605,000	Negative
Fyzabad	7,48,089	1,289,123	410,000	Negative
Gonda	23,06,121	1,620,408	392,000	24.5
Bahraich	35,30,655	1,171,915	102,000	14.1
Sultanpur	6,55,650	1,104,303	377,000	Negative
Partabgarh	79,829	940,643	356,000	Negative
Total	101,41,938	20,816,466	—	—

In the case of figures marked *, the high protective value is due to the area already protected being only a little less than the area which should be protected.

APPENDIX II.

AGRICULTURAL NOTE.

By the Honourable Lala Sukhbir Singh.

(See page 654, Question 39,504.)

The Royal Agricultural Commission has commenced its work and is now taking evidence of witnesses, the majority of whom are up to this time experts and officials. May I bring to the notice of the commission that in the year 1889, Dr. Voelcker was appointed by the British Parliament to visit this country and report on the condition of agriculture. On page 11, Chapter ii of his report he has stated that "at his best the Indian Raiyat or cultivator is quite as good as, and, in some respects, the superior of, the average British farmer, whilst at his worst it can only be said that this state is brought about largely by an absence of facilities for improvement which is probably unequalled in any other country, and that the Raiyat will struggle on patiently and uncomplainingly in the face of difficulties in a way that no one else would.

"Nor need our British farmers be surprised at what I say, for it must be remembere^d that the natives of India were cultivators of wheat centuries before we in England were. It is not likely, therefore, that their practice should be capable of much improvement. What does, however, prevent them from growing larger crops is the limited facilities to which they have access, such as the supply of water and manure. But, to take the ordinary acts of husbandry, nowhere would one find better instances of keeping land scrupulously clean from weeds, of ingenuity in device of water-raising appliances, of knowledge of soils and their capabilities, as well as of the exact time to sow and to reap, as one would in Indian agriculture, and this not at its best alone, but at its ordinary level. It is wonderful, too, how much is known of rotation, the system of 'mixed crops,' and of fallowing.

"Certain it is that I, at least, have never seen a more perfect picture of careful cultivation, combined with hard labour, perseverance, and fertility of resource than I have seen at many of the halting places in my tour."

After this, Government of India opened Agricultural Departments in every Province and had a central control over them till the reforms were introduced, but it will appear how little has been done when we see, as stated by Dr. Clouston, Agricultural Adviser to the Government of India, before the Royal Agricultural Commission on 13th October last at Simla, that "if Provincial Budgets were included the Central Government were spending Rs.83 lakhs all over India for Agriculture," which, if calculated on an approximated amount of 50 crores of land revenue proper, excluding so many other incomes from lands, comes to about Rs.1/10/3 per cent., that is three pies per rupee.

Similar has been the case of agricultural industries. A Royal Commission was appointed under the presidentship of Sir T. H. Holland in the year 1916 to make enquiries and report how Indian industries could be improved, but although the report was so full and had several minutes of dissent by such eminent persons as Pandit Madan Mohan Malviya, may I ask what the Government has done?

Now let us see what recommendations this commission will make and what action the Government of India will take on it.

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GLOSSARY.

ABADI	Settled, cultivated.
AHIR	A pastoral caste of Hindus.
AMIN	A subordinate revenue official of Government.
ANNA	One-sixteenth of a rupee; equivalent to 1½d. at exchange rate of one and sixpence to the rupee.
ARHAR	Pigeon pea (<i>cajanus indicus</i>).
ARHAT	Agency, brokerage, commission.
ARHATIA	An agent or broker.
ASHWANI (ASHWIN)... ..	A month of the year, from mid-September till mid-October.
BABUL	A common tree (<i>acacia arabica</i>).
BADMASH	A disreputable person.
BAGASSE	Residue of sugarcane after the juice is expressed.
BAGDI	A low caste of Hindus.
BAJRA	A small millet (<i>pennisetum typhoideum</i>).
BANIA	A Hindu trader or money lender.
BANJARA	An itinerant tribe of grain and cattle merchants.
BARANI	Unirrigated land depending on rain for its water supply.
BATAI	Payment of rent in kind, by division of produce between landlord and tenant.
BEL	A small sugar factory.
BEFARI	A shopkeeper or travelling trader.
BERSEEM	Egyptian clover (<i>trifolium alexandrinum</i>).
BHABAR	The forest under the Sewalik hills.
BHADIA	A month (August-September).
BHAIYACHARA	A class of land tenure in the United Provinces.
BHUSA	The husk or chaff of grain; the straw.
BHUSHI	See <i>Bhusa</i>
BIGHA	A measure of land; the standard or <i>pucca bigha</i> is 3,025 square yards or 5/8ths of an acre; a <i>kutchha bigha</i> is in some places 1/3rd in others 1/4th of a standard <i>bigha</i> .
BINAULA	Cotton seed.
BINDI	Vegetables (lady's fingers).
BOURI	A low caste of Hindus.
BRAHMACHARI	A student of religion; one leading a life of celibacy and devoting himself to religious study.
BUND	A dam.
BUNJAR	Barren.
CHABENA	Parched grain; an allowance to grain weighmen.
CHADAR	A sheet or cloth.
CHAIT	A season (March-April). <i>Chait badi panchami</i> —the fifth day of <i>Chait</i> .
CHAK	A block of portion of land.
CHAKBAT	Pertaining to blocks (<i>chaks</i>).
CHAMAR	A worker in skins. One of the depressed Hindu castes.
CHANA	Gram, chick pea (<i>cicer arictinum</i>).
CHAPRASI	A peon, messenger.
CHARAS	A water lift.
CHAUKI	A post where a watch or guard is stationed.
CHAUKIDAR	A watchman.
CHHATAK	One-sixteenth part of a <i>seer</i> .
CHOTA ADMI	Lit. a small man.

- CHUNGAWALLAH** ... A person (*wallah*) who receives a contribution (*chungi*) in grain for the use of market conveniences.
CIKRA Denoting one hundred.
COLABA... ... Water channel; also denotes outlet from a main to a branch channel.
CROBE Ten millions.
- DAL** A generic term applied to various pulses.
DEODAR The Himalayan cedar (*cedrus libani*).
DESI (DESHI)... ... Native to the country; indigenous.
DHAK A moderate sized deciduous tree (*palas*) with a brilliant red flower (*butea frondosa*).
DOAB A tract of land lying between two confluent rivers.
DUBLA A low caste of Hindus.
- EKKA** A one-horse vehicle.
- FALGUN (PHAGUN)** ... The name of a month; mid-February to mid-March.
FASL Crop or harvest.
- GAUNI** A measure of rice.
GHAR A strip of land lying along, or near the banks of a river.
GHAUT (GHAT) ... A mountain; a landing place on the bank of a river.
GHI Clarified butter.
GHOBI A herdsman or milkman.
GOWALA (GWALA) ... See *Ghosi*.
GOWSHALA A refuge home for cattle.
GRAM See *Chana*.
GUAVA A small evergreen tree (*psidium guyava*), grown solely for its fruit.
GUL A water channel.
GUNT A measure of land, equal to 121 square yards.
GUR Unrefined Indian sugar, jaggery.
- HAI SIAT (HAISYAT)** ... A statement of assets and liabilities.
HAKIM... ... A practitioner of one of the Indian systems of medicine.
- JALPAN**... ... Drinking water; any light refreshment.
JAMABANDI An annual account of lands held in a village and the amount of land revenue due on them.
JAT A race of people inhabiting Northern India.
JHIL A shallow lake, a swamp.
JHUMING Temporary cultivation in jungle clearings.
JINSWAR Classification of land according to crops.
JOTDAR A cultivator.
JUAR (JOWAR)... ... The large millet (*sorghum vulgare*).
- KADBI (KARBI)** ... Straw of juar (millet).
KALAR (KALLAR) ... Saline efflorescence.
KALAR (KAHAR) ... A low caste of Hindus.
KAHAR A water carrier.
KAMIA... ... An agricultural labourer.
KANDA A piece or portion; applied to dried cow-dung cakes.
KANKAR Nodules of limestone found in the soil.
KANUNGO A subordinate revenue officer.
KANS A coarse deep-rooted grass weed (*saccharum spontaneum*).
KAPAS Cotton with seed still adhering, unginned cotton.

KARDA ...	...	Exchange, barter.
KASHTKAR ...	...	Cultivator.
KATHA ...	...	A grain measure of 5 seers.
KHADAR ...	...	Moist alluvial land easily irrigated or which can grow crops without irrigation.
KHADDAR ...	...	A kind of coarse cloth made from homespun yarn ; Khaddar movement—a movement to boycott imported cloth fabrics.
KHADI ...	...	See KHADDAR.
KHADIR ...	...	The catechu tree (<i>acacia catechu</i>).
KHANDSARI ...	...	Broker, contractor.
KHARBUZA ...	...	Melon.
KHARIF ...	...	The autumn harvest ; crops sown in the beginning of the rains and reaped in October—December.
KHATEDAR ...	...	The occupier or owner of a field.
KHATTI ...	...	A grain pit.
KHET-BAT ...	...	Field by field.
KHEWAT ...	...	The record or register of the shares in which a village is distributed.
KHUDKASHT ...	...	KHUD (self) and KASHT (cultivation) ; land cultivated by the proprietor, i.e., part of the home farm.
KIARI ...	...	A field surrounded by a bank or <i>bund</i> .
KIKAR ...	...	See <i>Babul</i> .
KOLHU ...	...	A crushing mill.
KOLI ...	...	The name of a low caste of Hindus.
KULACHAR ...	...	Family usage or observance.
KURK AMIN ...	...	An officer employed to attach a property and realise the proceeds.
KURO ...	...	A measure of grain (approximately 20-lb. weight).
KUS ...	...	A grass weed (<i>poa cynosuroides</i>).
KUTCHA ...	...	Inferior or bad [lit., not solid].
KUTOHRA ...	...	Refuse, rubbish.
LAKH ...	...	One hundred thousand.
LATIFUNDIA ...	...	Large estates.
LINGAYAT ...	...	A sect ; followers of Siva.
MADRAS MEASURE ...	...	2½ lbs. (unhusked rice).
MAHAJAN ...	...	Merchant.
MAHAL ...	...	A district or province.
MALIK(A) ...	...	A cultivator possessing an hereditary or proprietary right in an holding.
MAMULI ...	...	Ordinary.
MANDI ...	...	A market.
MATIARI ...	...	Clay soil mixed with a small proportion of sand.
MAULVI ...	...	A learned Muslim ; a teacher.
MAUND... ..	...	A weight of 82·28 lbs. (<i>pucca maund</i>) ; has different values for different commodities and for the same commodity in different places.
MELA ...	...	A religious fair ; MAGH MELA—a fair held in MAGH January—February.
MISTRI ...	...	A mechanic, carpenter, blacksmith, etc.
MOFUSSIL ...	...	The country as opposed to the town.
MOTA ...	...	A well tapping an underground stream.
MOTH ...	...	The kidney bean (<i>phaseolus aconitifolius</i>).
MONG (MUNG) ...	...	Green grain (<i>phaseolus radiatus</i>).
NAIB ...	...	A deputy or assistant.
NAZARANA ...	...	A gift ; a contribution in excess of the usual payment.
NIM (NEEM) ...	...	A large forest tree (<i>azadirachta indica</i>).
NULLAH ...	...	A water course.

PALKI ...	...	... A palankeen.
PANCHAYAT ...	...	... Literally a committee of five; used to describe an association of any number of persons, instituted for objects of an administrative or judicial nature.
PANDIT... ..	...	... A learned Brahmin, a teacher.
PAR ... ..	...	... Rice land.
PARGANA ... ..	...	... A district; an administrative unit.
PASI ... ..	...	... A low caste of Hindus whose occupation is extracting the juice of the <i>tari</i> palm.
PASSIM ... ..	...	... In all directions.
PATNI PATNIDAR ... ..	...	... See PATTI.
PATRI ... ..	...	... A strip of land.
PATTI ... ..	...	... A division of land, held by co-sharers, into separate portions or strips. <i>Patnidar, Pattidar</i> —a co-sharer.
PATWARI ... ..	...	... A village accountant or registrar.
PEON ... ..	...	... A messenger.
PHAGUN ... ..	...	... The name of a month (mid Feb.—mid. March).
PIE ... ..	...	... One-twelfth of an anna.
PUCCA ... ..	...	... Solid, correct, complete, &c. (the contrast in all respects to <i>Kutchal</i>).
PURDAH ... ..	...	... A veil, screen; the practice of keeping women secluded.
PUS ... ..	...	... The name of a month (Dec.-Jan.).
QURA ... ..	...	... A plot of land.
RAB ... ..	...	... A stage in the conversion of cane juice into sugar; also the practice of burning leaves, sticks, etc., on land before sowing.
RABI ... ..	...	... The season of spring; crops sown in autumn and reaped at the end of the cold weather.
RAGI ... ..	...	... An inferior variety of millet (<i>eleusine coracana</i>).
RAJBUHA ... ..	...	... Canal, distributary.
RAMAYAN ... ..	...	... A dramatic epitome of the adventures of Rama.
RATOON ... ..	...	... A crop which, instead of being freshly planted each year, is allowed to grow up on the old stools for one or several years in succession (a common practice in sugarcane cultivation).
REH (REHALA) ... ..	...	... Land impregnated with sodium salts and thereby rendered barren.
ROTKARA ... ..	...	... A cook.
RYOT ... ..	...	... A cultivator.
RYOTWARI ... ..	...	... The system of tenure under which the revenue is paid by the cultivator direct to Government.
SAL ... ..	...	... A forest tree (<i>shorea robusta</i>).
SALOTRI ... ..	...	... A horse doctor.
SAMITHI ... ..	...	... A committee or society. <i>Seva Samithi</i> —a society formed for the public service.
SANAD ... ..	...	... A charter, certificate of honour.
SANAI (SANN) (SUNN)... ..	...	... Bombay hemp, a leguminous fibre crop (<i>crotalaria juncea</i>); also used as a green manure.
SARSON ... ..	...	... An oil seed (<i>brassica campestris</i>).
SASTRA (SHASTRA) ... ..	...	... A scripture; a work of authority, e.g., the writings of the six schools of Hindu philosophy.
SAYAI ... ..	...	... An excess of one-fourth; interest at the rate of 25 per cent.
SEER ... ..	...	... A weight (2.057 lb.).
SENJI ... ..	...	... A fodder crop (<i>melilotus parviflora</i>).
SHISHAM ... ..	...	... A forest tree (<i>dalbergia sissu</i>).
SHROFF ... ..	...	... A money changer, a banker.
SHUKKAR ... ..	...	... Sugar.

SIR	...	...	Home farm land; the personal, family or private holding of a proprietor or co-sharer.
SIRIS	...	...	A forest tree (<i>albizzia lebbek</i>).
SLOKA	...	...	A verse.
SORGHUM	...	...	A genus of grasses the most important of which is juar, the great millet (<i>sorghum vulgare</i>).
SOWCAR	...	...	A moneylender.
SUDDER (SADR)	...	...	Chief, foremost.
SUFA	...	...	A basket for winnowing grain.
SURRA	...	...	A disease affecting horses and camels especially.
SWADESHI	...	...	<i>Swa</i> (own) and <i>desh</i> (country).
TACCAVI	...	...	An advance made by Government to cultivators for agricultural purposes.
TAHBAZARIA	...	...	A tax levied on sellers of articles in a bazaar.
TAHSIL	...	...	A local revenue division of a district.
TAHSILDAR	...	...	A revenue officer in charge of a tahsil.
TAL (TAHL)	...	...	A dam.
TALUQDAR	...	...	A big landowner.
TAULA	...	...	A weighman.
TAUNGYA	...	...	Temporary cultivation in jungle clearings.
THAKUR	...	...	A person of Rajput descent.
THANA	...	...	A police station; a post.
THARU	...	...	Designation of people occupying villages in the Tarai on the borders of Rohilkhand.
THOK	...	...	A local division of village lands.
TONGA	...	...	A horse or bullock carriage.
TONGAWALLAH	...	...	The driver of a tonga.
TORIA	...	...	Rape (<i>brassica campestris</i>).
USAR	...	...	Land impregnated with sodium salts and thereby rendered barren.
VAID	...	...	A practitioner of one of the Indian systems of medicine.
VAKIL	...	...	A lawyer.
WAQF (WAKF)	...	...	A dedication of property by will or by gift for the benefit of society.
ZAMINDAR (ZEMINDAR)	A landowner, a peasant proprietor.
ZILLADAR	The revenue officer in charge of a group of villages.

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