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Oral Evidence.

5830. *The Chairman*: Mr. Knight, you are Collector of West Khandesh?
—Yes.

5831. You have put in a very interesting answer to our Questionnaire, and we are greatly obliged to you for the trouble which you have taken. Would you like to make any statement of a general character at this stage, or shall we proceed at once to question and answer?—I should like to say that my knowledge of agriculture is merely such as I have acquired incidentally through my work as District Officer. I do not profess in any way to be able to deal with the matter scientifically, or to be able to support any suggestions I have given by detailed statistics.

5832. On page 283 of your written evidence, you talk of the difficulties of inducing cultivators to take up improved methods. Have you had any experience of demonstrations on cultivators' own fields?—I have not made any personal demonstrations, but there has been a fair number of them in the West Khandesh district by Taluka Development Associations.

5833. Carried out on the cultivators' own fields?—Yes.

5834. What do you think of the value of that type of propaganda?—My own opinion is that it is the only one which can possibly be successful. I should like, however, to give an example which came to my notice last week. I was inspecting certain villages for their crops, and there accompanied me a very substantial *patil*, a cultivator who always grows Akola *bajri* himself, and has been doing it for the last 10 years. I, he, and other cultivators from the next village were tramping round the fields, and all the time he was getting at them to explain why they did not use this Akola *bajri*. They still insisted that although they had seen it grown successfully in his own fields, and although they knew he fed his own bullocks with it, yet other cultivators' bullocks would not eat it. That was as far as we could get. They had the example in the next village of a cultivator of their own Mahratta caste growing it successfully for the last 7 or 8 years and feeding his bullocks with it, yet they would not take it up.

5835. On page 287, you say: "I am an advocate of every possible extension of made roads." You are strongly of opinion that better communications would be greatly to the advantage of the cultivators?—Judging from my experience of districts, it must be so. (The *kutcha* roads are so bad in many parts of the districts that the bullocks cannot take a full load, so when the cultivator takes his cotton to market he has to make more trips, or take more carts. Besides, to take a cart over a bad road has a very wearing effect on the bullocks.)

5836. Is any attempt made by the villagers to improve these by-roads?—I should not like to say no, but the signs are very small.

5837. No doubt, it would be difficult for them to make them passable during the rains, but if they were attended to at the end of the rains, before they became hardened, could they not be greatly improved?—I doubt whether it could be done by village agency. The black cotton soil at the end of the rains is a mass of cattle footprints, nearly a foot deep, and in a very few weeks it gets as hard as iron, and you can do nothing with it.

5838. These roads are under the District Boards, are they?—In theory, yes. The ordinary by-roads are under nobody.

5839. Do the District Boards take no active steps to improve them?—No. The Taluka Boards supply a little money for smoothing away the worst places if they are pressed to do it by some influential local personage, but that is as far as they can get.

5840. Have these roads grown worse in your experience?—I do not think so.

5841. They are as bad now as they always have been?—They are certainly no better.

5842. What steps do you suggest might be taken for their improvement?—Practically speaking, I imagine, it is entirely a question of finance with the Local Boards. Personally, I would put the money into made roads instead of by-roads.

5843. Do you advocate a subsidy from the Provincial Government?—If the Provincial Government can afford it, certainly.

5844. Would you suggest that in the event of a District Board not carrying out the work, the matter should be taken out of its hands and undertaken for a period at any rate by the Provincial Government?—I think if the subsidy was given, the District Local Boards would carry out the work.

5845. If they did not?—I do not think I should. The cultivator has to learn that the District Local Board exists for his own interests. After a time he will realise that if the District Local Board does not spend the money on the roads, he had better turn them out and put somebody else in instead.

5846. Do you see any signs of villagers taking more active interest in their own local government?—I hope so. But I have talked to a great many villagers about their Taluka Local Board, and my impression is not altogether encouraging that they are learning rapidly. I am afraid many of them do not know who their Local Board member is. The matter continually crops up before the District Officer, because every village wants its roads mended, or a new road or a school. Backward districts are still under the impression that the Collector has all the funds at his disposal. I have tried often to impress on people in West Khandesh that if they want communications or schools they should bother their local member of the Taluka Board, but the majority of the villagers do not know for whom they voted or who is their sitting member. But I admit that West Khandesh is a backward district.

5847. You do not think that the plan of giving a subsidy in part payment, with the proviso that if the work is not carried out the District Local Board should be dissolved or certain work should be taken from it, is feasible?—I should prefer to do it the other way, and try to awaken the people who elect these Boards to the fact that they must see they do their work.

5848. We hoped to get the idea they were awakening to that, but you have not encouraged us?—I think they are better than they used to be, but you must remember this is a fairly new system.

5849. On page 290, you give some very important figures which you say you have got from local agriculturists, being estimates of the cost to a cultivator of starting fresh on an economic holding. Do you accept them as accurate?—No, I think they are on the high side. I can give you details if you want them.

5850. On the same page you say, "The monsoon factor can, in my opinion, only be combated by extension of improved methods of cultivation, in particular dry farming." Do you suggest the ideal method of dry farming is capable of discounting to any important extent a failure of the monsoon?—I can only judge by an example we had in West Khandesh last year, where the Dhulia Taluka Development Association ran experimental cotton plot and kept the soil worked round the crop the whole time. The later rains failed, but that crop was roughly twice as good as the other cotton crops in the same village.

5851. On page 291, you talk about the possibility of making inalienable economic holdings impartible. Would you suggest compulsion there?—Personally, in a district like West Khandesh, I would; I do not think it would excite so much opposition as is anticipated.

5852. On the same page, you deal with fragmentation of holdings, and in answer to Question 7 (a) you say: "I would like to try the experiment of removing land in some areas from the operation of Hindu law, making fragmentary cultivation a criminal offence involving forfeiture of the land. This sounds excessively Draconian, but obviously cultivable land cannot increase *pari passu* with the population." Have you any indication as to how action of that kind will be received by the population?—I think it rather depends on the population itself. In West Khandesh we have a fair area of new land

which is now being given out for cultivation. There is very great land hunger there, and if that land were given out on such terms I do not think anybody would object at all. They will be only too pleased to get the land. In backward areas like West Khandesh, I do not think that even if we apply it to land already given out, people will mind it.

5853. The Commission has had before it some figures tending to show, apparently, that progressive fragmentation reaches a point when it no longer increases and when the tendencies making for consolidation balance the tendencies making for further fragmentation. Your figures on page 292 do not appear to support that theory?—No, I do not think they do. We are still in the decreasing stage in West Khandesh, but the district has been opened up almost entirely in the last hundred years, and the period has not yet been long enough for it to have its worst effects.

5854. Do you agree from your experience that there is a point when stability is reached?—I have never looked into it carefully, but I have never found a case where to me it appeared to be reached. I admit I have not gone into it statistically in any district.

5855. What is the area which you know best where a large and more or less stable population has been cultivating the land for many centuries?—Parts of the Thana district.

5856. There the Hindu law of inheritance applies?—Yes.

5857. If the tendency towards further fragmentation carried with it no natural check surely in a district of that kind, you would have infinitely more aggravated conditions of fragmentation than you actually have?—Yes. In the Thana district I have known fields which, I think I should be right in saying are only as big as this table; certainly no bigger.

5858. From your experience of that district, do you think that fragmentation is going from bad to worse there, or that stability has been reached?—Certainly my impression, when I was there about ten years ago, was that fragmentation was still increasing.

5859. On page 293, you say, "The only remedy I can suggest is compulsory consolidation in a few sample villages where a majority or even a fair minority of the cultivators can be persuaded by propaganda of its advantages." I suppose you know that successful voluntary endeavours have been made in the Punjab?—No, I am afraid I know nothing about that.

5860. I was a little surprised to see that on page 294 you say it is an economical method for a cultivator to sell his bullocks at the end of one cultivating season and buy new ones just before the next. Have you worked out the finance of that?—I have not worked it out in detail, but various cultivators and others have told me of it. It is mainly due to the cost of keeping the bullocks alive before the rains when the price of fodder is so high.

5861. I can conceive that so long as only a very small portion of the population follows that method it might be economical, but if large numbers of people did it, it could hardly remain so?—I do not quite agree, because they sell them to professional graziers who take them off to suitable grazing grounds (and there always are suitable places somewhere) and bring them back later. There is ample grazing if you can get the animals to the grass.

5862. It is only a question of selling to professional graziers who will sell them back to some cultivator?—Yes.

5863. You do not think the method might lead to a reduction in the total number of draught bullocks?—I do not think so.

5864. On page 295, talking about the possibility of a decline in the fertility of the land, you say, "In discussion with various cultivators as to the alleged decreasing fertility of the district (of course largely attributable to the fact that some 50 years ago only the better lands were cultivated), etc." Is that in your experience an explanation of the alleged reduction in fertility?—I would not say that, but I would say that it is partly the reason why the cultivator thinks that there has been such a large reduction.

5865. Do you think that the fact that 50 years ago, as you say, only the better lands were cultivated, whereas now both the better and the indifferent lands are cultivated, explains in many cases the idea that the land as a whole has declined in fertility?—I think it does.

5866. *The Raja of Parlakimedi*: Have you got these demonstration farms spread over your district?—We have a Government farm in Dhulia where they run an agricultural school and experimental cotton breeding station. Beyond that the Taluka Development Associations arrange, as far as their funds admit, every year two or three demonstration plots for demonstrating improved methods of cultivation, or manuring or improved seed in their own talukas. But it is worked by the Taluka Development Associations and not by Government.

5867. Would you not like to have one or two demonstration farms on a large scale in some important centres?—Personally I do not believe that you will ever reach the bulk of the cultivators unless you show them improved methods on their own actual holdings. To me it is doubtful whether an ordinary Government farm, however useful for experimental purposes, will produce much impression on the ordinary cultivator. He thinks that Government's resources are so infinitely superior to his own that it is no use his trying to follow them. That is how he views it. Remember I am only speaking of a backward district and not of an advanced district such as Poona.

5868. As regards these country roads, in other parts of India in backward tracts, for instance the Agency tracts, their management is taken over by the Revenue Department. Do you think the same thing can be followed in Khandesh?—In the more backward parts of Khandesh I would be quite willing to undertake it. The Forest Department have a good deal of that sort of work to do in the Satpura areas, but they have never yet been provided with sufficient money actually to make the roads. All it has been possible for them to do is to make the roads passable for timber traffic.

5869. Government cannot be approached for funds?—Government have been approached and we have managed to get for our District Board, only the other day, Rs. 30,000, for a particular road, on condition that the District Local Board would spend all the money this year. But the Provincial Government are not, I understand, particularly over-burdened with money to spend in grants at present. It takes a great deal of worrying to get any grants at all.

5870. *Sir James MacKenna*: I infer from your memorandum that you take a keen interest in agricultural and economic questions in your district?—I am afraid I cannot claim that. I cannot claim to know more than what actually touches my own work.

5871. Have you had any agricultural training at any stage of your career?—I had the ordinary Assistant Collector's agricultural course in Poona some years ago. I think it was for a month.

5872. Does that course still continue?—I cannot say.

5873. Have you a Deputy Director of Agriculture in your district?—We have one for West Khandesh and the adjoining districts of East Khandesh and Nasik.

5874. Where is he stationed?—At Nasik.

5875. That is not in your district, is it?—No.

5876. Have you any other agricultural staff in your district?—There are the officials of the Government cotton farm and agricultural school, and men working under the Taluka Development Associations, called Agricultural Overseers.

5877. Do the Deputy Director's diaries go through you to the Director?—No.

5878. Do you think it would be a good thing if they did?—I doubt whether one could do much practical good by looking at them.

5879. I would like to know a little more about these Taluka Development Associations. Are they voluntary associations or statutory?—They are entirely voluntary, but they receive a grant from Government.

5880. And what do they expend it on?—They usually employ a fieldman and pay him, and as I was trying to explain, they have demonstration plots in their talukas on the cultivators' lands.

5881. Do you think that this voluntary system is the best? Do you prefer it to a statutory committee appointed and financed by Government?—I certainly do prefer the voluntary bodies myself. Of course, to begin with the Taluka Development Associations need a certain amount of pushing from official sources to get them going.

5882. There are no Government officials on these associations?—Yes, the local *mamlatdar* is usually a member, and there is the Agricultural Overseer.

5883. *Professor Gangulee*: It is very gratifying to see a Collector of a district taking so much interest in rural problems. Do you find it possible to pay attention to rural questions in addition to your own executive and judicial duties?—A Revenue Officer is very closely concerned with rural problems. After all his main duty is land revenue and that entirely depends upon agriculture.

5884. I follow that, but your function is to collect revenue. The interest you have taken in the Taluka Associations and the social, moral and educational welfare of the rural population is not really your duty?—I am afraid it is generally considered that the Collector's duties extend to everything in the district.

5885. Do you think that the agricultural outlook in a District Magistrate is helpful to him in discharging his duties?—It certainly is.

5886. Would you recommend some sort of agricultural training for these District Officers before they take up their duties?—Frankly, I have forgotten everything I learnt at the agricultural course at Poona some years ago!

5887. Are you in touch with the Director of Agriculture here?—I write to him if I want to know anything. If he happens to come to my district he discusses things with me if I happen to be at headquarters, or perhaps puts up with me.

5888. Do ryots come to you for any help with regard to better seed, or with difficulties regarding irrigation or in the event of an outbreak of cattle disease?—It all depends upon where I happen to be at the moment. If I am in a village where there is any difficulty with regard to irrigation or cattle disease they will come to me and I will direct them where to go.

5889. They do not seek your assistance in any way, but they complain of their difficulties when you visit their village?—West Khandesh is a backward district. They seek the assistance of the Collector in every possible matter and especially for restoring erring wives to their husbands. In my area these backward Bhils will bring everything to the Collector, and usually these are matters in which he can take absolutely no action.

5890. You state here that the ryot is intensely conservative. Is that your opinion?—Yes, most certainly.

5891. Yet you say later that they have taken to the use of copper sulphate extensively and that they took 3,000 packets in 1923 and recently they have taken 8,000, so they take to these improvements after they are convinced that these improvements are economic and will benefit them?—Certainly; if the cultivator is really convinced he will obviously take improvements. But it is very difficult to convince him.

5892. Even if these improvements are demonstrated on his own land?—I am afraid so. I have given the instance that occurred to me last week, where one man has been cultivating Akola *bajri* for years but his neighbours will not take it up.

5893. You say Taluka Development Associations require for their motive force some energetic local official. Do you suggest that these Development Associations have not yet found their feet and cannot be guided by non-

officials as yet?—In West Khandesh they have not, but they are going that way. In the oldest of these associations the *mamlatdar* is on the committee but much of the spade work is now done by non-officials. The other Taluka Associations are working towards that ideal. The most recently formed one was got up by the *mamlatdar* and I hope it will continue.

5894. Have you personally visited any meetings of the Taluka Associations?—I have attended their annual meetings, which are merely formal occasions for making speeches by the Deputy Director of Agriculture and officers of the Co-operative Department.

5895. The members invited you to attend these meetings?—Yes.

5896. Is there in your district any adult education propaganda?—They have an agricultural boarding school in Dhulia; they have got one or two agricultural bias schools in the district.

5897. Do Taluka Development Associations take up adult education work?—No.

5898. With regard to the attitude of village *patels* you say that they view the affair with something akin to good-natured contempt or pity for a misguided official who thinks a Government officer can teach them their business. What do you mean by the *patel's* good-natured contempt?—His contempt is with the idea that myself or an official who spends his time sitting in an office and coming from another country can teach him anything about agriculture, which his ancestors have been doing for centuries. I consider it natural, and it is probably justified.

5899. But, villages have taken certain improvements from your hands, for instance the use of sera against contagious diseases of cattle?—I was merely referring to my small demonstrations.

5900. Do you consider this attitude is a serious obstacle to agricultural propaganda work?—But there is a great deal to be said for the *patel*. He and his ancestors have farmed certain land for thousands of years and it would be very unwise to change his methods, without ample proof that the change is for the better.

5901. That is so in every country. European farmers had to go through that stage, and they will stick to their empirical knowledge and not take to new methods unless they are convinced?—I suppose so; I have never farmed anywhere.

5902. With regard to demonstration, you suggest that more funds should be granted to the Taluka Development Associations. They do get a grant of Rs. 1,000?—Yes.

5903. You consider that amount not sufficient?—I think one will do more good with more money.

5904. They must draw up a programme before they get money from Government. Have they developed any system of propaganda or educational work, or anything of that kind?—Every Taluka Development Association, as far as I know, makes out a programme for its next year's working. For instance, there are to be so many plots and such and such things to be done on them.

5905. You know that Government will not give further grants for any slipshod methods of work?—This is a case where I think it would be worth while gambling on Taluka Development Associations working properly.

5906. With reference to demonstration you say "by making a fuss of such-field demonstrations". What do you mean?—When the demonstration cotton crop is ready for harvesting, issuing invitations to all the local people.

5907. On page 286 you say the increase in the use of copper sulphate is largely due to 'pushing' by the Revenue authorities. What part did the non-official agencies, local bodies or Taluka Development Associations take in this particular matter?—In this particular matter they took practically none.

5908. The Revenue authorities introduced this improvement?—I think I am right in saying the Agricultural Department introduced it and Govern-

ment said we should afford them all possible assistance from the Revenue Department. I therefore saw that the subordinates made the people acquainted with the existence of copper sulphate and supplied the taluka towns and various village officers. Whether they were all used I cannot say, but so many were paid for and I hope they were used.

5909. These Revenue authorities are officials. The cultivators have been benefited by the officials directly at least in this case?—I hope so.

5910. With regard to roads, am I right in thinking that the local bodies have not paid adequate attention to this question from apathy, or is it due to lack of funds or anything of that sort?—I am afraid I cannot give an opinion as to the validity of the various claims on local bodies; whether roads should take precedence over education or health is a matter for the local bodies to decide. I should not attempt to dictate to them except in an emergency.

5911. Do you come into contact with the members of local bodies?—I see a good many of them.

5912. Do you speak to them about better communications?—To give an instance, often when I go to a village the villagers complain to me about the roads and want them mended. I always say to them, "Government, in order to teach you, have given all the money to the Taluka Local Board, and you should go to the local member about it. Who is your local member?" In many cases they do not know who the local member is. In most cases they do not remember whether they voted or not. In this particular case the local member happened to be with me. I explained to them that to get their village road mended they must sit at the *patel's* door and make things unpleasant for him till he gets up in the Taluka Board and manages to get a grant for their village. That is not the traditional method of getting money in this country. The traditional method was to approach Government. It will be a long time before they learn the new way of doing it.

5913. With regard to *taccavi* loan, I think it is distributed by the Revenue Department at present. Do you regard that arrangement as satisfactory?—I think that in most of this Presidency it is to be distributed or is distributed for minor matters through the co-operative credit societies.

5914. Do you approve of that method?—Yes, in the most advanced places; but in places like West Khandesh it is impossible, and Government had to exempt the district.

5915. West Khandesh, I think, is comparatively prosperous compared to the Deccan?—Yes, comparatively speaking.

5916. Do you find that on account of cotton their economic condition is much better than in other parts?—Do you find any change for the better there?—It is very difficult for me to make comparisons, because since 1916 I have been either in the Secretariat or in Nasik or in the Khandesh district, so I cannot really compare it with Thana or Satara or Ahmednagar.

5917. What is your general impression of the rural population?—I cannot give you statistics, but my own impression is that it is better than it was.

5918. The economic condition is decidedly better than it was before?—I should not go so far as to say decidedly. My own impression is that the economic position has improved.

5919. What about the primary education movement in your district?—The District Local Board want to introduce compulsory primary education when they have the necessary buildings, masters and funds. They cannot introduce compulsory primary education for some years for lack of masters, lack of buildings and lack of funds.

5920. The demand for education is there, but because they cannot get teachers and adequate funds they have not introduced it?—Yes.

5921. You find there is a demand for primary education?—I would say from my experience that the demand for primary education is a good deal more than it was 10 years ago.

5922. Do you find any dynamic changes coming into the villages?—No.

5923. With regard to their social life or outlook there is no visible change?—I cannot think of any at the moment.

5924. What about litigation?—Is it dying out or increasing?—It is very difficult to say. It is not very bad in West Khandesh, partly owing to the ignorance of the people. I cannot say what it is in comparison with what it was years ago.

5925. How many voluntary social service associations are there in your district? Do you come in touch with them?—There is one Health Association in Dhulia city.

5926. Purely non-official?—There are official members, but it is essentially non-official.

5927. Are they working among the villagers?—No; it is in Dhulia city. I cannot, off-hand, think of any other.

5928. Do you know of any particular non-official agencies working in the village areas in your district?—Yes, I think at the moment the local Indian National Congress Committee have appointed a paid propagandist to tour the district and to conduct an economic enquiry into the conditions of the villages and do political propaganda.

5929. Do you know whether the motive is purely political or whether he is trying to uplift the people of the country?—I would rather not give an opinion.

5930. *Mr. Calvert*: On the question of roads, have you ever thought that it might pay you to take a loan to cover all the non-recurring cost such as roadway embankments, bridges and so on, leaving the local body to finance wearing cost, maintenance and repairs out of revenue?—I did suggest that to the West Khandesh Local Board. We have three taluka towns north of the Tapti which are totally unconnected by main roads and in the rains it is impassable, but at the moment the District Local Board is busy with the expansion of its educational programme, and some local notabilities had a scheme for a light railway to be built by a private company, so it was not worth while pressing them any further.

5931. The fact that you have often to meet the whole cost from revenue is a difficulty?—A very great difficulty.

5932. Have you worked out roughly how far the maintenance charge of a metalled road is covered by the difference between transport charges on metalled and unmetalled roads?—No. I can only say that in one taluka the market rate for cartage is 4 annas a mile on a metalled road and 5 annas a mile off it during the dry season.

5933. It would be a simple calculation to find out how many carts pass over day and see whether it would be economic to have a metalled road?—In the wet season they cannot go off the metalled road.

5934. The charge is 25 per cent. more on a *kutch*a road?—Yes.

5935. With regard to the dependence of your people on the village *sowcar*, is the Usurious Loans Act made use of in your district?—I am afraid I do not know.

5936. Is it your experience that debt follows credit, *i.e.*, your big owners more in debt than the small one, the small owner more than the tenant and the tenant more than the labourer?—My impression is that that is so, not in any definite proportion.

5937. Not in any exact proportion, no; but debt does tend to follow credit?—That is my impression, but I admit I have no statistics to back it up.

5938. *Dr. Hyder*: Is it your experience that the large landowner may be up to the neck in debt, but that if that happens to the small man he is submerged?—Yes.

5939. *Mr. Calvert*: On page 289 the reasons you have given for indebtedness all indicate decreased credit, uneconomic holdings, bad years and so on. Those things tend to reduce a man's credit and therefore his borrowing power.

becomes less?—Certainly, but he has probably started with a fair debt to begin with.

Sir Chunilal Mehta : The price of land goes up and increases his borrowing power.

5940. *Mr. Calvert* : Is it not your experience that in a more prosperous district the debt is higher than in a poor district?—I cannot say; I have never gone into it.

5941. I gather that some sections of your people can mortgage their land, while some cannot?—Yes.

5942. Have you any idea of the proportion between secured and unsecured debt?—No. We have 2 lakhs of Bhils, whose credit is very small. The rest of the population are fairly good agriculturists and hold land of their own on alienable tenure.

5943. The Bhils cannot mortgage?—No.

5944. They have no mortgage debts?—No.

5945. (Are they less in debt than those people who can mortgage?—As far as the amount of money is concerned they are much less in debt, but for practical purposes they are often more. The rate of interest they have to pay is much higher, and very often they have to pay back their debt by acting as farm labourers for the people who lent them the money, and continue like that from year to year.)

5946. You know that in Jhelum Colony there is primogeniture and impartibility, but relations get a grip on the owner and there is a sort of indefinable tenure of partnership and the benefit of the impartibility is apt to disappear?—Yes.

5947. Do you not think that might occur here too?—Certainly it might, but I think the experiment is worth trying in Khandesh, where we have this land to give out. I admit I know nothing about similar experiments elsewhere.

5948. They also work on the land free, they help to provide bullocks, and so on, and have a sort of indefinable claim on the land which a civil court might admit?—I quite realise that must be the case, at any rate to begin with.

5949. It is a little difficult?—I do not suppose it would be plain sailing by any means.

5950. *Dr. Hyder* : If that were so, the main advantage of impartible holdings would remain, that no fragmentation and sub-division would occur?—The main advantage in my opinion is impartibility of cultivation.

5951. *Mr. Calvert* : Would you favour me with your opinion as to whether the teachings of the Agricultural Department have really got down to the small man?—Except in a very few cases I do not think so myself.

5952. On page 292 you give us some figures as to classification of holdings. Those figures refer, I presume, to owners?—Yes.

5953. If you had similar figures for cultivating units, cultivators' holdings, would you expect to have a lower scale than this? I mean are there more cultivators than owners in your district, or *vice versa*?—I should say there were more cultivators than owners but not so very many. I have no figures to show what the proportion is.

5954. Actually from an economic point of view the owners' holdings are immaterial: it is the cultivators' holdings we want to know?—I do not think so. The tenant does not get the same benefit from cultivating the landlord's land as he would from cultivating his own land.

5955. By cultivator I mean a man who cultivates in any capacity, as owner or tenant. Your cultivators would be somewhere below the 15 acres group, would they not? You have no people cultivating 500 acres?—No.

5956. And probably no people cultivating 100 acres?—Yes, we have.

5957. Single people?—The joint family.

5958. I mean individual cultivators?—It is hard to say what an individual cultivator is; most cultivators have a wife and children. A substantial number cultivate 100 acres or more.

5959. You have no 1,500 acres holdings?—No.

5960. So that really all that land in the two top groups goes down to the lower groups?—As regards units of cultivation, yes.

5961. So that your units of cultivation are probably bunched round the lower groups?—Yes.

5962. If you got an educated cultivator, an educated man of the cultivating class who was trusted by the people and put to propaganda work, steady persistent propaganda, year in and year out, do you not think he could wear down the opposition to consolidate, and produce results?—Yes, I think he certainly could.

5963. Practically the whole secret of the Punjab system is persistent propaganda, year in and year out, gradually overcoming the opposition?—Personally I think in many parts, for instance, in the Tapti Valley where the soil is largely uniform, it could be effected without any great difficulty now. It is in the villages where you get a small area of good soil and a large area of bad soil that it would require a great deal of propaganda before you could get anyone to come in.

5964. Assuming for the moment you had compulsion, and by compulsion you had brought about consolidation, that you had pleased 99 people and displeased the 100th, which do you think would shout the most: the 99 in your favour, or the one against you?—The one against us, certainly.

5965. Even among his neighbours the disgruntled man might do much more active propaganda than the 99 men who are contented?—Yes.

5966. *Mr. Kamat:* Have you got village panchayets in your district working well?—I cannot say they are working well.

5967. How many have you?—I forget.

5968. Can you tell me roughly?—Roughly I should say there were about 20. I really forget how many.

5969. They are not working well; is that because of apathy on the part of the people and lack of interest on the part of the Collectors?—Could not I take those two questions separately?

5970. Yes, if you like. Is it partly due to apathy on the part of the people?—Not so much apathy as dislike for direct taxation.

5971. And lack of interest on the part of the district officers?—I should deny that personally.

5972. Do you think these village panchayets might be stimulated by greater interest being taken in them by the Collectors?—Of course I do not admit your first point.

5973. Do you not think they could be very valuable agencies for village reconstruction?—I cannot give an opinion without more details, I am afraid.

5974. If, for instance, you called together your *mamlatdars* and asked them each to take a village to be made into a model village, with the help of the people, of course, could you not introduce amenities such as a village library, a good drinking water-supply, cleanliness, good surroundings and that sort of thing, so as to make an Indian village something like an English village?—If you had the funds you certainly could; the main difficulty is where you are to get the funds from.

5975. If you make a demonstration in the first place in one village could you not get the funds, people having seen what you want to do?—I have argued with the villagers of a good many village panchayets and tried to point out to them the things that are needed in their villages, and I am always met with the answer, "But we have no money to pay for it; we do not want the village panchayet, and we should be glad if it were abolished." I agree there are a few enlightened villages where the village panchayets are working, but even there their funds are very restricted.

5976. Have you not made any definite demonstration in a particular instance; for instance, if public welfare work were shown to be good, would it not catch on?—Without funds and without some agency for doing the work I am very doubtful. As Assistant Collector I have often had to lay out new parts of village sites in decent streets, allowing space for trees to be planted and things like that, but I have never yet seen any attempt made to keep up those amenities.

5977. So that you think the difficulties are not due to lack of interest either on the part of the people or of district officers?—The difficulty I think is disinclination of the villager to tax himself for communal purposes.

5978. Would not the village panchayets, if improved, be better instruments for rural reconstruction than the Taluka Development Associations?—I cannot give you an answer. I have seen Taluka Development Associations doing good work, and I am not in a position to say what improvement village panchayets might or might not do. The more people you can get to conduct propaganda for you, the better, obviously.

5979. Mr. Calvert asked you whether the Usurious Loans Act was in operation either on the part of the Presidency. Do you know that in addition to that we have got the Deccan Relief Act?—I know we have got the Deccan Relief Act.

5980. And that by that Act the Court may decree a reasonable rate of interest notwithstanding an agreement for a higher rate of interest between the moneylender and the cultivator?—Yes.

5981. They can also decree, in favour of the cultivator, that the repayment of the loan shall be by very convenient instalments spread over a number of years?—Yes.

5982. Mr. Calvert: Under that Act can the Courts make the moneylender give back to the borrower any excessive sum he has paid in interests?—I am afraid I do not know at all; I have never had to work that Act.

5983. Dewan Bahadur Malji: In your note you mention the lengthy execution proceedings and point out that execution proceedings have to be transferred to Collectors?—Yes.

5984. And these proceedings drag on for a number of years?—In some cases they certainly do.

5985. During the course of such proceedings do you ever farm out the attached lands and liquidate the debts?—I cannot say whether it is ever done; I have considered doing it.

5986. Doing farming business?—Yes, renting out the land. I think I have a case at the moment under enquiry, but I have not done it in any other cases so far.

5987. So that these provisions in the Civil Procedure Code are practically a dead letter; I mean farming; those provisions are generally not made use of?—As far as my experience goes, generally they are not.

5988. Another matter in which the agriculturist is at a great disadvantage is that, as you know, when the sale is conducted by the Collectors, the agriculturist is compelled to pay the sale fees according to the land revenue rules?—Yes.

5989. In addition to that, the High Court has provided for poundage at 5 per cent.?—Yes.

5990. Those fees are paid by agriculturists or non-agriculturists, but the agriculturist is at the greater disadvantage of having to pay poundage, so that he pays double fees?—I have just been looking into the matter and I find I have not been collecting poundage.

5991. Sir Ganga Ram: In your memorandum you often refer to economical and uneconomical holdings. What is the size you regard as being economical or uneconomical?—I am afraid that is a term I have used rather loosely; I refer to it as the area which can employ a cultivator who has one pair of bullocks.

5992. But what is its acreage?—In the light lands in the south of the district I take it as 20 to 22 acres.

5993. Is your district canal-irrigated at all?—It is only irrigated by *bunds* which take off from streams and give a certain amount of irrigated land. There is no regular canal irrigation. There are a few second class irrigation works and that is all.

5994. Is there any well-irrigation?—Yes, there is well-irrigation.

5995. When you say 20 to 22 acres, are you speaking of canal-irrigated land or well-irrigated land, or what?—No, that is the light soil in the south of the district, depending on rainfall only.

5996. Why is it that the number of people holding 100 acres is very much decreasing?—I imagine it is largely due to the natural increase of the population.

5997. That should have increased the cultivation?—I am afraid I have not followed the question.

5998. Do the people who own 100 acres employ tenants to do their tillage?—A good many do; others are undivided families and they work the land through their brothers and sons and hired labour.

5999. Do those who employ tenants receive payment in cash or do they participate in kind?—It varies; both systems are employed.

6000. In your note you suggest that uneconomic landholders had better be squeezed out as soon as possible. What do you mean by the word "squeezed"?—Be eliminated. Our experience is that the man with the small holding, if, as is often the case, he cannot get more land to cultivate as a tenant, cultivates his small holding very badly. It does not produce enough for him to live on, it hinders his getting employment as a labourer, and his condition goes from bad to worse.

6001. You say that unless the father by his will disinherits his children, the law prevails. Can he disinherit if the land is ancestral?—I do not know; I believe so, but I admit I do not know the Hindu law on the subject at all.

6002. In your district do these Loni school boys go back to their land or do they seek employment elsewhere?—I have not got any figures, but as far as I remember about half go back to their land and half try to get jobs elsewhere. I am not sure of that.

6003. You say in your note that tractor experiments should be made. I have just enquired from Dr. Mann the cost of one ploughing by tractor already established, and I am told it is Rs. 8 on heavy land and Rs. 4 to Rs. 5 on light land. Do you think the cultivators could stand that expense?—I am not prepared to give any opinion until we have had a tractor working.

6004. There is no question of experiment because the experiment has already been made?—They are, I understand, successful in Gujarat; tractors have been used there successfully.

6005. But can the people in your district afford it?—That is what I want to find out by experiment.

6006. In your note you speak of "made roads"; what do you mean by that?—Metalled roads.

6007. In your district does not the Forest Department allow free grazing in some places and at a small charge in other places?—Certain villages have the privilege of free grazing; that is, if there is forest available; but there is very often no forest available.

6008. If compulsory primary education is introduced, do you think they will forget all they have learned in two years? That has been the experience in other places?—I am afraid I am not an educationalist; I could not say.

6009. Are there any irrigation schemes on the *tapis* in your district?—There are none at present that are likely to be carried out. There are several which might be carried out.

6010. There are some which can be carried out?—I do not say they can be carried out profitably.

6011. No. but as a projected measure they can be carried out?—They have been projected in the past, but I do not know that Government will ever find us the money.

6012. But there are schemes possible?—Yes.

6013. Have you any idea what interest they would bring in?—I am afraid I have forgotten.

6014. *Sir Thomas Middleton*: You have already told us that you had a month's agricultural education at Poona and that you have forgotten all you learned. Reading your memorandum on animal husbandry I come to the conclusion that you have made very good use of that amount of education. I think you must have spent a great deal more time than a month in studying the difficulties which arise in a grazing area?—I did not study that at Poona.

6015. Perhaps you began to think about it after being at Poona?—Yes, I had to think about it.

6016. I read these remarks as referring to Western Khandesh chiefly?—Yes.

6017. You told Sir Ganga Ram that you expect a pair of bullocks in West Khandesh to cultivate 20 to 22 acres of light soil?—Yes.

6018. What do you take for the heavier soil?—I should say in the Tapti Valley roughly 15 to 16 acres.

6019. You put these figures in both cases rather higher than I should have expected?—I have not done it more than by a casual enquiry among villagers as to what bullocks would cultivate.

6020. It may be the approximate average in that area, but it is very much above the average for India. It has a bearing on the number of superfluous cattle that you have got in your district?—Yes.

6021. Your remedy is the drastic one of increasing the grazing rates and starving out the worthless animal from the overstocked grazings?—It is the remedy I should like to employ, but I do not think there is any chance of its being employed.

6022. You recognise that it is impracticable?—It is impracticable under present conditions.

6023. A little later you refer to the great increase in grazing which has been produced by the enclosure of forest on the Dhulia Road?—Yes.

6024. Short of the drastic remedy of starving, by putting up the prices to such an extent that worthless cattle would be kept off the grazing, would it not be possible to solve the difficulty in some such way as the following:—there are in each of the villages in your area a certain number of cultivators who have plough bullocks; there are probably a number of Bhils and others who may have next to no plough bullocks but who keep a few animals and overgraze the village wastes to such an extent that the cultivators' cattle have no chance whatever of picking up anything in the dry season. If some arrangement were made by which the cultivators could have reserved for themselves a certain area in proportion to their numbers, and a certain area were left to tribes like the Bhils whom you cannot expect to adopt a settled husbandry; do you think it would be possible to induce the better cultivators by showing them what has happened in enclosed forests, to go in for a system of rotational grazing on their own land? The result would be that if the aggregate amount of grazing on the enclosed area were doubled or trebled, as it easily might be with proper grazing, the benefits would be limited to semi-cultivators and not spread over the Bhils and other hill races whose cattle at present come into competition with those of the better cultivators. Do you think there is any possibility of some such arrangement?—I rather doubt it. What grazing there is in a village is looked upon as the common property of all the village cattle and, in any case, I should be very loth to adopt an arrangement which would put any stigma on the Bhils and other backward tribes whom we hope eventually to turn into settled cultivators.

6025. At present is it not their cattle that constitute the difficulty?—No, I do not think it is. The poor Bhil keeps goats and chickens. If he has any cattle it is usually one plough bullock, which he shares with another Bhil who has got another.

6026. Have you got many *kolis* in your district?—Very few *kolis*.

6027. Do most of your cultivators belong to the *patel* or *patidar* class?—The majority of the cultivators are of the more advanced Marathi, Gujar and Kunbi castes; but then (there is rather more than one-third of the area where the cultivators are almost entirely Bhils, Mauchis and Pavras.)

6028. The difficulty at present is that the Kunbis see no chance of making any improvement in their grazing area because of the encroachments of cattle belonging to others and I was wondering whether there was any possibility of reserving for more advanced cultivators, of whatever caste, a certain area of grazing land and persuading them to graze the land in rotation as is done in the enclosed forests?—We have to a certain extent made a move in that direction by trying to sell wire fenced *kurans* to villagers on an average of the last 3 years' prices. We managed to get rid of two out of four to the villagers. We had a big *kuran* but the villagers would not offer any reasonable price for it. They offered to pay for it by instalments, but the prospects of getting the money out of them eventually were rather doubtful. But there is that possibility that if you take the trouble to fence *kurans* you might then sell them to the better class villagers for their own cattle; but without that I doubt whether any villagers would be ready to come forward to buy an unenclosed area of forest, because they would find it so very difficult to keep other cattle out.

6029. On page 292 you say the social prestige attaching to land is a great factor in the desire to possess it. Is that a great factor?—I think it is, so far as my experience goes.

6030. It is not due to the fact that a man who has worked and cultivated land does not want to leave it?—No, the man who has land in the village is in every way more respected than a mere tenant. If a man gets into trouble and he wants to prove he is respectable, the first thing he tells you is that he has land of his own in his village.

6031. *Dr. Hyder*: You give certain figures on page 290. Do you say it will cost Rs. 750 to get a return of Rs. 1,000 if he grows cotton? Will you look at items (a) and (b)?—Does your item (b) "Working expenses until the next crop is ready," include the maintenance of the cultivator and his family?—Yes. I would explain that these are not my figures; they are given to me by cultivators. I disagree with them rather; to my mind they are placed too high. For instance, they allow for keeping a watchman. The ordinary cultivator starting in a small way would not keep a watchman; he would turn one of his family on to keeping a watch on the crop. (My own enquiries in giving out land for Bhils were that roughly a Bhil starting afresh required a capital of from Rs. 300 to 400, which he had to get from Government by borrowing, saving, illicit distilling, theft or somehow.)

6032. That does not include the price of the land?—No.

6033. That is free?—The Government was willing to give the land to backward classes free of occupancy price.

6034. So that if a Bhil in your tract accumulated Rs. 900, that would keep him going for 3 years?—I think it certainly should. I only took it until he got the crop in.

6035. If a Bhil had savings in the co-operative society amounting to Rs. 900, that would tide him over a period of scarcity or of famine for 3 years?—I think it certainly should.

6036. I suppose your district is not opened up by village roads on either Yes.

6037. I suppose your district is not opened up by village roads on either side of that road?—There are village roads to most parts of the district except one part which is only accessible by foot or small pack animals.

6038. I only use this as an illustration. Money cannot be raised to supply the people with wells and roads; the people look to the Government to supply them with money, do they not?—They certainly look to Government to give them money, yes.

6039. The Government cannot give them money?—I understand not.

6040. And they have not got any money?—That I do not admit; I think we could easily raise a loan of 10 lakhs if necessary in Khandesh for a North Tapti Road.

6041. I admit that they do not wish to part with their money?—They certainly do not wish to part with their money.

6042. As they do not wish to part with their money and the Government cannot give them money, I want to know from you as Head of the district what you think of this suggestion: that you conscript your people, that you say to them: If you want these things, pay a labour tax, repair the wells or tanks which have got silted up, and make up the roads by putting in so much labour per family; the Government do not want any money from you?—Yes, that plan has often been tried in digging village wells and so on. The usual rule in a village is for the Government to contribute one-third, the Local Board one-third and the village one-third. The villagers always say they are willing to give labour worth one-third the cost; but when you come to work out what they have done you find something has gone wrong, they have been busy with marriages or harvesting and they have not provided what they promised.

6043. That is on a voluntary basis?—Yes.

6044. But supposing they were conscripted for about 10 days when they had no agricultural operations to perform and were made to work, so many members of each family between the ages of 16 and 45?—I cannot say I like the idea.

6045. Do you think it would be undesirable from a political point of view?—I think it would be undesirable from every point of view, except that you might get better roads in the end.

6046. Owing to the fact that the people do not make the best use of their chief industry, agriculture, there are no funds available and they do not evince a liking for direct taxation?—No, but if you arouse sufficient enthusiasm I think the money could be raised. (There are two lakhs of Bhils in the district, and I have often had proposals from Bhils that I should collect an extra anna on each rupee of Government land revenue for the creation of a fund for Bhil education. The Government did not approve of such a voluntary-compulsory levy and so I cannot do it.

6047. They want to be educated but the Government are afraid?—You may put it like that; doubtless some Bhils would kick, but the great mass of them would not.

6048. *Sir Chunilal Mehta*: When was this proposal of an extra cess on the land revenue for the Bhils put up to Government?—I do not know that it has ever been put up to Government, but the offer was made some time ago by the Bhils themselves. It has been turned down I think by Government or the Commissioner on the analogy of the proposed cess for Mohammedan education in Sind. I have not put it up to Government myself, because I thought there was no prospect of getting it through.

6049. Was that in recent years?—Yes, quite recently. It originated before I became Collector, but the Bhils have often talked to me about it since.)

6050. So that you have not really had a definite decision from Government; you have not put it up to them?—No, I have not put it up to Government at all.

6051. You cannot tell what view the Minister would take with regard to it?—I can only judge from the Government's orders on the subject or the collection of subscriptions by officials.

6052. Have you any idea when those short courses for Assistant Collectors in the Agricultural College were abandoned?—I do not know at all.

6053. It was some years ago?—I do not know.

6054. Are you aware that about two years ago the question was again raised, and some arrangements have now been made by which some kind of training will be given to Assistant Collectors?—Yes, but I do not know what the details are.

6055. It is coming into force this cold weather. In answer to Sir James MacKenna you said that the diaries of the Deputy Directors were not submitted to you as Collector?—No.

6056. Are there any recent orders of Government by which the Deputy Directors are to prepare programmes, to inform the Collector of their tours in the districts and to get the Collector's assistance in calling meetings of all the Revenue officers and the leading people in the district in order to carry out those programmes?—Yes, there are recent orders for co-operation between the two departments, though I am not prepared to say what the exact details of it are.

6057. Have the Deputy Directors approached you?—Continually, yes.

6058. In fact, Khandesh is one of the districts where the co-operation between the Agricultural and Revenue Departments is excellent?—That I could not say; I do not know what it is in other districts.

6059. But in your district it is very good?—I think it is all right at present; I have certainly got on very well with the agricultural people.

6060. Have you any experience as to whether roads under the District Local Boards have deteriorated or not?—There are very few of them in Khandesh and those I know are full of large holes; but whether they have deteriorated recently or not I cannot say.

6061. The District Local Boards have certain money at their disposal; do you think they are giving a fair share of that money to the roads?—It is very difficult to answer; it involves evaluating the claims of health and education as against those of communication. I imagine any District Local Board would be perfectly justified in setting its own value on the three factors and allotting its money accordingly.

6062. That is really what I should like to know: whether the District Local Boards, judged by your standard, give a fair proportion of their resources to education, village health, sanitation, roads, and so on?—On the whole I should say yes; but I personally would spend more money on roads at present under the circumstances of the district. In other districts probably it is not needed.

6063. Would you place roads in front of education in your district?—That is a political question I would rather not answer.

6064. Do the Local Boards receive substantial financial assistance from Government?—Yes.

6065. Have you had occasion to compare the assistance given by this Government with that given by other Governments?—No.

6066. You have never examined that question?—No.

6067. On page 289 you say the best times for the labourer to earn money as a hired worker are when he must be looking after his own crop. What are you referring to there?—I mean that if a man has a field of cotton of his own ready for picking, he must pick his own cotton first, though in the same village there is probably a rush to get labour for a larger cultivator's crop and he would get more money if he could neglect his own field and pick somebody else's cotton. He misses his opportunity of getting the best rate of wages for picking cotton.

6068. That would make it all the more desirable, would it not, that in his spare time he should have some other occupation besides agriculture?—Yes.

6069. You have referred on page 294 to spare-time subsidiary occupations?—Yes.

6070. It is your opinion that the extension of well-irrigation would afford the best kind of occupation for cultivators; it would occupy his time during the whole of the year?—Yes.

6071. But there are physical limits, apart from financial, to such extension?—Yes.

6072. What kind of occupation would you suggest, therefore, for those places where well-irrigation was not possible?—(The main subsidiary occupation in Khandesh at the present time is illicit distillation) but I cannot suggest that! Frankly, I have been unable to think of a suitable occupation. To my mind, you must have an occupation which is fairly interesting, or it does not do a man any good, and you must have an occupation which is profitable. As far as my experience goes, it is difficult to think of an occupation which will be profitable unless you have a demand for the product; and with the present marketing facilities in the districts it will be extraordinarily difficult to find a product which will pay the cultivator. I had an experience the other day which bears on the point. The local Mahars weave cloth, and they came to me with a petition to the effect that their traditional occupation of weaving this cloth was now going, and no one would buy it. Some *patels* were there with me and I asked them why this was, and they said the cloth was more expensive and did not wear so well. I had no answer to give; if the local consumer will not take the product, a man is wasting his time making it.

6073. Are the cultivators weaving *khaddar* (coarse cloth) at all?—I do not know of any. It is a traditional occupation of the Mahars in the villages.

6074. The Mahars have some land to cultivate as well, have they not?—Some have and some have not.

6075. So part of the hand-weaving would be done by cultivators?—Yes, but it seems to me no use their going on weaving if they do not get some profit on it. They could not get a profit, because the local people said the cloth did not wear and was too expensive.

6076. You recently had a Government weaving school going round your district?—Yes.

6077. Did they tackle these Mahars?—I could not say.

6078. I do not think they did. If weaving amongst people of that class was improved and they were shown better methods of doing their work, that might afford some relief to this languishing industry?—It might, but is not a thing I should be willing to be definite about.

6079. Have you examined this question?—Not beyond the mere statement of the Mahars, confirmed by the villagers, to which I have already referred.

6080. None of your Taluka Development Associations take an interest in a matter like that?—I do not know that any Taluka Development Association takes an interest in Mahars' weaving. The District Local Board tried to introduce weaving in primary schools and held a school for primary school teachers last hot weather, but I do not know whether it will be a success. I merely mentioned this to show that I had been unable to think of a subsidiary occupation which appeared likely to be successful. Although to all appearances weaving should be successful, the actual weavers complained it did not pay them and I cannot think of any other subsidiary occupation for which sufficient demand and marketing facilities exist to make it pay.

6081. How long has this weaving been going on?—It is a traditional occupation.

6082. There is no reason why it should suddenly collapse now?—I suppose it depends on the demand and the price of cloth elsewhere.

6083. There are always ups and downs in a trade. Do you think this question has been sufficiently examined?—No. I merely want to point out that I have not got a remedy; I cannot suggest any subsidiary occupation. personally, I find it very hard to think of one.

6084. Would you consider hand-weaving as an auxiliary occupation is a matter for investigation?—It is certainly a matter for examination.

6085. You have the cotton on the spot; there are mills from which the yarn would be available; and weaving has been a traditional occupation for centuries. Is there any reason for a sudden falling off?—I do not know. I merely have the statement of the weavers to go on. That was very likely coloured by the fact they wanted land and it was a good excuse; but the local villagers confirmed the fact they did not buy the cloth they used to.

6086. There are a good many weavers in your district?—In Dhulia itself, yes.

6087. Weaving all kinds of cloth, both fine and coarse?—No. They are nearly all concentrated in Dhulia, and they weave the ordinary stuff, nothing particularly fine.

6088. Have you at any time examined the business working of this hand-weaving business?—No, I have never gone into that in any detail.

6089. I mean, such questions as where they buy the yarn, how they sell the cloth and their credit arrangements?—No I have not gone into that at all.

6090. *Sir Henry Lawrence*: From the point of view of the interests of the ryots in your district, which do you consider most necessary, better roads or schools?—The primary need is better roads, because unless the ryot has an opportunity of going about I do not think he will make any use of what he learns at school. You have to educate the people not only by books but also by environment.

6091. Can you get about your district in a motor-car?—No. I can get about parts of it in a Ford.

6092. The village roads are good enough for that?—Not all of them, by any means.

6093. What proportion of your district can you move about in in a motor-car, or rather a Ford?—It is difficult to say. The trouble is one can get along all right for 5 or 6 miles, and then you come to a place you cannot possibly get over without having the car carried.

6094. *Mr. Kamat*: Do you mean the roads are not good enough for British cars?—They are not good enough for any cars at all, but they do all right for Fords.

6095. *Sir Henry Lawrence*: You have a provincial road running from north to south?—Yes.

6096. Have you a provincial road running from east to west?—Yes, there is one to Nandurbar which joins the Agra road.

6097. *The Chairman*: I have just two questions to ask. Did you say in answer to Mr. Calvert that cultivators in debt who were unable to pay occasionally worked as labourers for the lender of the money?—The backward tribes usually do; it is their sole method of obtaining credit, to agree to work off the debt by labour.

6098. So many days' labour, is that the term of repayment?—Usually a Bhil gets into debt because he wants to get married. He borrows Rs. 80 from a *patel* and agrees to serve him for a year for that sum. He gets the cash in advance, and he is supposed to work for a year.

6099. If he does that he liquidates his debt altogether?—Yes, but usually he wants some clothes or something and goes on borrowing from the *patel*, so that eventually he stays for years working for him or is a *badmash* and bolts.

6100. *Dr. Hyder*: Does he get food from his employer?—The Bhil usually does. The higher castes usually get higher cash wages and no food.

6101. *The Chairman*: Do you think it would encourage interest and activity in agricultural matters if cultivators whose methods are outstandingly good or who take an active interest in propaganda in the district were to receive some small tangible reward in the shape, perhaps, of a medal or something of that sort?—It would certainly be appreciated.

6102. Is it done at all in your district?—I do not know of it in agriculture. I have had to distribute for the Veterinary Department one or two medals to people who particularly helped them.

6103. Were they appreciated?—Yes. In fact, one gentleman wanted a much larger medal than we could afford to buy, so he said he would pay the balance himself.

(The witness withdrew.)

**Mr. F. B. P. LORY, I.E.S., Director of Public Instruction,
Bombay Presidency.**

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—As the outcome of the enquiries instituted by the Government of India in the year 1917 with a view to adapting the teaching in Primary schools more closely to the needs of children of the agricultural classes, Government determined that provision should be made for an alternative curriculum, of a semi-agricultural nature, for Primary standards V—VII.

2. It must here be stated that the classification of Primary education followed in this Presidency differs from that in other Provinces. In this Presidency all purely vernacular education is classed as Primary. Our Primary course consists of an Infant class and seven standards. The three upper standards of the course would in all other Provinces be classed as Vernacular Middle, which they really are. The qualification for admission to a Secondary (Anglo-vernacular) school is having passed the IVth vernacular standard.

3. In issuing orders for an alternative course for Primary standards V—VII Government declared that they had definitely resolved not to introduce a vocational bias into the Primary course until standard IV had been completed, it being recognised that, though all education should aim at fitting the child for the part he has to play in life, the object in view in the first five years should be to make a child literate, and that the schools should concentrate on this purpose.

4. I attach a copy* of the alternative agricultural curriculum sanctioned by Government in 1923 for standards V—VII. For want of a better name the curriculum is generally known as "Agricultural bias." Government definitely decided not to experiment with a purely agricultural course such as that which had been adopted in the Punjab, but that the object should be solely to add an agricultural bias to the ordinary Primary standards. I attach a copy* of the letter also (for Marathi schools).

5. Work according to the new experimental course was started in 1923 in a few selected village schools in different parts of the Presidency. For the agricultural work teachers have had to be specially trained. The method adopted was to select teachers belonging to the agricultural classes and to send them for nine months' special training to one of the agricultural schools maintained by the Agricultural Department in three different Divisions. From Sind selected teachers were sent for special training to the Agricultural College at Lyallpur. There were forty-three of these schools in existence on 31st March, 1926, attended by 1,451 boys (this being the number of those in the agricultural bias classes proper, and excluding those in the lower classes). Twenty additional classes are being opened this year.

6. Each class is supplied with one agricultural teacher who replaces one member of the ordinary staff. The practice followed has been to select as a rule a man with a second year training certificate (pay Rs. 35 to Rs. 50) and to give him the pay of a third year trained man (Rs. 40 to Rs. 60). The training of each teacher covers a period of nine months and involves an expenditure of Rs. 350 (for substitute's pay, etc., and stipend to the deputed teacher).

* Not printed.

The average extra cost of an agricultural bias class over that of an ordinary Upper Primary class is represented by—

	Rs.
(1) The difference between the pay of a 2nd year and a 3rd year trained teacher per annum	72
(2) Contingencies (hire of bullocks, purchase of seed and manure, etc.)	240
(3) Wood for carpentry work, iron and fuel for smithing	50
(4) Rent for class accommodation and field	84
	446

say Rs. 450.

The figure for Sind is Rs. 772, owing to higher expenditure on the hire of cattle, cost of water, manure, etc.

In addition to this there is an initial expenditure of Rs. 200 for agricultural implements and Rs. 225 for carpentry and smithing tools.

Taking 45 as the average number of boys in an agricultural bias class (standards V—VII), the average recurring cost per pupil is Rs. 10 per annum (in the Presidency proper). To this must be added Rs. 17, the average cost of educating a boy in a District Local Board primary school. Thus the total annual expenditure per pupil in an agricultural bias class is Rs. 27.

In most of the places the villagers have given a plot of land free of rent or at a very cheap rental. The size of the plots varies from half an acre to one acre. The practical work is done by the boys under the guidance of the agricultural teacher, and no servants are ordinarily employed for the work. So far as I am aware, each boy is allowed to take the produce of the plot allotted to him.

The teacher of agriculture is so far in every case an assistant, owing to the fact that the men specially selected for the purpose were comparatively junior.

7. As explained in my reply to question 23, the curriculum of these classes leads up to the Vernacular Final examination, a special alternative syllabus for that examination having been sanctioned for boys who have been trained in these classes. The examination according to this alternative syllabus was held this year for the first time, and I have not yet received complete information as to the result. It is clearly too early to attempt to discover what the after-career of the boys who have been through the course is going to be.

Adult education.

8. Attempts have repeatedly been made to educate the adult population in the villages by means of night schools. In the past these attempts have generally been met by failure. A special attempt in this direction was made by the Co-operative Department a few years ago with the assistance of funds specially provided by a well-known philanthropist. These schools had to be closed in 1924, after an existence of two or three years, owing to the provision for their maintenance ceasing. They had not, it would appear, been very successful in securing the purpose in view, and that in spite of the fact that special Inspectors were appointed for their supervision.

It would appear that the teacher is the principal factor in the question. The work is uncongenial, but, if the teacher is the right sort of man, and if it is made worth his while to make a night school a success, there is every prospect of night schools being conducted with success.

9. Special attempts have been made in this Presidency to assist the spread and progress of education by means of Visual Instruction. The Educational Department maintains nearly a hundred magic lanterns, under the supervision of a special officer, the Deputy Inspector of Visual Instruction. The inspecting staff in each district is supplied with one, two, or three lanterns

and during the course of their tours they give lectures at which not only the school children but the villagers attend. It is reported that these lectures as a rule arouse considerable interest. In this branch of its activities the Education Department works in close co-operation with the Agricultural Department, as well as such other departments as the Department of Public Health, the Co-operative Department, etc.

I hold the view that a most useful purpose would be served if the magic lantern and the cinematograph were more extensively employed in educating the village classes. The first need is to encourage a desire for improvement in agriculture, and this can best be done by bringing home to the people how unsuccessful generally are the results of their own agriculture and by showing them how better results have been attained in other countries by care and thought, and chiefly by the adoption of scientific method. I advocate an intensive campaign on these lines, with lecturers specially trained for the purpose.

QUESTION 23.—GENERAL EDUCATION.—1. In my reply to question 2 I have given an account of the agricultural bias classes started with a view to adapting the work in the primary schools more closely to the needs of the agricultural community. The main points in respect of which the ordinary primary curriculum is unsuitable for the children of this community concern either the curriculum or the teachers. In considering the curriculum, it is necessary to deal separately with the true primary standards (I—IV) and those which would elsewhere be classed as middle (vernacular). In the former, as already stated, the main object both in village and town schools is to make the children literate, and the schools therefore concentrate on the three R's with the addition of Hand-work, Drawing, and Nature Study (where there is a trained teacher). The curriculum in itself therefore cannot in these early standards be regarded as unsuitable for children of the agricultural classes. It cannot, however, be doubted that the curriculum of the higher vernacular standards (V—VII) is not well suited to the needs of the children of agriculturists, and it was in recognition of this fact that Government decided on opening the agricultural bias classes of which I have already given an account.

2. One particular in respect of which the education given in the village schools is unsuitable both in the lower and the higher standards is the Readers, which are, it must be admitted, not altogether suited to village children. The chief defect lies in the language used, the books being largely written in language too advanced for village children. The question of getting fresh Readers prepared is, I may state, under the consideration of Government.

3. But far more important than the curriculum is the agency by which the teaching is conducted—the teachers. The old complaint that the teaching is literary rather than practical is chiefly due to the methods of instruction followed by the average teacher, partly because his own attitude towards life and nature is based on convention and tradition, and partly because he teaches in the way in which he himself was taught. The solution lies in the training of our teachers. The teachers must be men who go to nature and to life for their facts and will teach their pupils to do the same. It is probably essential that those who are to teach the children of agriculturists should be men who belong to the rural classes; it is certainly essential that they should have been educated and trained in a rural atmosphere. Our present Training Colleges are all held in urban surroundings. The need for a Training College in rural surroundings for training teachers for village schools is fully recognised by Government, but at present they are unable to provide the means for establishing such an institution.

4. But, just as the chief problem for the educationist is first to make the village masses literate and then to keep them literate, so the chief problem of the statesman is, or should be, to keep the best agriculturists on the land. The common attitude towards education is not as a thing that everyone should have for its own sake but as something which should be acquired as a means to a further end, that of bettering oneself. And here, as in England, the

agriculturist's usual idea of the best way to better himself is to cease to be an agriculturist at all. The number of boys who after passing the IVth vernacular standard either continue to study in vernacular standards V—VII and then appear for the Vernacular Final examination (the qualification for a primary school teacher and for the lower grades of the Public Service) or else take to the study of English (even a smattering of which commands a value in industrial centres) is continually increasing. Few boys who have studied up to the VIIth vernacular standard or have gone far in an Anglo-Vernacular school are content to go back and work in the fields. The best pass the Matriculation examination and become clerks, or go on to the University. Thus the country is drained of its most intelligent young men, and it is those with less intelligence that get left on the land.

5. How far the agricultural bias classes which we have commenced to open will help to counteract the tendency to which I refer, it is difficult at present to predict. It is generally agreed that the classes have so far been successful, and they are undoubtedly popular. It is, however, a question whether many of the boys who have completed the course in one of these classes will be content to remain on the land. It was found necessary (in order to induce boys to join the classes, it must be admitted) to give them an opportunity of appearing for the Vernacular Final examination, a specially modified alternative syllabus being allowed in their case. It is likely that most of those who pass this examination will become teachers, or village accountants. But at least we may hope that those who complete the course are not thereby unfitted for agriculture and that most of those who fail to pass the Vernacular Final examination will take up agriculture as their occupation, and we may further hope that the course they have been through will have made them better agriculturists.

Statement showing the expenditure on various kinds of

	TOTAL EXPENDITURE FROM				
	Government funds.	District Local Board.	Municipal funds.	Fees.	Other sources.
1	2	3	4	5	6
	Rs.	Rs.	Rs.	Rs.	Rs.
University	11,78,228	5,800	1,05,330	17,95,959	4,40,002
Per cent. of expenditure	33.4	.1	3.0	51.0	12.5
Secondary schools	22,12,234	20,122	1,92,746	32,44,725	13,70,763
Per cent. of expenditure	31.4	.3	2.7	46.0	19.6
Primary schools	1,14,84,237	7,60,153	39,03,056	5,97,913	13,56,797
Per cent. of expenditure	63.5	4.2	21.6	3.3	7.4
Special schools	12,67,059	44,713	1,02,399	2,71,693	3,99,142
Per cent. of expenditure	61.1	2.0	4.9	13.0	19.0
Total (Direct)	1,81,41,753	8,30,288	43,08,531	59,10,290	35,72,704
Per cent. of expenditure	52.5	2.7	14.0	19.2	11.6
Direction	1,49,851	..	..	..	69
Per cent. of expenditure	100	..	..	..	0.0
Inspection	11,79,756	..	..	..	224
Per cent. of expenditure	100	..	..	..	0.0
Other indirect expenditure	17,66,878	4,53,877	22,52,254	3,13,306	7,69,726
Per cent. of expenditure	31.8	8.2	40.5	5.6	13.9
Total (Indirect)	30,96,485	4,53,877	22,52,254	3,13,306	7,70,019
Per cent. of expenditure	44.9	6.6	32.7	4.6	11.2
GRAND TOTAL	1,92,38,243	12,84,165	65,55,785	62,24,096	43,42,723
PER CENT. OF EXPENDITURE	51.2	3.3	17.3	16.4	11.8

DIX A.

institutions in the Bombay Presidency in 1925-26.

TOTAL	No. of pupils on 31st March, 1926.	COST PER SCHOLAR FROM					TOTAL
		Government funds.	District Local Board funds.	Municipal funds.	Fees.	Other sources	
7	8	9	10	11	12	13	14
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
35,24,819	9,883	110	1	11	181	45	357
100							
70,46,500	98,569	23		2	35	15	75
100							
1,81,02,156	9,13,168	13		4		2	19
100							
20,85,006	20,461	62	2	5	13	19	101
100							
3,07,58,571	10,37,061	16	1	4	6	3	30
100							
1,49,920	..	..	..	..	..	..	..
100							
11,79,960	..	..	..	..	..	..	..
100							
65,56,541	..	..	..	..	..	..	..
100							
68,86,441	..	..	..	..	..	..	..
100							
3,76,45,012	10,37,061	19	1	6	6	4	36
100							

APPENDIX B.

Statement showing the number of pupils in the various kinds of recognised institutions in the Bombay Presidency on 31st March, 1926, and their classification by communities.

	HINDUS.				Mahom- medans.	Others.	TOTAL.
	Advanced.	Intermediate.	Backward.	TOTAL.			
University	6,887	766	100	7,753	467	1,643	9,863
Secondary Schools	45,735	15,323	1,449	62,507	7,544	23,518	93,569
Primary Schools— Upper Primary	25,242	33,135	6,306	64,683	10,653	1,597	76,933
Lower Primary	198,410	358,578	161,651	658,639	149,402	28,194	836,235
TOTAL PRIMARY	223,652	391,713	107,957	723,322	160,055	29,791	913,168
Special Schools	6,458	3,583	2,644	12,685	5,477	2,299	20,461
GRAND TOTAL	282,732	411,385	112,150	806,267	173,543	57,251	1,037,061
TOTAL POPULATION	1,917,055	9,156,979	4,075,849	15,149,883	3,775,098	366,738	10,291,719
Percentage of pupils to population	15.1	4.6	2.8	5.4	5.1	15.6	5.6

APPENDIX C.

Table showing the total number of District Local Board Primary Schools and the number of one man schools in 1925-26.

	NUMBER OF PRIMARY SCHOOLS.			NUMBER OF ONE MAN SCHOOLS.		
	Boys.	Girls.	TOTAL.	Boys.	Girls.	TOTAL.
District Local Board . . .	8,711	653	9,364	4,779	244	5,022

APPENDIX D.

Note regarding pay of primary school teachers in force in the Bombay Presidency in 1926-27.

	Presidency Proper.	Sind.
	Rs.	Rs.
(1) Unqualified teachers . . .	20	25
(2) Qualified teachers (passed Vernacular Final Examination).	25-1/5-30	30-1/5-35
(3) First year trained teachers . . .	30- $\frac{1}{2}$ -35- $\frac{1}{2}$ -40	35- $\frac{1}{2}$ -40- $\frac{1}{2}$ -45
(4) Second year trained teachers . . .	35- $\frac{1}{2}$ -45-1-50	40- $\frac{1}{2}$ -50-1-55
(5) Third year trained teachers . . .	40- $\frac{1}{2}$ -50-1-60	45- $\frac{1}{2}$ -55-1-65

2. In addition, Head teachers get an allowance which is based on the average attendance of the school during the preceding two years, and which varies from Rs. 5 to Rs. 25 per mensem according as the average attendance varies from 0 to 300 and more, the rate of allowance being Rs. 5 per mensem for every 75 pupils or fraction of it.

APPENDIX E.

Statement showing the number of trained and untrained teachers in Government, District Local Board and Municipal Primary Schools in the Bombay Presidency on 31st March 1926.

Division.	Trained.	UNTRAINED.		TOTAL
		Qualified.*	Unqualified.	
Bombay Division	2,955	2,021	691	5,667
Central Division	4,420	3,844	394	8,658
Northern Division	3,940	1,782	156	5,878
Southern Division	3,535	1,067	187	4,789
Sindj	2,051	774	90	2,915
TOTAL NO. OF TEACHERS	16,901	9,488	1,518	27,907
PERCENTAGE TO TOTAL	60.6	34	5.4	100

* Viz., passed Vernacular Final Examination.

APPENDIX F.

Table showing the Expenditure, etc. of the several Provinces in India in 1923-24.

Name of Province.	NUMBER OF PUPILS.		Population.	Percentage of Primary pupils to population.	Percentage of total pupils to population.	EXPENDITURE ON PRIMARY SCHOOLS.					
	In Primary School.	In all Institutions.				Government funds.	All other sources.		TOTAL.		
							Rs.	Per cent.	Rs.	Per cent.	Rs.	Per cent.
1	2	3	4	5	6	7		8		9	
1923-24.											
Bombay Presidency	835,921	947,061	19,291,717	4.3	4.9	1,10,42,991	66	56,43,729	84	1,66,86,720	100
1925-26.											
Bombay Presidency	913,168	10,37,061	19,291,717	4.7	5.4	1,14,84,237	63	66,17,919	87	1,81,02,156	100
1923-24.											
Madras	1,771,692	1,980,605	42,318,985	4.2	4.7	65,78,409	52	61,61,392	48	1,27,39,801	100
Bengal	1,555,341	2,009,827	46,695,586	3.3	4.3	20,04,895	34	38,29,310	66	58,34,205	100
United Provinces	999,287	1,082,012	45,375,787	2.2	2.4	57,25,292	65	31,00,746	35	88,26,138	100
Punjab	561,186	752,806	20,685,024	2.7	3.6	22,99,736	88	36,73,129	62	59,72,865	100
Burma	276,485	238,569	13,212,192	2.1	2.6	61,472	2	25,36,343	98	25,97,815	100
Bihar and Orissa	776,745	866,191	34,004,546	2.3	2.5	1,76,847	4	41,95,539	96	43,72,386	100
Central Provinces	319,224	345,447	13,912,760	2.3	2.5	21,57,989	57	16,11,980	43	37,69,969	100
Assam	208,446	237,353	7,606,230	2.7	3.1	7,66,070	62	4,60,050	38	12,26,720	100
North-West Frontier Province	37,542	49,190	2,251,342	1.7	2.2	4,10,141	76	1,27,966	24	5,38,107	100

APPENDIX F—contd.

Table showing the Expenditure, etc. of the several Provinces in India in 1923-24—contd.

Name of Province.	TOTAL (DIRECT AND INDIRECT) EXPENDITURE.						Percentage of columns 7 to 10 (i.e., Government expenditure on Primary Education to total Government expenditure on education.)	Percentage of columns 9 to 12 (i.e., total expenditure on Primary Education to total expenditure on education.)
	Government funds.		All other sources.		TOTAL.			
	10	11	12	13	14			
1	Rs.	Per cent.	Rs.	Per cent.	Rs.	Per cent.	13	14
1923-24.								
Bombay Presidency	1,89,55,834	53	1,38,47,452	42	3,28,03,286	100	58	51
1925-26.								
Bombay Presidency	1,92,38,248	51	1,84,06,769	49	3,76,45,012	100	60	43
1923-24.								
Madras	1,67,13,404	45	2,02,87,097	55	3,70,00,501	100	39	34
Bengal	1,30,09,486	38	2,14,38,821	62	3,44,48,307	100	15	17
United Provinces	1,62,57,109	54	1,28,93,848	46	3,01,50,257	100	5	30
Punjab	1,13,15,754	62	1,02,38,121	48	2,15,53,875	100	20	23
Burma	61,24,418	46	70,88,932	54	1,32,13,350	100	1	20
Bihar and Orissa	43,05,947	36	77,67,182	64	1,20,73,129	100	4	36
Central Provinces	53,02,455	60	35,33,318	40	88,35,773	100	41	43
Assam	22,36,226	60	14,86,821	40	37,23,147	100	35	33
North-West Frontier Province	10,46,717	63	6,13,442	37	16,60,159	100	41	32

Oral Evidence.

6104. *The Chairman:* Mr. Lory, you are Director of Public Instruction in this Presidency?—Yes.

6105. You have put in a very interesting note, for which the Commission is greatly obliged, and which we have had an opportunity of reading. We have also received a correction to certain figures on the first two pages, and this has been incorporated. I do not know whether you would care to make a general statement at the outset, or shall we proceed at once to question and answer?—I have nothing to add to what I have already written.

6106. How many agricultural bias schools have you?—Sixty-three. There were 43 until quite recently, when we opened 20 more.

6107. How long has the oldest agricultural bias school been in existence?—8 years. We started with 20 in 1923.

6108. Have you yourself come to any view at all as to whether the prime purpose of these schools (namely, to educate these boys without unsettling them for the land) has been achieved or is likely to be?—No. It is early yet to come to any conclusion, but everyone with whom I have discussed that point agrees that this course will at any rate unfit them less than the ordinary vernacular middle course (what we call upper primary) for agricultural pursuits.

6109. The tendency of education to unsettle a rural population and cause migration towards rural centres is not merely an Indian problem?—No; I have said that in my note.

6110. It is a world problem for which, apparently, no one has yet discovered the complete solution?—It is true we have had the same problem in England, but, after all, in the last hundred years England, from being an agricultural, has become an industrial country, whereas India will, I imagine, remain for very many years to come predominantly an agricultural country.

6111. Do you think there is any danger at all that the agricultural bias schools may teach a boy nature study at the expense of the three R's, that is of literacy?—A boy has already attained literacy before he enters an agricultural bias school; he has already been at school 5 years.

6112. So you do not think there is any danger that on the purely educational side the agricultural bias schools may fall short of the schools which have not the same curriculum?—No. There is no danger in the case of those particular schools.

6113. At what age do your boys here go to school?—They start at the age of 6.

6114. In the elementary schools?—Yes. That is the school-going age.

6115. How about nature study in those schools?—Nature study is in the curriculum. In practice it is generally taught in those schools in which there is a trained teacher, and in those only—a man who has been through a course of training in what we call here a 'Training College,' but which in other parts of India is generally known as a 'Normal School.'

6116. So far as elementary education is concerned, is there any danger that this attempt to create an interest in agriculture and nature generally may prejudice literacy?—I would differentiate between the two. It is possible that if boys were taken away to work on a field, that might interfere with their ordinary work; but I do not think there is anything to fear, if they attend regularly and if the teaching is efficient. If a boy attends school pretty regularly and works for 4 hours a day we can make him literate. What happens, however, is that he does not attain anything like that standard of attendance, and he does not get proper teaching. A school taught by an untrained teacher is probably a one-man school, and in those schools there is a danger that if field work or agriculture were taught in addition to the ordinary subjects the latter might be interfered with. As I said, in the case

of such schools nature study is not taught as a rule. Now, with the exception of one or two schools (one of which the Commission saw the other day, and which is not typical), agricultural is not taught at all in the first 4 or 5 years.

6117. You will probably agree with me that the possibility of a conflict between literacy and agriculture or nature study (call it what you will) is a thing which should be carefully guarded against, and if there is such a conflict literacy should be the prime objective?—I agree with you entirely. I have said in my note that literacy is and must be the first consideration in the elementary standards; we should concentrate on the attainment of literacy.

6118. I suppose one of your chief difficulties lies in training your teachers? How are the teachers who undertake the training in agricultural bias schools themselves trained?—A teacher in an agricultural bias school is a man who has first passed the Vernacular Final examination and then done 2 years in one of our ordinary training colleges for primary teachers. He then goes for 9 months for special training at one of the agricultural schools under the Agricultural Department, such as Loni.

6119. I thought, from an answer Dr. Mann gave the Commission, some change in the method of training these teachers was contemplated?—It is true that if we accelerate the rate of opening these agricultural bias schools Dr. Mann will not be able to train all the men we shall require. At the present time he trains about 20 every year. I fancy what Dr. Mann was referring to was the fact that we are trying to start a rural training college; i.e., a normal school in rural surroundings.

6120. How far has that project gone?—I had a small project which I put up to Government and asked them for sanction to move a one-year training school from an urban centre to a rural district 5 or 6 miles away. It was not possible to carry it out; but I hope to be able to carry out the idea in the case of one of these particular schools. It is not a full training college, but only a one-year normal school. In the case of our main training colleges the difficulty is to get buildings. We should have to put up large new buildings in some rural spot, and I cannot get the money for that.

6121. You mentioned the Loni school just now. I understand that is under the Agricultural Department?—Yes.

6122. Are you familiar with its working?—I have been there two or three times.

6123. Are you an advocate of the principle it represents?—I think the idea is excellent.

6124. Do you know whether it has made any impression on the cultivators in the immediate neighbourhood of the school?—I know this, and it must be common knowledge to them, that since the farm took over that particular site the land has been very greatly improved. How far the teaching the school gives to its pupils is improving the agriculture of the neighbourhood, however, I cannot say.

6125. In this matter of attempting to spread literacy among the rural population, do you think the fact so many of these boys leave school early and return to entirely illiterate homes, where there is neither the example which would come from literate parents nor any reading matter on which to practise, makes it likely that adult education, if it could be achieved, would make an important contribution towards the general spread of literacy?—Various experiments have been made to try to teach the adult population of the villages to read and write, but they have not been successful. I would not give up trying, however. The experiment was tried some years ago by the Co-operative Department, but that had to be given up because the funds which had been supplied for the purpose became exhausted. I think the Co-operative Department would be a very suitable agency to undertake the work.

6126. I am very anxious to get from you whether you think the fact that so many homes are illiterate is an important reason for the relapsing into

illiteracy of boys who leave school literate, but at an early age?—Undoubtedly it is one important reason.

6127. So that the advancement of adult education, if it is possible, would be most important?—Yes.

6128. It would be a most valuable contribution?—Certainly.

6129. Having regard to that, do you feel a sufficiently determined effort over a sufficiently long time has been made in order to ascertain whether adult education can be pressed forward?—No. I think that though attempts and experiments have been made they have not been as sustained as they might have been. I certainly think more might be done.

6130. Are there any schemes on foot at present?—Yes. We have a good many night schools in the Surat district, which I am told are prospering. They are partly for children and partly for adults, and the scheme is assisted by funds given by a philanthropic gentleman in Bombay. The trouble in all this business is the personnel. Not only the local but the intermediate directing personnel is always changing. An officer starts something of this sort and then he is transferred.

6131. Is not there a hope that if you could achieve adult education and so increase literacy in any one village up to, say, 50 per cent. of the population, future generations would be able to maintain their literacy, and the same measure of expenditure on adult education would become unnecessary?—Quite.

6132. So there again there seems to be a good reason for making a determined assault on the present position of illiteracy by means of adult education?—Especially if this is done in villages where the standard of living of the people and their material condition are fairly advanced.

6133. Do you feel hopeful that if some such scheme were attempted success could be achieved?—Not generally. I think it could be done in certain places, where, if it was watched, it could be made successful. But, taking the whole countryside, I do not think you could carry this through, though of course you could carry it through if you concentrated on it and had the requisite amount of money.

6134. You mean to say that any means you can see in prospect would be insufficient to deal with the matter?—Yes.

6135. What about the education of females? Is the attendance of girls at schools increasing at all?—It depends very largely on the community. It is in some communities but not in others. Gujarat was very much advanced in this respect 50 or 60 years ago compared with the rest of India, but it does not seem to have made since then the progress one might have thought. I am speaking, of course, of rural areas in particular.

6136. The movement has not assumed important proportions?—No.

6137. Is there any sign of women taking an interest in night schools or adult education generally?—No, not that I know of, except where you have a movement such as the *Seva Sadan*, which is confined chiefly to urban or semi-urban areas. I suppose they get women in from the districts to a certain extent.

6138. *Sir Ganga Ram*: In several places in your memorandum you refer to the Punjab system?—Yes.

6139. Have you derived that information first-hand by visiting the Punjab?—No.

6140. In regard to female education, have you a sufficient number of women teachers?—No, we cannot get sufficient.

6141. Is that the impediment to the expansion of women's education?—Partly. Even if we had more I do not see we could do very much more than we do, but it is an impediment.

6142. *Sir Thomas Middleton*: In reply to the Chairman you referred to the education of women in Gujarat?—Yes. I said that, considering the state of

women's education in Gujarat 50 years ago, the rate of progress had been disappointing.

6143. Were you thinking of the north or the south of Gujarat?—I am thinking of the whole, but chiefly of Ahmedabad and Kaira. I am talking of the rural areas.

6144. Is it not the case that the education of some of the cultivating classes in Gujarat has advanced rather rapidly in the last 20 or 30 years?—There are many parts of this Presidency where the rate of advance has been much more rapid in the last 20 or 30 years. No doubt there has been an advance in the area to which you refer, but 40 years ago the position there was already very advanced.

6145. When you say other areas have shown greater advance, how do you measure that advance? In numbers attending or literacy?—I have not the facts and figures before me; I am giving my general impression.

6146. *Dr. Hyder*: Your system of secondary and higher education has been entirely unaffected by the recommendations of the Calcutta University Commission; you have not taken up any of their recommendations?—No. We have a separate School Leaving Board, of course.

6147. You have not any intermediate colleges in this Presidency?—No.

6148. *Sir Chunilal Mehta*: Did I understand you to say in reply to the Chairman that the agricultural bias schools will not interfere with literacy because the boys come there after they have obtained their primary literary education?—Yes.

6149. Is not there a very great wastage after boys have received their instruction in the three R's because so many of them do not continue their studies? As a result of not carrying their studies further, do not many of them forget later what they have learned?—Yes.

6150. Can you give us any idea of the extent of such wastage?—No, I am afraid not, because the only way to do so is to compare the number who have passed the 4th standard (the Punjab 5th) with the figures for literacy, and I cannot understand how the latter are arrived at. The figures are roughly these. Of the boys who enter primary schools, only some 10 per cent. become literate. We have no figures to show how many of those who become literate remain so. I asked someone for his opinion on that and he said 10 per cent., but I think that was rather pessimistic. Still, there can be little doubt that half the people in the villages who once knew how to read and write have since lost that faculty. Undoubtedly a very large number relapse into illiteracy.

6151. *The Chairman*: Is it really the case that there is no relapse into illiteracy after a boy leaves an agricultural bias school?—It is very unlikely that there will be any.

6152. Suppose a boy goes to an agricultural bias school, and remains there 2 years. Is there any danger of a relapse on his part?—After all, he will have been in a school for 7 or 8 years at least. It must be remembered that in an agricultural bias school he is going on with his other subjects (reading, writing, etc.) all the time. There are 3 or 4 hours daily given to ordinary subjects, and it is not likely that a boy who does two years, or even one year, in an agricultural bias school will ever become illiterate.

6153. By that time how old would he be?—It is difficult to say. Theoretically he should enter an agricultural bias school at the age of 11 or 12. I said 6 was the school entering age, and that is so for the advanced communities; but the backward communities generally come in later, and a certain number of years are lost, so that, while I have not the exact figures, the age may be 15, 16, or even 17 in some cases.

6154. You think that provided a boy has worked steadily up to the age of 14 he is unlikely to relapse into illiteracy?—Yes.

6155. *Sir Chunilal Mehta*: Your idea would be to keep the boy at school until at least 14 years of age, in order that he may receive the full benefit

of literacy?—If he attends regularly and is taught properly, it is quite possible to make him literate before that. You cannot keep all the children of agriculturists until 14; 11 is the compulsory age.

6156. I am only talking of the average, not of particularly bright boys. Do you consider the agricultural bias school offers the best chance of keeping a boy at school until that age?—The alternative would be the ordinary upper primary school.

6157. Yes, we have that alternative, but we find that the boys do not go on. You said yourself just now that only 10 per cent. retain literacy?—10 per cent. of those who, having passed the vernacular 4th standard, go back to the fields and do not go on.

6158. Let us say 100 boys pass the 4th vernacular. If none of them went on with their studies, 10 of them would retain their literacy; is that what you mean?—I did not say that; I said someone had quoted that figure, but I thought probably about half retained their literacy.

6159. How many of those 100 continue their studies?—I am afraid I cannot give you that figure. I can only give you the numbers in the first five years and the last three; 836,000 in the first five years and 76,000 in the last three.

6160. What I want is your opinion as to whether the agricultural bias school is the school most likely to attract a boy after he has passed his 4th vernacular, or whether the present alternative course we have now is likely to do so?—You have to consider what attracts in each case. In the case of the ordinary upper primary, the attraction is the Vernacular Final examination. We have managed to attract the boys to the agricultural bias classes by having a modified form of the Vernacular Final adapted to the curriculum of the agricultural bias classes.

6161. Which has the greater attraction of the two?—I cannot say. I should think they were both equally attractive, but the object of the agricultural bias course is to provide something more adapted to their needs.

6162. And which, being popular, is more likely to attract the boys?—Yes.

6163. *The Raja of Parlakimedi*: Is the introduction of agricultural bias training in the 5th and 6th forms popular now?—All reports go to show that it is popular. I have had considerable evidence to that effect.

6164. Do the students who are particularly interested in this training go on to other agricultural institutions?—We only started 3 years ago, and then with only 20 schools, so that there are only 20 which have just completed the course for the first time. So far, I have not got any evidence of what is happening, but I shall watch the after-career of the boys who go through these classes. I have, however, already heard of cases of boys who have completed their 3 years' course and who want to go on to a special agricultural school like Loni.

6165. On page 317, you say plots of land are acquired from villagers at a nominal rent or free of rent for school gardens. In those gardens do the students concentrate on the main crops grown in that area?—Certainly. They are not taught anything beyond what is being done all round in their fathers' fields.

6166. If any improvement is effected in the growth or production of a crop, would you demonstrate it to the villagers?—It should be and I hope it is, but I am afraid I cannot say exactly whether it is done or not.

6167. At present have you got books on agriculture translated into the vernacular?—Yes, but not a book specially adapted for the use of schools. Some agricultural readers were brought out, but (I forget exactly why) they were finally condemned as not being suitable. We have a nature study book which has just been brought out and which is an adaptation of an English book on nature study written up by Dr. Burns of the Agricultural College.

6168. *The Raja of Parlakimedi*: Was it entirely done through the department?—We had a very great deal of trouble in getting it translated into suitable language in the vernaculars. We tried to get it done through some of the teachers at one of the vernacular training colleges; I think it was entirely done departmentally but we certainly had difficulty in getting it put into suitable language.

6169. *Sir James MacKenna*: Is it not a fact that the best literature of western countries is written in the common speech of the people, while the literary and spoken languages in India are so diverse that when a boy leaves school the literature in his own language is more or less a closed book unless he has carried his studies to a great length?—It depends on what you mean by literature; if you put an English agricultural child to read high-flown literature, no doubt he cannot do it, or at any rate, he will find difficulty. What you have to do is to provide him with something which he can read. After all, in England we had "Tit Bits," which I think was the first thing of its kind when the lower classes first became educated.

6170. *Professor Gangulee*: Are you in touch with the various educational experiments now being conducted throughout the country? You have just said that you have not paid a visit to the Punjab schools. There are other experiments going on in the country; are you not in touch with them?—As to the Punjab, we sent a man from our department up there specially to report and give us his views; and, after all, one has read McGee and other books on the various experiments that have been made. We have experiments which are being carried on in this Presidency too.

6171. Do you feel the need for co-operation in this matter of education with other Provinces just to see what system they are trying to work out?—Certainly, that is most useful.

6172. Do you seek advice or suggestions from Mr. Richey, the Educational Commissioner with the Government of India?—No, I do not seek it.

6173. Do you have correspondence with him with regard to your schemes?—No.

6174. You do not seek his advice?—No.

6175. Supposing you had developed a scheme, you would not send that scheme to Mr. Richey for his suggestions?—No, it has not been the practice.

6176. You have been working under the Ministry of Education since the Reforms, have you not?—Yes.

6177. Has this popular control of education in any way accelerated the progress of primary education in this Presidency?—Since the Reforms the most momentous event has been the passing of the Primary Education Act; that was consequent upon the Reforms; it was the work of the then Minister.

6178. We may take it that a definite departure from the policy of education hitherto pursued by the Government was marked by the passing of that Act?—You ask, 'Have the Reforms brought about an acceleration of primary education?' As I say, the main achievement has been the passing of that Act. The fundamental principle of that Act was the transfer of control from the Education Department to the Local Boards and Municipalities. We are now absorbed in the actual work of transferring control.

6179. Do you consider that such transfer will be successful? Already a number of the schools have been transferred?—They have only recently been transferred.

6180. What is your view of the working of those schools that have been transferred to the local bodies; do you find any definite change?—There is not sufficient time to pronounce on the actual results. It is true, of course, that the Act provides for the transfer of control in District Local Board areas and in Municipalities; but it is also true that before the Act these Municipalities did control and manage their schools to a far greater extent than in the District Local Board areas, where the Department actually managed the schools formerly.

6181. Municipalities are mostly concerned with the urban areas, are they not?—Entirely.

6182. Agricultural education is under the control of the Department of Agriculture?—You do not include agricultural bias schools in that?

6183. I have that also in mind; the whole scheme of agricultural education?—Agricultural bias schools are not agricultural; they are not technical schools, nor even vocational schools; they give ordinary education with an agricultural bias. They are under the Education Department, who work with the assistance and co-operation and advice of the Agricultural Department.

6184. You have told us your difficulties with regard to adult education; I understand previous efforts in this direction have proved to be futile. Have you studied the root causes of this failure?—I have never been down and studied it *in situ*, but I have read about it, considered it, and talked to people about it a great deal. The general feeling is this; the people say they will not come out at night; they say it is dark and they are afraid to come out. All sorts of reasons are given. There is a general disinclination on the part of the people in the villages to come out in the dark.

6185. Did you have lantern slides or cinemas or anything like that to attract them?—In this Presidency we have a very complete system of visual instruction, with magic lanterns. We have no cinema. I cannot say we have concentrated in one village with a magic lantern. We have lanterns which are used in the High Schools, and our Inspecting staff also take them round with them when they tour, so that these lanterns have never remained in one place.

6186. These efforts towards adult education were confined to the urban areas?—I have been thinking this afternoon entirely of rural areas.

6187. You rightly point out that you cannot get efficient teachers for all classes of schools?—I cannot say we do not get efficient teachers. I do not put it quite like that. We get as good teachers as we can get. Our teachers have what we consider a fairly high qualification, and we have a very large percentage of trained teachers.

6188. From the table you have put in, I see you have about 11,000 untrained teachers?—Yes; but, our percentage of trained teachers is over 60. But you must remember that even the untrained teacher has passed the Vernacular Final examination; that means he has gone through an eight years' course. He will probably be teaching in a village school which goes up to the fourth standard. Compared with other Provinces in India, I believe that is a far higher qualification than the ordinary untrained teachers have.

6189. Do you not think an untrained teacher is likely to give a distaste for education rather than create a taste for it?—I do not see why he should give a distaste. It is quite possible that he may be an efficient teacher. A man who has passed the Vernacular Final examination should be perfectly competent to give distinctly efficient education up to the fourth standard.

6190. Your second difficulty is to arrive at a suitable curriculum for your schools?—No; on the contrary, when you are dealing with the first four years there is not much room for divergence of curriculum, and I said it depends chiefly on the teacher. What I meant was that it depends very largely on the personality of the teacher. If you get the right man he will teach the curriculum, but if you get the wrong man he will not. The teacher is really the most important factor.

6191. In your lower primary grade do you have a satisfactory curriculum from the infant stage to the fourth standard?—It is fairly suitable, I think.

6192. You are aware of the projected method put forward by the Rev. McGee in his schools. Are you doing anything of that kind?—No, not in our ordinary village schools. In certain selected schools here and there, there are people who are trying experiments, but that is one out of ten thousand.

6193. *Mr. Calvert*: Is there now any steady persistent propaganda being carried on in favour of adult education?—Just at the moment in rural areas I think not. I am not quite sure what the Co-operative Department is doing. There have been two or three starts with adult education, but they all seem to have petered out. There was a society started in Bombay about 3 years ago; I was asking about it the other day, but I could not find that anything much had been done. I do not know whether its activities were to be extended to rural areas.

6194. *Mr. Kamat*: With regard to the training of teachers for agricultural schools, you said your principal difficulty was as to buildings in rural surroundings?—Yes.

6195. If the Loni type of school were devoted solely to the training of teachers, would that settle your problem of agricultural education?—Are you suggesting that Loni would be suitable for training our teachers for ordinary rural schools and that instead of training them in Poona we should train them in Loni?

6196. No, my question is this. The Loni type of school is rather expensive; each boy there costs Rs. 275 to Rs. 300 for the educational training he gets. If that school is not indispensable, should not the Loni type of school be converted into a training school for turning out agricultural teachers? Would such an arrangement upset your system of agricultural education?—I cannot understand the question.

6197. I say the present type of school boy you turn out at the Loni school is expensive. In the first place, is it indispensable that you should have a Loni type of school?—The Loni type of school is not indispensable.

6198. If it is not indispensable, cannot you convert the Loni school into a training college for agricultural teachers?—Your suggestion is that Loni should be used for training teachers for agricultural bias schools. But a teacher for an agricultural bias school has two trainings at present; he is first trained in an ordinary normal school and then he gets a special training in agriculture.

6199. What would you do; first of all give him rural and agricultural training throughout?—Yes, certainly.

6200. *Dewan Bahadur Malji*: On page 318, of your note you have given the alternative curriculum?—Yes.

6201. That is not yet entirely put into operation?—In what respect do you mean?

6202. There are certain books which are only in Modi and are not translated into other vernaculars?—I do not know what they are doing in Gujarat but they must be doing something. And, after all, we have got the Vernacular Final examination, so that they must be preparing something special for it.

6203. You have no definite idea?—No, I cannot tell you straight away.

6204. I understand you are now contemplating incorporating in your vernacular series for ordinary schools, lessons in agriculture?—Certainly; we are considering the question of revising our Readers altogether.

6205. I hope you will at least allow the lessons when prepared to be criticised through the Bombay Central Co-operative Institute?—Most certainly; or perhaps written by them.

6206. *The Chairman*: You have given the Commission a statement showing the expenditure on education in Bombay?—Yes.

6207. Have you that before you?—Yes.

6208. Would you tell me whether the Government funds under the first heading "University" are really recurring funds, that is to say, are they truly annual expenditure?—Yes, that is the annual expenditure. That sum is the sum that is every year voted in the budget for "University and higher education." I have put it here as "University," but it represents also the

maintenance of Government Arts and Professional Colleges and grants to Non-Government Arts and Professional Colleges. I should really have said higher education.

6209. How much in fact are the annual grants by Government to Universities?—It comes under different heads, but I think we only actually give a grant of half a lakh in this Province. I can get you the figures. We give far less to the University, practically nothing compared with other Provinces in India.

6210. The Bombay University is entirely independent?—Yes, and, compared with the Universities in other Provinces, it is almost self-supporting.

6211. On page 316 of your memorandum you are talking about the agricultural bias classes, and in paragraph 6 you say, "Each class has one agricultural teacher over and above the staff that would normally be employed." Does that mean that each class has an additional teacher?—That is the paragraph for which I have substituted my amendment.

6212. Then I have got the wrong paper?—I am afraid I made that mistake myself; that is the reason why I submit this revised figure. He is not over and above; he replaces an ordinary teacher in the school. Therefore the only expenditure which you can legitimately debit to the agricultural bias class as such is the difference between his pay as an agricultural bias teacher and what it would be in an ordinary school.

6213. I do not know whether you would wish to say anything about your views as to the desirability of introducing compulsory education?—I look upon compulsion as being one of the most hopeful means of securing literacy during the first 5 years.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Friday, the 29th October, 1926.

Friday, October 29th, 1926.

POONA.

PRESENT:

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

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.	Mr. H. CALVERT, C.I.E., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.	Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.	Professor N. GANGULEE.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.	Dr. L. K. HYDER.
	Mr. B. S. KAMAT.

The Hon'ble Sir CHUNILAL V. MEHTA. } (*Co-opted Members.*)
Dewan Bahadur A. U. MALJI.

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

Mr. R. M. MAXWELL, M.A., C.I.E., I.C.S., Collector of Kaira,
Bombay Presidency.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) The supply of teachers and institutions for agricultural education is so small that it can not really be said that such education is within the reach of all cultivators. Whatever scope there may be for remodelling primary education (which is now the concern of Local Boards and Municipalities), it is certainly surprising that secondary education is to this day so largely devoted to general subjects which may be held to qualify the students mainly for clerical work in Government services, and in my opinion it would be useful to set up an entirely separate branch of secondary education wholly devoted to the needs of agricultural communities.

(v) and (ix) At present I fear that agriculture is studied mainly as a means of getting a comparatively easy degree in order to qualify for better paid posts in Government service. What becomes of the majority of the students I am unable to say; but a good many of them are certainly employed in Government service to do duties which have no connection with agriculture; and certainly a very few of them are actually occupied in cultivating their own lands or those of others.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—I think that demonstration farms and plots have done a certain amount of good but the objection is that they are not carried on on commercial lines. They cannot, therefore, be expected to exercise much influence among people who have to make their livelihood out of agriculture. The object of demonstration should be to convince the cultivators that better crops than their own can be grown under identical conditions and yield a higher rate of profit after the deduction of all expenses. I cannot say that I have ever seen an agricultural farm which was calculated to carry conviction in this manner. I think that instead of having big farms or permanent demonstration plots, it would be better to lease one Survey No. from time to time in a much greater number of different villages, where a profit and loss account should be kept under the supervision of the villagers themselves so that they could see exactly how the expenses and their results compared with their own.

Generally, without claiming much detailed acquaintance with the work of agricultural demonstrators, I should say that agricultural propaganda were rather conspicuous by their absence, although undoubtedly more effective than formerly. My impression is that the ordinary agriculturist can hardly ever meet an agricultural officer. This is not entirely the fault of the Agricultural Department, who are thinly staffed for the area they have to cover; but I think that there is perhaps over-much tendency to expect all direct propaganda work to be carried out by the *mamlatdars*. Anything in the nature of sustained propaganda there certainly is not, if one discounts the distribution of more or less indigestible Agricultural leaflets which probably few cultivators can read. Lantern lectures, constantly followed up by more such lectures, would be sure of getting an audience if delivered in the villages themselves; but it is useless to call the cultivators miles away from their own village for such purposes. To be effective, agricultural propaganda must be carried to their doors, and I think this is where we fail at present.

QUESTION 5.—FINANCE.—(a) Apart from what has been said in dealing with other questions, I would suggest that instead of leaving everything to the initiative and resources of the individual cultivator, Government, as the ultimate owner of the soil, should be prepared to carry out work necessary for the reclamation, protection or improvement of its lands, recovering interest on the capital expended in the form of enhanced assessment. At present except in the field of irrigation where this principle is already recognised there is no expenditure on development of a remunerative kind. I have known many cases where cultivators unable to give security for loans or to combine for the purpose of joint schemes would gladly have accepted such an alternative, with permanent benefit to themselves and the land.

(b) There is no need to "induce" the cultivators to make fuller use of *taccavi*. Usually the demand for loans for seed and cattle (so described but mostly intended for general family maintenance in the later part of the season) would run up to any figures if allowed, and the main problem is to substitute the agency of co-operative societies. The demand for loans for land improvement is also usually more than the supply, and this demand is mainly due to the low rate of interest charged. If however it is desired to encourage this demand for loans still further, something should be done to enable the loans to be granted more promptly and to eliminate formalities.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) The main causes of agricultural indebtedness in my opinion are,

- (1) social customs, *e.g.*, excessive expenditure over marriage and death ceremonies,
- (2) lack of facilities for obtaining the money advances necessary for regular cultural operations (*e.g.*, seed, manure, labour) from agencies which will not take deliberate advantage of the ignorance or simplicity of the cultivator.
Consequently,
- (3) prevalence of landlordism, as a result of which most of the profits of agriculture go into the pockets of persons, largely non-agriculturists, who regard the land mainly as a safe investment for their capital. This demand for land as an investment is again due to
- (4) lack of regular banking facilities and opportunities for safe investment of money apart from lands.

The consequent decline of the peasant proprietor class is greatly assisted by the provisions of section 86, Bombay Land Revenue Code, which are wholly favourable to the landlords.

(b) and (c) I would recommend firstly the repeal of section 86, Land Revenue Code, and the connected sections, and secondly the withdrawal from Civil Courts of all jurisdiction in money suits against small farmers unless brought by a co-operative society. The result of these measures would

be to drive people to co-operative societies for their finance and to compel investors to invest their money in such societies, which have their security in land, rather than to invest it in land on their own account.)

If the measures here recommended were taken, there would be no need to restrict or control the right of mortgage or sale; but I certainly think that non-terminable mortgages should in any case be made impossible; care would however be necessary to prevent evasion of such restrictions by formal renewals of the transactions.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) and (b) While admitting the great desirability of reducing fragmentation and consolidating holdings I doubt whether the State can legitimately claim to control the disposal of private property by any direct method. The only proposals for the consolidation of holdings which I have seen are contained in the Bill now under the consideration of Government; and so far as I can see this Bill would infallibly remain a dead letter, even if passed, because the required proportion of consenting landlords would never be obtained.

As to the provisions of the same Bill for the prevention of fragmentation the great danger is that any such measures would give scope for under-hand dealings in which the cleverer or richer party would as usual get the better of the simpler or poorer. The only safe method of dealing with the fragmentation in my opinion is to leave it to the common sense of the people and to give an indirect stimulus to consolidation by placing all possible minor disabilities on the owner or creator of the fragmented holding, e.g., disabilities connected with the payment of assessment. At present the measurement and recognition of sub-divisions of Survey Nos., however small, affords not the slightest check in this direction. I also think that schemes of consolidation would be a legitimate object of *taccavi* provided that small holders were protected from absorption by their larger neighbours.

QUESTION 8.—IRRIGATION.—(a) The Kaira district is well adapted for (1) a big scheme of canal-irrigation, such as the Mahi river scheme now under investigation, and (2) expansion of well-irrigation, especially with power pumps. Much progress has been made in this district already in the latter direction, but there is still a large demand for *taccavi* for fresh pumping installations.

QUESTION 10.—FERTILISERS.—(a) In the district of North Kanara there is a great field for the introduction of artificial manure in the cultivation of rice land. At present the manure chiefly used consists either of "Soppu" (green leaf manure) or "Darku" (dry leaf manure). The collection of these materials is very laborious and wasteful of time and involves the destruction of forest upon which the people depend. Experiments are now being made at the Kumta Agricultural Farm to find artificial substitutes.

QUESTION 11.—CROPS.—(a) (iv) Damages by wild animals fall under two heads:—

(1) Pig and other jungle animals in tracts near forests.

Here the whole case turns on the problem of fencing, the importance of which is only just beginning to be realised by the cultivators. Wire fencing with suitable iron uprights should be made available in very much larger quantities and if possible at much cheaper rates than at present. People are ready to take *taccavi* for purposes of wire fencing but in my experience it usually had to be ordered from England and the delay was great while the expense could not be determined beforehand. Walls have also been used successfully for pig protection purposes in tracts where stone is plentiful. If constructed in the right manner and maintained in good order by means of co-operative societies, these afford adequate protection even from pig and result in an immediate increase in the value of the lands enclosed.

(2) Monkeys, *nīlgai* and black buck in the open tracts, specially in Gujarat.

The damages caused by monkeys alone and the expense of employing watchmen to scare them out of the crops must amount to an immense loss every year to the cultivators of this tract, but it is useless to provide them with means of destroying these pests since they regard their life as sacred,

and thus they must apparently continue to suffer under a self-imposed disability.

QUESTION 14.—**IMPLEMENTS.**—(b) All I have to say under the head of improved implements is that before they become a practical proposition there must be numerous workshops in every district capable of repairing them and supplying spare parts. It is useless to push propaganda for the adoption of improved implements until this is done.

QUESTION 16.—**ANNUAL HUSBANDRY.**—(b), (c), (d) and (e) in the Kaira district the principle of growing fodder crops and stacking fodder as a reserve against famine in future years is well understood. All valuable cattle are stall-fed and in normal years there is sufficiency of grazing, although I think too much grazing land has been given out for cotton cultivation. The shortage of fodder usually occurs only in May and June. It is to some extent relieved by growing fodder *juari* (*sundhia*) by means of well-irrigation. This is one reason for encouraging the extension of well-irrigation in this district as recommended under question 8 (a).

QUESTION 18.—**AGRICULTURAL LABOUR.**—(a) (ii) The only area of the kind described with which I am acquainted lies in the Mundgod Peth on the eastern side of the North Kanara district, where large tracts of good rice land were lying uncultivated in 1923-24. It was found in this case that there was a strong tendency towards colonisation from the adjoining parts of the Dharwar district. Government assisted in this process by giving out the land on easy terms to capitalist farmers who themselves undertook the expense of bringing the land under cultivation, brought tenants from outside and built houses for them. Many more smaller farmers would have taken up these lands but for want of capital, and the experience gained seems to suggest that if Government had been prepared to spend money in putting the land in order and in providing houses, a very much larger area would soon have come under cultivation.

In other cases in North Kanara, especially the spice garden tract, the problem of importing labour sufficient to keep land from falling out of cultivation appeared to be almost hopeless, as only persons born and bred in that tract would consent to live in it. (Here a better provision of medical facilities might have done much, coupled perhaps with a more generous forest policy.)

(c) The only place I am aware of where real and chronic shortage of agricultural labour exists is in the tract mentioned above. Everywhere else there is naturally a seasonal scarcity of labour owing to the limited time within which active agricultural operations have to be completed; but complaints of scarcity at other times are due mainly to the unwillingness, inefficiency and irregularity of the workers. This feature again is due to the high rates of wages established during the war, which have not led to an increase in the efficiency of labour but have merely provided the means of increased absenteeism.

QUESTION 19.—**FOREST.**—(a) Forest proper is itself a semi-agricultural crop grown by the State and should not be regarded as an accessory to other cultivation which, even if successful, is less valuable to the resources of the country. At the same time where valuable cultivation occurs in areas where forest proper predominates, considerably greater latitude could be allowed to cultivators in obtaining their agricultural requirements from forest. (In my experience in North Kanara, even in tracts where forest was not capable of exploitation many of the restrictions imposed on the use of forest produce were quite needless. In valuable forest areas, however, where cultivation is very scattered and is of no value, I think it would be better to acquire it for inclusion in forest and to move the cultivators elsewhere, so that no conflict of interests need arise.)

In minor forest tracts, where large areas of cultivation exist, the cultivators have to be prevented from destroying the forests on which they depend to a very large extent. By the creation of the Minor Forest Division in North Kanara, the principle has been recognised that these forests

ought to be managed for the benefit of the agriculturists, and this recognition, I believe, is resulting in a constructive and not merely protective policy which in course of time should develop much further. Up to date however I think that too many petty restrictions are still in force in minor forest areas and there is too much effort to make these forests a source of forest revenue.

(b) and (c) The supply of firewood in rural areas may be increased by abating the assessment during the period of growth on Survey Nos. planted up for fuel purposes, e.g., planted with casuarinas. The assessment in such cases could be recovered at some suitable rate when the crop was capable of yielding a return. Something might also be done by systematically planting waste areas in charge of the Revenue Department. These areas are now left entirely to look after themselves.

(c), (d) and (f) Undoubtedly in many places the deterioration of forests, due to excessive grazing and other circumstances, is not only leading to soil erosion but is exposing the tracts concerned to disastrous floods in heavy rains, while depriving them of moisture in the dry season. The valley of the Shiravati river in North Kanara is an instance in point. I think the process tends to be assisted by the practice lately adopted by the Forest Department of burning down heavy evergreen forest and in its place planting teak and other deciduous varieties in order to increase forest revenue. The only remedies which I can suggest are:—

- (1) To make the minor forests capable of supplying the grazing and all other agricultural needs of the villages depending on them. There are, for instance, large areas of minor forest in North Kanara which owing to the denudation of soil now produce nothing. Careful experiments are necessary in such areas to ascertain the best methods of encouraging the growth of grass and trees useful for fodder or for agricultural implements.
- (2) To keep sporadic cultivation out of the big forests as suggested under (a) above.
- (3) To pay more attention to reclothing the hill-tops with forest even in areas where immediate exploitation is unlikely; and to be very firm in refusing to disforest hill-tops and hill-sides for cultivation.

QUESTION 22.—CO-OPERATION.—(a) Please see answer to question 6 (a) and (b).

In my opinion the co-operative movement will remain at some disadvantage unless it can manage to reduce the rate of interest on the loans given for co-operative schemes of development where the capital involved is large. This disadvantage is illustrated in the answer next below.

(b) (iv) The North Kanara district offers almost unlimited scope for societies for the construction—or very often only the maintenance—of protective works, particularly common *bunds* and fences or walls. Scarcely any progress, however, has hitherto been made in the formation of such societies. In two important fencing schemes with which I had to deal, the people preferred to take *taccavi* direct from Government on a joint bond owing to the comparatively high rate of interest charged by the Co-operative Bank. In other cases, especially those of protective *bunds*, the failure has been largely due to the indifference of absentee landlords, and to mutual distrust and general absence of the co-operative spirit. It is with this experience in view that I have suggested in the answer to question 5 (a) that Government itself should be ready to take the initiative in such schemes.

(c) Legislation on the lines indicated has actually been proposed in this Presidency, but the suggested measures, depending on the consent of a large majority of the landowners and involving an elaborate procedure with definite possibilities of delay, appear too weak to achieve anything. If any such legislation is undertaken I think the initiative, at least in protective schemes, should be made to depend on the Collector's certificate of the necessity of the scheme. Non-protective schemes of improvement might still be

ft to co-operative effort assisted by provision for acquiring the lands of any recalcitrant minority.

QUESTION 24.—ATTRACTING CAPITAL.—In the colonisation projects mentioned in the answer to question 18 (a) (ii), and again in the recent extensive reclamation of “mal” lands in the Kaira district, the offer of specially favourable terms by Government proved sufficient to induce capital to come forward. Apart from such large speculative projects, the amount of expenditure which owners are prepared to put into the ordinary cultivation of their lands seems to depend partly on the competition for land in the locality and partly on the responsiveness of the soils, *e.g.*, the Charotar tract of Gujarat, there is much competition for land, values are consequently high, holdings are proportionately small and cultivation, on a soil well adapted to it, tends to be intensive. In the absence of such strong inducements, however, the great uncertainties of the rainfall of most parts of this Presidency must necessarily dispose people to risk as little as possible in one year's harvest; and to some extent the liability of the assessment to periodical revisions must operate as a deterrent to capital.

QUESTION 25.—WELFARE OF RURAL POPULATION.—Most village sites are much too crowded, but such a habit has been adopted largely for reasons of security and it is probably due to this tradition that compact holdings are so rare, since there was little inducement to acquire lands in a compact block when the farmer did not intend to live there. Now the results, in the shape of scattered holdings, militate against any general movement to set up farm houses on the land, and it is difficult to relieve overcrowding in any other way.

(2) I would suggest that far more numerous dispensaries for the treatment of outdoor patients are a prominent necessity for the improvement of general well-being in rural tracts.

Oral Evidence.

6214. *The Chairman:* Mr. Maxwell, you are Collector of Kaira?—Yes.

6215. You have put in a written note of the evidence which you propose to give. Do you wish to make any general statement supplementing that in any way?—I do not think I have any general statement to make.

6216. Then we may proceed at once to question and answer. I think you have dealt very clearly with the questions you have answered, and I therefore propose to ask you only a very few questions. The Commission is greatly obliged to you for the trouble you have taken to collect the material and present it in the form in which you have. On page 336, in answer to question 2, you are talking about agricultural education and you say that a good many of those who pass through the system are subsequently employed in Government service. Do you deplore that?—Yes. If you are going to go to the expense of providing specialised agricultural education, it is a waste of that expenditure and the special training given if these people afterwards follow occupations which have no real connection with agriculture.

6217. Do a certain proportion go, for instance, into the Revenue Department?—A certain number do.

6218. Do you think it is no advantage to a Revenue officer to have a certain knowledge of, and sympathetic attitude towards, agriculture?—I have not really observed that it makes very much difference in their work as Revenue officers.

6219. Now, as to the various methods of demonstration and propaganda which you deal with, I think the weight of the evidence before the Commission is that the most promising field for demonstration is the cultivator's own plot. Is that in line with your own experience?—Yes. Generally speaking that is what I should consider the best form of demonstration.

6220. In other circumstances there is always the fear in the cultivator's mind that the whole resources of Government are at the disposal of the demonstrator, and that he, the cultivator, could not achieve the same result on his own fields with his own financial means?—Exactly, I am sure that would be the feeling.

6221. I was really surprised to notice that on page 337, where you deal with the main causes of agricultural indebtedness, you have not put down the uncertainty of the season and the occasional failure of the monsoon as one of the principal causes of that indebtedness. Probably you thought we would take that for granted. You probably do agree that the failure of the monsoon is one of the principal reasons?—I should not regard that as one of the principal reasons. I think the tendency of the agriculturist in this country is not to put too much money into any one year's crop, and therefore if that crop is a failure the agriculturist is not really very hard hit. I do not think it makes very much difference to his general financial position.

6222. You do not think that the uncertainty of the season has a bearing upon the rate of interest claimed not merely by the moneylender but also by the co-operative associations from the agriculturists?—I do not think so. So far as my experience has gone the frequency of really bad seasons in which the cultivator would be left completely insolvent is not very great. The average amount of suspensions outstanding in any district so far as land revenue is concerned, which is an index of financial insolvency, is not very large compared with the total amount of the revenue collected.

6223. Do you think if, over a period of twenty years, there were no failure of the monsoon that would make no contribution towards the liquidation of an important part of the debt of the cultivators?—I do not really think that it would make a great deal of difference. I think it would make the landlords and moneylenders flourish more greatly, but the average cultivator would not score very much.

6224. The extent of his credit is the measure of his debt?—Yes, that is about it.

6225. Just below that, on page 337, you say, "The consequent decline of the peasant proprietor class is greatly assisted by the provisions of section 86, Bombay Land Revenue Code." Do you suggest there is a progressive decline?—That is my general impression, but I cannot quote figures to prove it.

6226. You mean a progressive economic decline?—The tendency is for the land to pass into the hands of the landlord class rather than the peasant proprietor class.

6227. Do you think statistics indicate that there is a reduction in the totality of land in the hands of small proprietor cultivators?—I think if you could go back far enough and get accurate statistics they would.

6228. With reference to what you say about the Land Revenue Code, the Commission is quite prepared to hear your views as to the Land Revenue Code having a bearing on agricultural prosperity or the reverse, and I have not removed what you say on that from your note, but in the view of the Commission any suggestions for the repeal or amendment of any part of the Land Revenue Code would be beyond our terms of reference. If you wish to say anything as to the extent to which these sections of the Code bear upon the cultivator's prosperity you may develop the idea. Do you wish to add anything to what you have said?—One of the suggestions which I made in answer to another question has a slight bearing on it, namely, that at the present moment in the Land Revenue Code there is no provision by which Government can itself undertake the improvement or development or protection of agricultural land and then recover the expenses or interest on the capital expended by Government in that way in the form of an additional cess on the land. There is no provision in the Land Revenue Code which enables Government to do that, and consequently it is not done.

6229. Have you the wording of the section of the Code to which you refer?—I have not got it here.

6230. Perhaps you will tell the Commission what its effect is?—Section 86 is the section which enables the landlord to recover rent from his tenants (that is, the ordinary rent which they have agreed to pay him on their lease) through the revenue courts as an arrear of land revenue.

6231. *Mr. Calvert*.—Through execution?—No. He applies to the revenue courts in what is called a rent or assistance suit. That suit is adjudicated and a decree passed against the tenant, if he is adjudged to be liable, and then after that the execution is also carried out by the Revenue Department in exactly the same way as land revenue arrears are recovered.

6232. *Devan Bahadur Malji*: That is limited to the current year?—Yes. He can only sue for one year's rent, but the rent is not limited to the current assessment.

6233. *The Chairman*: On page 338 you deal with the provision of fencing to protect crops from damage by wild animals and you say, "Wire fencing with suitable iron uprights should be made available in very much larger quantities and if possible at much cheaper rates than at present." How do you suggest that could be done?—I think if Government were to make arrangements to import this material and have it ready in the country at special contract rates it could probably be got more cheaply than by ordering it through ordinary commercial firms.

6234. Government might buy in bulk?—Yes, and they need not make a profit out of it.

6235. You are not suggesting that the general taxpayer should come to the assistance of the cultivator?—No, certainly not.

6236. Some people do make suggestions of that sort, do they not?—I should never suggest that.

6237. On page 339 under 'Animal Husbandry,' I was very interested to see that you say, "In the Kaira district the principle of growing fodder

crops and stacking fodder as a reserve against famine in future years is well understood." What do you think are the reasons which make that practice peculiar to certain districts?—The Kaira district is the only district in my experience which does that to any considerable extent, and the peculiarity of the Kaira district is that there is very little waste land; nearly all the land is available for cultivation and is actually cultivated; and consequently there is very little outside fodder reserve. Also they have a very good breed of cattle and traditionally they go in for milch cattle a good deal and make a certain amount out of dairying.

6238. But do you not find there a large number of more or less worn-out animals eating up the grazing?—Surprisingly few.

6239. What happens to them?—I suppose they die out. As a matter of fact the ordinary cultivator in Kaira does not keep a large number of waste, useless cattle. The general stock of cattle remains chiefly in the hands of professional graziers like *Banjaris*, who take them away and graze them in areas where grazing is available. The cultivators buy from them very largely. The ordinary cultivator only keeps the milch or ploughing cattle he needs.

6240. *Sir Henry Lawrence*: He buys from these *Banjaris* and sells them to them?—I do not know how they dispose of the worn-out cattle. I think they eventually die out.

6241. *The Chairman*: You do not think they buy these cattle at the beginning of the working season and sell out at the end?—I do not think there is an annual buying and selling; a man buys them and keeps them as his own cattle.

6242. Have you had much experience of the carrying out of minor irrigation schemes by co-operative effort?—I have had experience rather in the other way, that where it is obviously desirable that these things should be done by co-operative effort, co-operative effort has failed to achieve them. I do know of one important scheme in Kanara where a co-operative 'bund' society was started and that has been working satisfactorily. In other cases I know of where an effort was made to get them to co-operate for such purposes it proved impossible to get them to combine.

6243. Was it due to want of propoganda over a sufficient period of time, do you think?—In one case I brought all the pressure I could on the landholders to get them to combine and start a society. It was quite a simple thing and required no large amount of capital. Their lands were being destroyed gradually by the overflow of flood water on to the land.

6244. Why did you fail?—Largely on account of absentee landlords. They lived far away from their lands and they did not care what happened to their tenants so long as they got their rent.

6245. Where was that?—On the banks of the Shiravati in Kanara.

6246. On page 341, you say: "Most village sites are much too crowded but such a habit has been adopted largely for reasons of security and it is probably due to this tradition that compact holdings are so rare." Do you mean to suggest that the tradition of the crowded village sites has some bearing on the sub-division or fragmentation of the land?—It may have contributed to it, because it removed a prior objection. If you have a farmer living on his lands, naturally his tendency is to keep his lands together. But if he lives in a village site far away from his lands he does not care very much in how many small pieces he holds them.

6247. I do not quite follow the logic of that. If a man had to walk one or two miles to a piece of his land, I should have thought he would have all the more reason to wish to have his lands compact, so as to avoid wasting further time?—But if he lives in a central village site he has to walk one or two miles whether his land is in the place or not. He cannot possibly have his land near his actual residence.

6248. *The Raja of Parlakimedi*: You say in your statement that the number of agricultural demonstrators is rather small?—Yes.

6249. To meet that difficulty do you not think the Collector can persuade the District Board to start some training schools to train villagers as Demonstrators, not on a very scientific basis, but to demonstrate simple methods of manuring, sowing of seed and so on?—I do not think half-trained Demonstrators would be of great use. If you are going to have a Demonstrator he must be an expert and not a person who has been given a short training at the expense of the Local Board.

6250. They can confine themselves to certain important crops of the district?—I think myself that the ordinary Demonstrator has not very much to show to the ryot with regard to the important crops of his district. The ryot knows very well how to grow his own crops. The aim of demonstration is to show him any crops he can more profitably cultivate but which he does not know about.

6251. In addition to the lantern slide exhibitions, do you think district agricultural shows will be effective in showing to the villagers the possibilities of their village and how they can improve their agriculture?—I doubt whether district agricultural shows would achieve very much unless you had some definite propaganda which you wanted to push. If, of course, you want them to introduce an improved strain of seed of some kind or other, it might be of some use. But you do not need to have an agricultural show for that. If the ryot sees that there is a strain of seed which he can cultivate with advantage and which is better than what he has been using he is ready to take it if he can get the seed, as has actually happened in some districts. There is, for instance, Kaira, where improved tobacco seed has been introduced to some extent.

6252. They might do something to improve the breed of cattle?—From my experience of the Kaira district I know they have very good cattle already. I do not think they are suffering from want of good cattle there.

6253. Are proper steps taken to protect grazing grounds?—No. In general, nothing is done about grazing grounds. They are just left to look after themselves.

6254. Are there forest areas or communal lands for grazing?—In my present district (Kaira) there are no forest areas. In the district where I last had charge, grazing was entirely in forests. It varies from district to district according to the presence or absence of forests, but even where there are forests nothing is done to make them more fit for grazing.

6255. *Professor Gangulce:* As regards agricultural education, you refer to a separate branch of secondary education. Do you suggest special agricultural schools?—Yes. I should like to see the ordinary education that is now imparted confined to a much smaller number of schools which could be used by those people who wish to have a general education with a view to getting service under Government or with ordinary commercial firms. For agriculturists, however, I should like education to begin and end with agricultural education, and not to lead further or by any avenue to Government or commercial employment.

6256. You would not give them a general education but only an agricultural one?—I would not give them a general education.

6257. As regards the standard of the agricultural degree at Poona College you say on page 336, "At present I fear that agriculture is studied mainly as a means of getting a comparatively easy degree." Do you refer to the degrees of B.Ag. and L.Ag. of the Agricultural College here?—Yes.

6258. Is the standard low at present, in your opinion?—I think it is probably easier to get a B.Ag. than to get an ordinary B.A. I am not an expert on the point, but that is my impression.

6259. On page 337 you say that agricultural propaganda is largely conspicuous by its absence in your district. Did you bring this matter to the notice of the Director of Agriculture?—No. The facts are within his knowledge. He knows to how many people he has got to demonstrate.

6260. As you are in charge of the district, and you say that in your district it is conspicuous by its absence, I wanted to know whether you ever brought this matter before the Department of Agriculture, which is another Government Department?—I have not written to the Director of Agriculture about it. I have as a matter of fact spoken to the Deputy Director on one or two small points which came to my knowledge, but obviously the general question of the agricultural staff is a bigger thing; it is no good my pressing that the staff in the Kaira district should be doubled or quadrupled, when it is not being done in other districts.

6261. When the Deputy Directors travel in your district, do they come and see you sometimes?—Yes.

6262. And bring their difficulties to your notice?—Yes.

6263. *Mr. Calvert*: Do you think that the system of child labour prevents the parents from sending their children to school?—Undoubtedly.

6264. Do you or your Deputy Collectors regularly visit the Poona College, say once a year or so?—No.

6265. Is there any system in Bombay whereby you are given permission to visit the Poona College?—I could visit the Poona College at any time I was in Poona.

6266. But not go there specially from your district?—No.

6267. There are no standing orders about going there once a year?—No.

6268. Do you think that the Agricultural Department has got down to the small cultivator, the man who cultivates 5 acres or less?—No.

6269. You say that agricultural propaganda should be carried to their doors. Have you any experience of propaganda through co-operative societies, such as "better-farming" societies?—I have had no experience of "better-farming" societies. I have some experience of Taluka Development Associations, which are co-operative in their lines. I know of one society of the kind which has done useful work, and will probably go on to do better work; it was fairly recently established when I knew it, but I think it was working on the right lines.

6270. There are no specific societies in your district for better farming?—No. Nothing of the kind, so far as I know.

6271. If as the Collector of the district you were to push a campaign for using improved seed, would you be able to get seed in sufficient quantity? Have you any experience of that kind of campaign?—I have no experience of that kind of campaign. Of course, the supply of seed would depend on the supply raised in the seed farms which supply that particular sort. I believe a large amount of cotton seed is now raised in seed farms in Gujarat, but not in my district. In my district tobacco is now being raised and gradually distributed but the amount available for distribution at present would not be enough to stock the whole district, by any means.

6272. But have you ever found that your efforts to popularise seed have been defeated through the inability of the department to provide the seed?—No. I have no experience of that.

6273. On the question of finance, you discuss reclamation, protection or improvement of land. Do you think that there are in your district schemes, both practical and economic, of land improvement?—In my present district, very little, because the value of land is such that capitalists have taken up the matter already. I was thinking, when I wrote that, of the North Kanara district and other less advanced districts where plenty of schemes of improvement might have been carried out with great benefit to the cultivators.

6274. Later on, you say that the demand for loans for land improvement is also usually more than the supply. Am I correct in gathering that the question of land improvement has been held up owing to insufficient allotments under the Land Improvement Act?—I think that a certain number of applications have to be kept over until the next year when the grant for such

purposes is exhausted. I am holding over 5 or 6 applications at this moment for things like pumping plants and so on.

6275. As Collector, you cannot get all the *taccavi* you require?—I have yet to see, because I have written for more money, as a matter of fact, for current requirements, but it has not actually been provided. I have not got the money at present.

6276. Then you say that something should be done to enable the loans to be granted more promptly and to eliminate formalities. I think that is a very general complaint. Can you make any suggestions as to how to eliminate these formalities?—I think a little more might be left to the discretion of the Collector. I have had recent experience of two applications for *taccavi* loans for pumping plant, or something of that kind, in which I was quite satisfied myself that the man understood what he wanted to do, and that the thing was capable of paying, and that he understood the kind of machinery that was needed; the security was all right, but one of these cases has been held up for a considerable time, because, under some resolution passed a great many years ago, it has to be inspected by the Agricultural Engineer, and consequently nothing further can be done until he is able to arrange to visit the place.

6277. Under the Land Improvement Act, what is the limit of the sum you can advance? Is it Rs. 10,000?—I think it is Rs. 5,000, but I cannot remember exactly; it is less than Rs. 10,000.

6278. On this question of indebtedness, is the Usurious Loans Act made use of in your district?—Not as far as I know.

6279. Can you explain that?—If it were made use of, it would be under the civil courts. I do not know what kind of decrees they pass. When the decree is passed it comes to me for execution, if the debtor is an agriculturist.

6280. You, as Collector, have not made any special efforts to make the Usurious Loans Act known throughout the district?—No.

6281. Do the Co-operative Department make it known?—I am afraid I do not know what the Co-operative Department are doing in that respect.

6282. In your district, have the people the power to mortgage their land?—Yes.

6283. What, would you say, is the proportion of secured to unsecured debt? About fifty-fifty?—I think it would be impossible to find out exactly. One never knows the amount of unsecured debt.

6284. Fifty-fifty is the general thing, but you have no data?—I have no data on the subject. I am afraid I could not give you any useful information.

6285. Do you think that a non-terminable mortgage is good for land development?—Good as a means of enabling the cultivator to do something, do you mean?

6286. As a matter of actual historical fact, is the non-terminable mortgage used to secure funds for land improvement?—No, except, of course, the land is mortgaged for *taccavi*, when taken from Government.

6287. With regard to fragmentation of holdings, you think the required proportion of consenting landlords would never be obtained?—Yes.

6288. Even if they knew the value of their rent might go up by 25 per cent. would they not agree?—I do not think so.

6289. With regard to the high price of wire-fencing I see you think it important that that should be reduced. Do you think the price is affected by the protective duty of 15 per cent.?—I think it is bound to be.

6290. The protective tariff is a difficulty in keeping pigs out of the field?—Certainly.

6291. With regard to animal husbandry, you say in the Kaira district the principle of stacking fodder as a reserve against famine in future years is well understood. Could you suggest any means whereby that could be popularised in other districts? The extraordinary fact is that it is known in

some districts and not in others?—I cannot suggest any means of giving an inducement for it.

6292. I think that people are capable of being taught to do it. If they can learn to do it by hard experience in one district they ought to be able to learn in another. We are often told that fodder stacking and stall-feeding should be encouraged, but we are never told how?—You will never succeed in encouraging it, unless the cattle are worth it. In the Kaira district the cattle are worth it.

6293. They are high-grade cattle?—Yes.

6294. Let us assume for a moment you are pushing on this cattle-breeding. Would you have any difficulty in getting a sufficient supply of good pedigree bulls?—I do not think so; not in my district.

6295. You have a good stock?—Yes.

6296. With regard to forests, you suggest the encouragement of the growth of grass and trees on ravine land. Under what department would you place the reclamation of ravine land, Forest, Revenue, or Agriculture?—Forest, I think. Perhaps, Forest and Revenue combined. Forest officers might be attached to the Revenue Department for looking after these areas. It would rather depend on their situation, whether they were in forest or between forest and cultivation.

6297. The Forest Department are supposed to show a profit on their year's turn-over?—Yes.

6298. They cannot take up propositions which are not economic?—No. Forests are semi-commercial.

6299. Would that be an argument in favour of the Revenue Department taking it over?—Not necessarily. If the Forest Department were given to understand that they were not expected to make a profit on every square mile of forest they had, they could do it very well. They have the technical knowledge necessary for this purpose. The Revenue Department could not do anything without their assistance.

6300. *Mr. Kamat:* You make a recommendation, in the interest of the cultivator, I presume, that section 86 of the Land Revenue Code should be repealed. I believe, under this section, assistance is given by the courts to recover debts from cultivators. Is not that the case?—To recover rent from the cultivator, not ordinary debts.

6301. The effect of its repeal would be that probably you would make it more difficult for the cultivators to borrow. Would not that be the indirect effect of it?—No, I do not think so. The difficulty would fall on the landlord rather than on the cultivator, if you regard the cultivator and the landlord as two separate persons. (Section 86 is in favour of the landlord and against the cultivator.)

6302. Quite so, but if that assistance which the landlord gets through the Courts, were taken away, the result would be to make things more difficult for the cultivator. He now feels some confidence in the Courts, but as soon as that confidence on the part of the landlord is gone, he will not lend in the same manner as he is doing now?—I am talking about leasing and not lending; and the landlord has got to lease his lands, otherwise they are of no use to him.

6303. The effect of this would be that all investors would deposit their money in co-operative societies?—There would be an inducement to do so. I do not say they all would.

6304. Is that not the logical conclusion, that on the repeal of this section investors wishing to invest their money would go to the co-operative societies rather than put it in some other investment?—Not necessarily. Those who wished to lend on the security of land could take the risk and do it direct or invest in co-operative societies.

6305. What happens under your scheme in areas where there are no co-operative societies?—I am not aware of any such areas. Besides, co-

operative societies will naturally grow in proportion to the demand for their assistance.

6306. In some districts they have spread very well, in others they have not?—The movement has spread well in both the districts I have last been acquainted with. The only reason why they are not spreading further is the absence of a demand for more societies.

6307. In districts where the movement has not spread so far, how would your scheme work?—It would have to spread; the co-operator would then have an advantage behind him.

6308. *Dewan Bahadur Malji*: Your district is mostly Narvadari?—Not mostly.

6309. Which talukas are Narvadari?—Anand, Borsad and Nadiad are the three principal talukas.

6310. Where the Narvadari tenure obtains, does it affect the credit-worthiness of the agriculturists, as they cannot alienate unrecognised portions?—That does not affect them much. They do alienate.

6311. Do you permit them to do so?—We let them go to the civil court if they want to upset it.

6312. Ordinarily, you do not interfere?—No.

6313. May I take it that practically in your part of the country, the Narvadari law is a dead letter for such purposes?—It is not a very live letter; but I would not say it was a dead letter.

6314. Such alienations are hardly interfered with?—They are not interfered with much by the revenue authorities. What they do in the courts I do not know.

6315. Have you come to know that this tenure is more or less making the agriculturists dishonest to a certain extent?—No, I do not know anything about that.

6316. Do you know that in the neighbouring Gaekwar villages, Petlad for instance, there did obtain such a tenure before?—I am afraid I do not know much about the Gaekwar territory.

6317. Have you come to know that the Narvadari tenure is mostly done away with in that part of the country, by the efforts of His Highness's Government?—I have not heard of that.

6318. As regards indebtedness, which taluka of your district is in more indebted circumstances than others?—I could not say. I have not seen figures; I do not think figures are available.

6319. Is it a fact that Matar, and in particular the Daskoshi portion of it, is the most deteriorated taluka of your district?—Lately, certain parts of the Daskoshi tract have been dropping behind. This year it is all right.

6320. On account of the incessant rains?—Yes.

6321. With regard to your revenue rule of three successive failures only entitling a man to remission, do you think that is very hard on Matar?—That is not the revenue rule. The rule is that you cannot have more than one year's revenue outstanding for collection, and any amount that falls into arrears beyond that is remitted automatically.

6322. It is not necessary that the outstanding debt should be three years?—No. That has been changed.

6323. The *taccavi* debts in Matar taluka are very old, some extending to 10 years?—We have recovered nearly all those.

6324. They are recovered at the expense of the societies' loans; the *taccavi* loans take priority according to law. In the Daskoshi villages, if there is a good year in which these old arrears can be recovered, these *taccavi* loans are given precedence according to law, and the co-operative societies have remained in arrears considerably. They cannot make headway?—I have only had one or two cases in Matar in which the co-operative societies have asked the Collector to recover.

6325. On liquidation?—Against individuals, yes.
6326. In the case of execution proceedings against agriculturists which are transferred to a Collector, to your knowledge is every effort made to recover these debts by farming out the holdings attached, the Collector providing the money and management?—No.
6327. Generally, you sell off the property?—Yes.
6328. That is more or less to the detriment of the agriculturist?—Yes.
6329. Do you know that pounce fees are being charged to agriculturist debtors when sales are held through the Collector by the civil court?—Yes.
6330. In this the agriculturist's debts, instead of being reduced, are added to, for there are no Collector's fees to be charged in case of sales through courts, but here they have to pay double fees, pounceage as well as your sale fees, under the Land Revenue Code?—I cannot remember how that matter was solved. I am aware of the question having been raised. I do not think they have to pay both fees.
6331. You can take it from me they do. If that is so, it is unfortunate?—Yes.
6332. *Sir Henry Lawrence*: With regard to your proposal to repeal section 86 of the Land Revenue Code, has this matter ever been put forward by you and discussed with other officers or by Government?—I have often had a hit at it when the opportunity arose, but I have not actually put it forward as a separate proposal and asked for it to be considered.
6333. You have never seen the views of other officers on the point officially recorded in any Government Resolution?—No.
6334. What is the object of this section 86?—To secure the revenue only.
6335. It is not to assist the small holder by keeping him out of the civil court? Is it not to provide an easy and quick decision for a question which might occupy a lot of time in a civil court, and cost the parties a great deal of money to obtain a decision? Is that not the purpose of the section?—It would not have struck me that that was the purpose of it.
6336. You do not think that, as a result, it does relieve the debtor of heavy expenditure in civil litigation?—The way the section works is this; every landlord, if he fails to recover the full amount of his rent, takes the tenant to the *mamlatdar's* court for assistance against him. Had he to go to the civil court for that purpose, he would compound the matter, and if he got reasonable payment from the man he would not carry it any further.
6337. That is an intelligible view; and in your view, then, it is the small man who is injured by it?—Yes.
6338. I think it would be interesting to have that discussed by Government. On page 339, you speak of the use of forests. You have had a great deal of experience of forest matters?—Yes.
6339. You have been Forest Settlement Officer for how many years?—I have not been a Forest Settlement Officer. I have been in a forest district as Collector, but I have not actually done forest settlement.
6340. You were there for some years?—Yes.
6341. For how many years?—In Kanara, for 7½ years altogether.
6342. Have your views here regarding the exclusion of the local residents from the benefits of the forests been put forward? Have you made any suggestions or proposals at any time?—I did make certain proposals when I was Collector of Kanara.
6343. Were they accepted?—I was transferred before I knew the result and I have not heard what has happened since. I was able to do a certain amount in the way of easing unnecessary restrictions, but I do not know what eventually happened, because the matter was still under correspondence when I left the district.
6344. How did you get these unnecessary restrictions removed? By what means or agency was it done?—That was in correspondence with the Commissioner on various matters like the privilege rules or the permit rules, when

they were under revision or consideration. Certain proposals were made from time to time to improve the working of those rules.

6345. These improvements were ordered by the Commissioner and the Conservator in consultation?—Yes, I think so.

6346. But there are still, in your view, other matters which require further consideration for the relief of the local inhabitants?—Yes, unless they have been disposed of during the two years since I left the district.

The Chairman: I want to refer to the question relating to the terms of reference which I mentioned a short time ago. The terms of reference say that it will not be within the scope of the Commission's duties to make recommendations regarding the existing system of landownership and tenancy or of the assessment of land revenue. Since my reference a few moments ago to the matter, I have had before me section 86 of the Land Revenue Code, and I wish to modify the ruling which I then gave to the extent that so long as any provision of that Code does not apply directly or indirectly to the assessment of land revenue or to the existing system of landownership or tenancy, there is no reason why such a provision should not be dealt with in evidence before the Commission.

6347. *Sir Ganga Ram:* Is your district subject to famine?—Yes; it is rather liable to famine.

6348. What is that due to? Is it the rainfall? You have a good rainfall, have you not?—Yes; this year there is no famine.

6349. The rainfall is precarious?—It is very precarious.

6350. In your district have you no canal-irrigated areas?—There is a small canal-irrigated area in the north-west corner of the district, in the Matar taluka.

6351. About how much?—About 7 or 8 villages; I could not give you the actual area.

6352. The rest is well-irrigated?—Yes.

6353. How many acres does each well command?—I could not say exactly. They vary tremendously according to the water-supply.

6354. At what depth is the water from the ground level?—50 feet, 80 feet, or even 90 feet.

6355. Do they draw the well-water by bullocks?—Yes.

6356. Not by power machinery?—In more advanced talukas they are using power pumping plants to an increasing degree.

6357. What area is commanded by well-irrigation? How much does an individual well command?—I am afraid I cannot say exactly. I think it varies a great deal. My idea is about 4 to 5 acres.

6358. Can only 4 or 5 acres' produce pay for the lifting of water from wells? If you use power pumping machinery you will irrigate a larger area, if you have the water-supply in the well. There are some wells, where there is a good water-supply and the pump is working for long hours, which irrigate a much larger area.

6359. How much area?—I am afraid I cannot give you the figures. I have not studied them.

6360. Are the wells giving a sufficient supply of water? Is there any deficiency?—They are very uneven. In some of them, if they are sunk on a flow, the water-supply remains constant, but the majority of the wells in that district are sunk on percolation areas.

6361. You could not say what is the discharge of each well?—No. They must vary from well to well.

6362. Do you think that the supply of water from wells can be improved? Is there any necessity to improve it?—There is a necessity for sinking more wells in the right places; that is what they want in the Kaira district.

6363. You do not know whether the zamindars require the supply to be augmented by some means?—They certainly do. Well-irrigation cannot do all that is to be done.

6364. Do the Agricultural Department pay any attention to it?—I think they are always paying attention to it. It is the main topic of interest.

6365. Are they paying attention to increasing the supply from wells?—They cannot do anything to increase the supply. There has been a great complaint in recent years that the supply was diminishing. That matter has been under investigation, but nobody can do anything to increase the supply, except send round the Water Diviner.

6366. I find in your district the average acreage per head is about .92, and if you take away from that the oil-seeds, it comes to .90 only. Is that sufficient for the people to grow their own food? Do they grow their own food, or do they import it?—I do not think they are importing food. I think in a normal year they grow their own food.

6367. They have not got any surplus to export?—No. Their exports take the form of cotton and other non-food crops.

6368. They grow their own food for their consumption and sell the cotton?—Yes.

6369. Or, have they to sell cotton in order to make up the deficiency in food?—I do not think so. The district on the whole, I think, probably grows its own food supply, but I have not got the figures of imports.

6370. I see that you grow a large amount of *ragi* which is very inferior stuff. In those places, can they not grow wheat or any other superior stuff?—Not in the rainy season. *Ragi*, that is *barto*, is grown in the rainy season. You could not grow wheat in that period. It is done in the present season.

6371. What are the crops in the *rabi* season? You grow very little wheat. Do you grow any food crops in the *rabi* season? Have you tried to grow wheat in the *rabi* season?—Wheat is always grown in the *rabi* season.

6372. It is very small in quantity?—It can only be grown where it is irrigated or in suitable soil. It is mostly grown in places like the Daskoshi tract, where you have soil suitable for wheat.

6373. I am not prepared to admit that. We have grown wheat where it had never grown before. On page 336, you talk of demonstration farms. Is it not possible for you to get areas of land on lease and give it to the Agricultural Department to start demonstration farms? Then they could show to the people improved methods, and people would adopt those methods?—That is one of the ways of doing it. The land could be leased, I have no doubt, for demonstration purposes.

6374. They need not buy it?—No.

6375. You say something about cheap fencing. The only wild animal which is troublesome in your district is the pig?—In my district there are no really troublesome wild animals except monkeys. In other districts fencing is needed for protection against the pig, and also against other forest animals, such as *chital* and *sambar*.

6376. What is the minimum height of the fencing that you would supply?—5 feet.

6377. Not less than that? The pig does not require a fencing of that height?—The pig can jump a good height, I think.

6378. What is the cost of fencing now?—I am afraid I could not give you the exact figure. I know of one case in which the people wanted to build a wall $4\frac{1}{2}$ miles in length, and they asked for Rs. 10,000.

6379. *Sir Thomas Middleton*: In reply to *Sir Henry Lawrence*, you indicated that you had had a good deal of experience in the forest districts of North Kanara. You say the principle has been recognised that these forests ought to be managed for the benefit of the agriculturists. For the benefit of those of us who do not know the conditions, would you indicate what the changes were that were accomplished during the period you were in North

Kanara?—The coast of North Kanara is very thickly populated. The tract which is principally cultivated is along the coast. It is this coastal strip that makes the largest demand on the forest for dry and green leaves for manure, for cattle grazing for fencing and for wood for agricultural implements. They depend upon forests for carrying on cultivation along the coast. During the time I knew Kanara the whole coastal strip was made into a minor forest division and put under a separate forest officer, who worked in close liaison with the Revenue Department to conserve the resources of this tract of minor forest and, as far as possible, to enable the cultivators to get what they wanted without a great many restrictions and difficulties.

6380. Was any attempt made to regulate grazing with the object of getting better grass?—No, there was no way of regulating grazing unless you were prepared to fence, and though some private individuals did so it was not done officially on account of expense.

6381. In that particular area is the grass really abundant?—Not nearly abundant enough because the soil is very rocky and has been largely denuded by cutting down the forest.

6382. From your reply to Mr. Calvert I inferred there were certain things to be seen in Kaira from which other parts of India might benefit. Mr. Calvert asked whether you could popularise the practices of Kaira?—That was in relation to stacking of fodder and the management of cattle, the principle of growing fodder crops and of stacking against bad years.

6383. The district to which you refer is mainly light soil, I think?—Yes.

6384. The soil is very similar in its character to the alluvial soil of Northern India, and there are widespread tracts of similar soil throughout India?—Yes.

6385. Why should it be only in that particular area that we find this superior management of cattle? You say the people look after their cattle because they are good, but are not the cattle good because the people look after them?—Of course, the ruling feature of that tract is that there is a great pressure of population and great competition for land and the land is very good and very valuable. Therefore cultivation tends to be rather intensive, and that leads to better and fewer cattle.

6386. But the cattle are good because the people look after them; I think that is the answer, and not that the people look after them because the cattle are good?—It is not only that. I think a particular tract which is favourable to cattle-breeding produces a good breed of cattle just as the Deccan produces a small and hardy race and Gujarat a large and heavy race.

6387. You instance good breeds and little common grazing as being two factors that have accounted for the Kaira cattle. Is there not a reason why we should link these two things together? What about the enclosure of land in Gujarat? Are the fields more or less commonly enclosed than in other districts in which you have worked?—Very much more enclosed; nearly every field is enclosed.

6388. Is not this district an ordinary example of the effects of enclosure? Gujarat has been reproducing the experience of many other countries?—It certainly is a very strong feature of Gujarat and more particularly in parts where land is more valuable.

6389. It is a special feature of Gujarat as distinct from other areas?—Yes.

6390. Gujrat farming is an after-effect of enclosure?—Yes, that may have something to do with it.

6391. I think it has more than "something;" it is at the root of the matter. There is one other point. If there is very little common grazing, how do cultivators manage to get grass for their cattle?—They do not feed them on grass; they feed them on the produce of their food crops.

6392. Is it not common in the Kaira district, as it is a little further south, to have the field *shedha* or border?—They have these *shedhas* in Kaira, but I do not know if they contribute very much to the stock of fodder. They mainly depend upon the bajri crop for fodder.

6393. When the cattle have a breathing space, have you noticed how the grass on the field border is utilised?—I suppose they stack it.

6394. The cattle graze on it. That is the second contributing cause to the quality of the cattle. They have always got some food in the interval of work?—Yes.

6395. *Dr. Hyder*: You say, on page 337, that Government, as the ultimate owner of the soil, should as one of its duties be prepared to carry out work for the improvement of its lands. Have you considered whether the re-grouping of scattered fields might be one of those improvements?—No. I had not got that in mind when I wrote that.

6396. You say that the action contemplated by the State in regard to fragmentation would be ineffective. Would you have that provision deleted from the proposed Bill?—It does not apply to fragmentation, which is a matter of private interests. What I meant was that the State is the ultimate owner of the land, and it seems to me properly the function of the State in some cases to undertake protective or improvement works so as to improve its own lands. The State, as the ultimate owner of the soil, benefits in the end by any way in which the land is protected or improved.

6397. If the State is the ultimate owner of the soil, surely the landowner should compel the tenants to re-group their lands so that the land may produce more?—I should call that an illegitimate extension of the interference of the State. What the State ought to do is to look after the general improvement of its property, and not interfere with other people's management of their own rights.

6398. *Sir Chunilal Mehta*: Is the storing of fodder and stall-feeding exclusively confined to Kaira?—I have not met it anywhere else, but I have no experience of many other Gujarat districts.

6399. Take the Deccan, the Satara district. Do they not store fodder there and adopt stall-feeding especially for draught bullocks?—I have not served in the district, so I cannot say.

6400. You are speaking of Kaira only here?—I am speaking of Kaira compared with Kanara.

6401. Have you any agricultural bias schools in your district?—One or two; one and a half really, because one school is not a true agricultural bias school. There is only one real agricultural bias school, which has 14 boys.

6402. Do you think it might meet your requirements as mentioned in your first paragraph?—As far as I understand their working, I think they are distinctly the right sort of thing and ought to replace the ordinary primary schools entirely.

6403. With regard to fragmentation, have you seen the Draft Bill that Government have recently prepared?—I saw the Draft Bill that was sent round for opinions. I do not know whether it has been recast since I saw it.

6404. Can you tell us whether the cultivators in Kaira have got sufficient spare time for which spare-time subsidiary industries could be introduced?—Generally speaking, no. The cultivating season in Kaira goes on for a long time. Actually you find crops on the fields right up to the end of March. Cotton is a very late crop. I do not think cultivators in Kaira have a very long period of idleness.

6405. Therefore there is not much scope there for spare-time occupations?—I should say no.

6406. Not even in the evenings?—I do not think you want to press the cultivator to work in the evenings.

6407. Was not propaganda of an intensive kind for this purpose carried on in your district?—Yes.

6408. With what result?—None.

6409. Regarding these assistance suits under section 86, have you had many examples of requests for assistances?—I have had assistance suits to deal with as an Assistant Collector. They do not come to the Collector. As an Assist-

ant Collector, however, I used to hear the appeals from these suits, and my sympathies were always with the cultivators.

6410. With regard to your proposal on page 340 about planting of casuarina trees for fuel purposes, does that apply to Kanara only or to other parts as well?—I have seen it working in Madras. There are many survey numbers entirely planted with casuarinas, which must obviously supply the demand for fuel in those parts very largely.

6411. Will that be possible in Kaira?—I do not know whether casuarina would grow there. It has never been tried. Something else might be tried. It is a good tree-growing area and they should grow some kind of tree.

6412. Have you put this idea before the Forest Department at any time?—No.

6413. *Sir Ganga Ram*: Are there any big landlords in your district?—Yes.

6414. Who do not cultivate themselves but let the land to tenants?—Most of the biggest landlords in my district cultivate themselves, either they themselves or members of their joint families.

6415. Do they take cash rent or participate in kind?—Some in cash and some in kind. They have a system of a half-share in the produce or else cash rent.

6416. Do you store any fodder for times of famine?—It is going to be done. Government have recently leased big grass-growing areas in a certain taluka to a contractor on condition that he should store a certain amount against famine.

6417. What kind of fodder?—Grass. The people themselves store the other.

6418. Is not the stalk of some food crops used? The *ragi* stalk, for instance, is very good?—The cultivators keep every stalk of *ragi* for their cattle.

6419. Cannot you bale it and keep it in stock in large quantities? Cannot it be had cheap when there is a bumper crop?—Cultivators know that and they stock it for themselves. It is not wasted. They always reckon on having at least one year's supply of fodder in stock.

6420. What about *juar*?—*Juar* is replaced by *sundia* in Kaira. They grow it very largely by well-irrigation after the other crops. It is a *rabi juar*.

6421. *Mr. Kamat*: I want to be sure of your opinion with regard to section 86. You said that these suits were chiefly for rents. Apparently that is the case, but in actual practice in many cases, is it not true that a man who wishes to lend money, say Rs. 1,000 at 9 per cent. and has to recover Rs. 90 by way of interest, takes a rent-note from the cultivator, although it is not a real rent-note, and files the suit?—Yes, and that is why I have put it down as one of the causes of the present indebtedness.

6422. It is not between the landlord and the tenant but between the lender and borrower?—Yes.

6423. *Professor Gangulee*: How many Taluka Development Associations have you in your district?—Two were formed in the Kaira district during the last rains. I have had experience of one in Sirsi, in the North Kanara district, which worked quite well; they obtained good sugarcane crushers and let them out to members of the Association.

6424. Did these Associations seek your assistance and advice?—They used to consult frequently on various points.

(The witness withdrew.)

**Mr. C. O. LOWSLEY, Superintending Engineer (on Special Duty),
Bombay Presidency.**

Replies to the Questionnaire.

Introductory.—The appointment of a Superintending Engineer on Special Duty to investigate minor irrigation works as a means of protection against famine has been in existence since September 1925.

The investigation is confined to the scarcity tracts of the Bombay Presidency (excluding Sind) and although the period of one year in which investigation has been in progress is too short to form definite proposals much information has been obtained which, combined with previous experience, may be of use to the Royal Agricultural Commission.

The scope of the investigation is given in G. R. No. 4142—24, dated August 24th, 1925, a copy of which is attached.*

The subject deals closely with agricultural improvements especially in connection with the utilisation of all natural resources of water-supply which can be applied to the whole Presidency proper without restriction.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(b) I would recommend the construction of model schemes of all types of land improvement and the conservation and utilisation of water resources in suitable and most accessible agricultural centres as object lessons to the cultivators.

Such schemes should be carried out by a reliable agency and the working of the scheme handed over to the Agricultural Department.

One such scheme is about to be constructed in the Ahmednagar district. On completion of construction the owner of the land will farm it under the instructions of the Agricultural Department fulfilling a two-fold object, *viz.*, first hand experience to the cultivator and the acquisition of reliable information on the cost and return which may be expected from farming under such conditions.

(c) By providing an agency for preparing schemes and carrying them out. Up to a few years ago the only means a cultivator had of obtaining expert advice was the goodwill and friendship of Government officers and subordinates working in his area. A Land Development Officer (an Assistant Engineer of the Public Works Department under the Agricultural Department) was appointed for the Deccan three years ago to investigate and prepare rough projects of minor irrigation schemes. One man in such a large area was naturally swamped with work, and there was no special agency to carry out his recommendations.

Co-operative Societies and Taluka Land Development Associations are taking keen interest in this work and are able to arrange for financing small schemes but they have not the technical knowledge necessary to prepare and execute schemes of any magnitude.

On the appointment of a Superintending Engineer on Special Duty to investigate natural resources for the protection of lands from famine in the scarcity tracts of the Bombay Presidency it was found that the duties of the two officers overlapped with the result that the post of Land Development Officer was abolished and two subordinates under the designation "Bunding Officers" were sanctioned for giving advice to cultivators outside the scarcity area.

The Superintending Engineer on Special Duty at present has a staff of 3 Assistant Engineers and 8 Survey Parties each party consisting of a Surveyor and 4 Assistant Surveyors. This staff which is undoubtedly of

* Not printed.

great use has to work over such a large area that it only touches the fringe of the problem. (The scarcity area as at present defined covers some 40,000 square miles and it is obvious that many years must elapse before individual agriculturists can have a hope of obtaining the advice they require.)

From my experience of the past year and my experience as an officer on ordinary duty, I am convinced that a large percentage of cultivators will adopt expert advice if means are provided. With the increase in outturn of trained men from Agricultural Colleges the demand for a special agency will gradually decrease but until trained men are available and spread over the Presidency a special agency is a necessity and needs expansion.

Formerly the individual cultivator with a view to improving his lands and utilising the natural resources of water-supply applied for a loan to carry out his proposals. Enquiries into the conditions resulted in the sanction or refusal of the loan. In the former case the cultivator was left to carry out his scheme without expert advice more frequently than not resulting in failure. With a special agency of sufficient proportions his scheme can be worked out for him and carried out for him.

The cost of this agency must of necessity be high. The survey of a small scheme is practically the same as that for a large one, often a large amount of time must be spent on the preliminary survey of a scheme to ascertain its feasibility and rejected schemes add to the overhead cost.

To sum up, I would advocate a special agency to work in districts outside the famine area in addition to the special agency now employed, within the famine tracts. Whether this agency could be carried out under the existing divisional staff is a matter for later decision but I strongly recommend that additional staff in a Division should be for this special duty only and not linked up with the ordinary duties of the present staff.

QUESTION 5.—FINANCE.—(b) I think fuller use of the *taccavi* system will be made if loans are given on easy terms for carrying out land improvements and minor irrigation works when such schemes have been prepared or approved by expert staff.

In this connection Agricultural Associations can give much help to the individual cultivator in arranging for the loans.

The security would be on the lands concerned but as compensation for the easy terms proposed Government would have the satisfaction of knowing that the schemes were sound and that the loan would be utilised for the purpose for which it was intended.

QUESTION 8.—IRRIGATION.—(a) (i) In the course of my tour of investigation during the past year I have met with demands for large irrigation schemes in Gujarat for the Ahmedabad and Kaira districts which are being investigated by the Irrigation Department.

Irrigation in Gujarat is chiefly from small tanks, the obstacles to improvements and extensions are dealt with below.

(ii) (In many districts of the Presidency, the Deccan especially, there are sites for small tanks. Although most of them will not have sufficient storage capacity for direct irrigation much can be done by constructing such tanks as percolation tanks to improve the supply in wells.)

Sites for such tanks are being investigated and surveyed in the scarcity tracts at the present time but there is no reason why the operation should not be extended to normal tracts.

Such schemes will not give a high return on the cost involved but there will be much indirect benefit to the agriculturists generally.)

(iii) Throughout my tour of investigation I have met with demands for boring machines and I think there is scope for increasing the plant and staff under the Boring Works Division and the Agricultural Engineer who are employed on this work.

The demand is especially great in the Kaira district of Gujarat where the subsoil water level has fallen and the wells have ceased to give an assured supply.

The obstacles to the extension of irrigation by each of the above methods are:—

(i) I consider the chief obstacle to the extension of irrigation by canals is financial. The cost of labour and materials has increased out of all proportion to the revenue realised from irrigated crops with the result that otherwise satisfactory irrigation projects are not productive works.

There is also the question of the value of irrigation water in different tracts. In a tract of erratic rainfall there may be great demand or no demand at all for irrigation water.

(ii) The obstacle to the construction and improvement of small tanks is chiefly the silting which occurs and the subsequent losses by evaporation and absorption which increase as the tanks become shallower.

The cost of clearing silt from a tank may be taken at Rs. 30,000 per one million cubic feet whereas the value of one million cubic feet of water for irrigation purposes is about Rs. 60. It is obvious that silt clearance to increase the capacity of a tank is financially impossible.

In course of time there is the hope that cultivators will appreciate the value of tank silt for improving their lands and that permission will be sought to remove silt from tanks gratis.

Another obstacle to the construction of tanks in areas in which they are badly required is the small flat catchments; this is especially the case in Gujarat where the well-water is frequently brackish and a tank is the only means of providing a village water-supply.

The rainfall in Gujarat has been on the decrease for many years and the shortage of tank supply has become chronic.

Fortunately this year the rainfall throughout Gujarat has been almost if not quite a record, (Ahmedabad 49 inches compared with the normal of 28) which should alleviate these conditions and give time for investigation regarding improvements.

(iii) *Wells*.—The obstacle to the sinking of wells is the uncertainty of success. The individual cultivator who desires to have his own well is loath to take a large advance which is a burden for a generation if the well proves a failure.

The failure may be in not striking water or in obtaining brackish water. The activities of the Agricultural Engineer in carrying out borings and the Water Diviner in selecting sites for wells is increasing the demand for wells.

QUESTION 9.—*SOILS*.—(a) (iii) Apart from forest operations for this purpose the only means are by terracing and by *tals* (earthen embankments).

The terracing at present carried out by the average cultivator is decidedly good and little in the way of improvement can be suggested. The chief features of good terracing are to obtain the maximum area of level land—sufficient area to facilitate ploughing—with the minimum amount of earthwork.

The faces and edges of *tals* require protection and a slight reverse slope to the terrace is advantageous.

Tals as at present constructed by the cultivator can be greatly improved. The cultivator has no means of finding out the best site and alignment of his *tals* and he generally favours low ground which necessitates unnecessary earthwork and endangers the safety of the *tal* in times of abnormal rainfall. Advice is being given to individual agriculturists in the scarcity tract by the staff on special duty and there would be considerable scope for extending this aid through the agency suggested in answer to question 3 (c).

QUESTION 25.—*WELFARE OF RURAL POPULATION*.—*General*.—The most urgent need of the rural population is a village water-supply and although in most districts this need has been met there are still numerous villages, in the

scarcity tracts especially, where (the village water-supply does not last throughout the year and for months man and beast obtain water from a distance extending to 5 miles.)

A survey of such villages would be most useful and each district should have a list of villages with a failing water-supply. A definite programme of investigation and construction could then be proceeded with.

In the course of my general investigation I have been given numerous instances of villages suffering from this want and my staff is quite insufficient to deal with such cases at the pace which the amelioration of these conditions demands.

Oral Evidence.

6425. *The Chairman:* Mr. Lowsley, the Commission is very much obliged to you for your written evidence. I think the germ of your ideas is formulated on page 357 of your notes. You state, "I would advocate a special agency to work in districts outside the famine area in addition to the special agency now employed, within the famine tracts?"—Yes.

6426. Do you think the nature of the problem differs as between these two districts, or are you more concerned with the extension of the agency?—I am concerned with the extension of it.

6427. You do not think that the problem is different as between these two places?—I do not think so. Possibly the schemes may be better outside the famine tracts.

6428. On page 356 you recommend the construction of model schemes of all types of land improvement and the conservation and utilisation of water resources on suitable and most accessible agricultural centres as object lessons to the cultivators. How do you propose to finance these?—Government will finance them.

6429. Would you hand them over ultimately?—My idea is that Government should carry them out by a Government Department and then hand them over to the Agricultural Department, the schemes to be run by the cultivators but supervised by the Agricultural Department.

6430. They will cost Government a certain amount of money?—The man would probably be prepared to pay something either as a loan when carried out, if he gets them back, or they might be given to him. They would be small schemes—they would not cost much. These small schemes only cost Rs. 10,000 each.

6431. But in the aggregate, over a large area?—These are model schemes for which I think a matter of ten in each district, or even less would more than suffice.

6432. I was interested in the figures you have given on page 358. You give there the cost of clearing silt from a tank as Rs. 30,000 per million cubic feet, whereas the value of a million cubic feet of water for irrigation purposes is about Rs. 60, a proportion obviously insufficient to pay interest and amortisation. That really means that you cannot dig a tank at a profit?—No. The only way is to put an embankment round the tank and make it that way.

6433. It appears that cultivators are able to design small schemes without assistance up to a certain point, are they not?—On a very small scale. They are capable of putting small dams across *nullahs* and embankments to a certain extent.

6434. Is there a sort of local inspection in such matters, or does each cultivator think for himself?—Each cultivator thinks for himself, but for the last 2 years the Agricultural Department have had their own Bunding Officer and Land Development Officer, both of whom give advice and help.

6435. How do the cultivators fix the levels?—I am afraid they have no means at all, unless they can get the help of some subordinate in the vicinity. They have no levels.

6436. Do they take a trickle of water with them and see how it runs?—I think they do it by eye. A great feature is that they try to have their *tals* on their survey boundaries, and will often sacrifice the efficiency of the *tal* simply to have it on their own boundary.

6427. (Do you think that if this scheme of minor irrigation works is fully developed up to the limit of economic possibility a great contribution to the improvement in agriculture in this Presidency can be made?—I think so, because we should be harnessing the small *nullahs* which at present fill the rivers and go to waste. Big rivers are difficult to harness, but by harnessing small streams at their source we could have small schemes which would pay and improve the general condition of the districts.)

6439. (Have you ever attempted over a given unit of cultivable land to estimate what the aggregate increase in crop production might be as a result of the development of this idea?—No, but in 1908 the Director of Agriculture carried out one of these schemes at Rahuri in the Ahmednagar district. He had a scheme of flooding the land. The land which was soaked gave a return of 921 pounds of *juari* and 1514 pounds of fodder. The ordinary land alongside gave 312 pounds of grains; the fodder is not recorded. With wheat the soaked land gave 493 pounds of grain and 452 pounds of *bhoosa* stalk; the ordinary land gave 240 and 200 pounds.)

6439. What scheme was that?—A scheme for soaking land, much as I am trying to do it now, by leading water from small *nullahs* on to the land and soaking it and then growing a *rabi* crop after one or two soakings. It was done in Rahuri with those results, but after that, apparently, it was lost sight of. I quote from the Report of the Department of Agriculture for 1908-09, page 34.

6440. Was it a normal season?—The rainfall for that year was 21 inches. I think that is about the normal.

6441. *Sir Henry Lawrence*: It gave three times as much *juar* and twice as much wheat?—Yes.

6442. *The Chairman*: Cultivation being carried on under the direction of the department?—The land was hired from Dr. Ballantyne, who is a missionary there. Whether it was farmed by him or by the Agricultural Department is not stated, but I came across this and I thought it was very interesting.

The Chairman: The figures are very significant.

6443. *Sir Henry Lawrence*: Have you any idea as to the total area over which your operations are capable of extension? How many acres of land can you improve? You have given us these striking figures to show that the outturn might be increased three times with *juari* and twice with wheat. Over how many thousand or hundreds of thousands of acres do you think such improved results are possible? Have you ever worked that out?—I have not worked it out. I have an idea as to what can be done each year, but I do not know what the total area would be.

6444. Can you work out a scheme to show what is the maximum profit possible from the continuance of your operations over a number of years, and let us have that?—Yes.

6445. *Sir Ganga Ram*: Do you issue an Annual Report of the Irrigation Department of the Bombay Presidency?—There is an Irrigation Report.

6446. An Annual Irrigation Report?—Yes. My appointment has been in existence only one year, and there has been no report so far, but an Irrigation Report for the whole Presidency is issued annually.

6447. Have you studied the Irrigation Reports of the Punjab? Have you ever seen them?—I have seen them; they are circulated.

6448. Your service has all along been in this Presidency?—Yes, and in Sind.

6449. As regards the figures which you give on page 358, do you not think that you have made a mistake? You say Rs. 30,000 per million cubic feet. That works out to how much per thousand cubic feet?—Rs. 30.

6450. This is the figure I get, but is that really the cost?—The lead is the question.

6451. We generally put down Rs. 3 per thousand?—That is for ordinary canal clearance, which is an entirely different thing. This is for tanks.

6452. What is the depth you go to?—To do any good you must go to 8 or 10 feet, or even more; but it is the lead that costs the money.

6453. If you allowed the zamindars to dig it and take it away themselves, would not they appreciate the value of it?—They do not yet. Occasionally we get a demand for the silt, but there is very little at present.

6454. It is quite worth the money. Do these minor irrigation works come under your duties?—Yes.

6455. Extension of minor works?—Yes.

6456. When you submit a project to Government do you show the direct water rate?—So far I have always been dealing with *bandharas* and *tals*.

6457. Do you show the direct water rate?—Yes.

6458. Do you not show the indirect benefit through enhancement of revenue?—I note in my report what it is.

6459. When do you show the return of the project by adding the two together?—I generally deduct the protective value from the ultimate cost and work out my return on the balance. There is a protective value which has been worked out by the Famine Commission of 1906, which proves that in the famine tracts it will pay Government to protect land at Rs. 171 an acre. If I prepare a scheme costing Rs. 60,000 to protect, say, 50 acres, I deduct from the cost of that 50 times 171 and work out my return on the balance.

6460. Why do it by this indirect method? Why do you not say the direct receipts by water rates are so much, sale of trees so much, indirect receipts through enhancement of revenue so much; total so much; percentage so much? Is not that a more intelligible way of doing it?—I think mine is quite direct. It gives all the information required, and also you have got the direct return on the whole capital and also on the capital after the protection.

6461. What I am driving at is this. Is the indirect advantage through enhancement of revenue taken into account when you determine whether the project is paying or not paying?—That is shown, and it is taken into account in the famine tracts.

6462. If both these items taken together show that the thing is paying 5 per cent. or 6 per cent. would Government be satisfied?—Government would be perfectly satisfied.

6463. You say, three times *juari* and twice wheat. That is, how many maunds per acre?—It was *juari* 921 lbs., i.e., 11 maunds; and on the ordinary land it was 312 lbs., i.e., 4 maunds. Wheat was 493 lbs., i.e., 6 maunds; on the ordinary land it was 240 lbs., i.e., 3 maunds.

6464. Then, by irrigation you only expect about 12 maunds?—It is not irrigation. It is by soaking the land.

6465. How much do you expect the yield of wheat to be by irrigation? How many maunds per acre?—I am afraid I cannot give that figure. This is from an experiment.

6466. You have given figures?—This is not irrigation. It was the result of an experiment conducted by soaking land. There was a small *nullah* running through the land which was dammed and the water was diverted to land and held up by *bunds*, and the land was soaked. Then that land was allowed to dry, and after that a *rabi* crop was planted. Alongside of that there was land which was not soaked with water and which only got the benefit of the monsoon.

6467. That shows the advantage of making *bunds*, not of irrigation?—No. You cannot call it irrigation.

6468. Does boring of wells come under your purview?—No. That is under the Agricultural Engineer.

6469. Do they bore in existing wells or do they make new wells?—In some places they bore in the existing wells, and in some places they bore new wells.

6470. Does boring in the existing wells augment the supply?—Yes, in Gujarat, certainly.

6471. By how much?—I cannot give you definite figures.

6472. To what depth do you go?—It varies. For an ordinary well they generally go about 60 feet, I believe, in the part of Ahmedabad where I was. But deep borings are taken to 2,000 feet.

6473. Can they go as far as 2,000 ft.?—I think they have gone to 2,000 ft. in Viramgam.

6474. What is the size of the tube?—I think it is five inches, but it is not my department, and I would rather not give any definite information on the subject.

6475. *Sir Thomas Middleton*: Your work involves the carrying out of a number of surveys?—Yes.

6476. What is the main work involved in the survey itself? Is it a question of levelling work or does soil examination come in?—There is no soil examination, beyond seeing that it is suitable soil for my schemes, that is all I am concerned with.

6477. Your survey is engineering?—Entirely engineering.

6478. *Dr. Hyder*: On page 358 you say that the chief obstacle at present to the construction of these works is financial?—Yes.

6479. Are your rates pretty low?—I should think they are.

6480. If you increased the rates would the increase in yield be enough to justify the cost of the works?—I think it would. You mean with a view to increasing the rates?

6481. Yes. The point is this. You say that the chief obstacle is financial. I submit that if the project is satisfactory it can only mean that it will bring extra yield. If from that extra yield you can get for your department so much that it can balance the cost incurred, would you consider that project to be satisfactory?—Yes.

6482. Then the present rates are too low?—I think so, because in places I have been to and asked the people what they are prepared to pay, they are often prepared to pay higher rates than are at present in existence if they can get a scheme.

6483. Have you or your Government ever ascertained the value of water in the different tracts in the Deccan?—The rates vary according to the tract, but I think it might be on a more detailed basis?

6484. At present the Bombay Government or your department does not possess the data on which to base the rates?—They are all based on settlement revisions which are carried out every 30 years, and the rates are revised from time to time.

6485. Quite so, but neither your Government nor your department know what is the value of water in different tracts?—Not to my knowledge.

6486. Please look at the same page. The cost of clearing silt is high?—Yes.

6487. Then, you say that the value of one million cubic feet of water for irrigation purposes is about Rs. 60. If the financial aspect of these projects is as you have stated, then you would not think that the State can incur this huge expenditure?—On the clearance of silt?

6488. Yes?—Certainly not.

6489. Is there any method which the people of this Presidency can adopt other than voluntary or forced labour, by which they can do the clearing for themselves?—I hope that in time they will appreciate the value of the silt and carry out the work themselves.

6490. Do you not think such works were carried out in the past by co-operative effort on the part of the people themselves?—Yes, I think most of the old tanks were constructed by voluntary effort and co-operation of the villagers.

6491. At present they do not undertake such co-operative work, but rely on the State?—They say they will give help by giving so many men for a certain time; they will undertake to do so much earthwork themselves. There is that amount of co-operation, especially in Gujarat; they have told me that if I will get the project through they will provide so many men for a certain time; they say, "We will do so many cubic feet per head;" they undertake that.

6492. Then I suppose the extension of such works both in Gujarat and the Deccan would be possible if the State provided a certain amount of money and for the balance you relied on the co-operative effort of the people?—Yes, that is the object now. In the carrying out of all these village tanks they are prepared either to give something in labour or a contribution.

6493. And that is the policy which is being carried out now?—Yes.

6494. The Bombay Government have adopted that policy?—Yes.
6495. *Sir Chumtilal Mehta* : Your department was specially created in order to deal with famine tracts?—Yes.
6496. Because the money could only be provided from the Famine Fund?—Yes.
6497. Government had no resources otherwise to enable you to undertake your investigation in any except scarcity tracts?—Yes.
6498. It has been in existence only about a year?—Yes.
6499. In answer to Sir Henry Lawrence you said you would be willing to supply the Commission with the possible area that might be covered by these small schemes?—Yes.
6500. How will you arrive at that area?—By going round and seeing from the maps of the cultivable areas where I can put any schemes into operation; that is my idea. I can get a very good idea of the area. I do not say the figures will be accurate, but they will give an idea.
6501. Wherever you have been, have you found a great demand from the people for such schemes?—Great demands.
6502. Are they in a position to tell you whether in their opinion a scheme in such and such a position will be possible?—Yes, they have always got a site, and their ideas are generally quite good. In the vicinity there may be a better site close by, but they have a very good idea of what can be done.
6503. So that from such data also you can collect roughly the information that is being asked for?—Yes.
6504. In calculating the acreage that will be benefited by these schemes, what will you do with regard to tank sites? You bund up the water of a *nullah*, and create a sort of small tank?—Yes.
6505. You do not propose that from that tank water should be given direct?—It depends on the tract.
6506. In your note you say the result will be only to supplement the wells below the *nullah*?—Yes.
6507. In calculating the area that will be benefited, you will have to allow for the area which will be cultivated by the wells which are not useful?—Yes.
6508. There is a demand in all districts; it is not limited to the Deccan; it exists in Gujarat and in Khandesh. Everywhere people want these works to be done?—Everywhere.
6509. You find this demand comes through Taluka Associations, and wherever there are not Taluka Associations people come forward and ask for them?—Even individuals come forward and ask for these works to be done.
6510. You have told the Commission that you have no accurate figures as to the increased produce that cultivators will get under a scheme, just as in the case of the figures you quoted about this experiment in 1908. You are not in a position to give figures for any schemes you may have undertaken?—Not at present.
6511. But have you any indirect way of judging it fairly approximately in the way of the yield of crops?—No. My work is rather between complete irrigation and ordinary monsoon. It is an in-between stage.
6512. But I suggest to you that you can make this calculation fairly roughly by the fact that the cultivators are prepared to give you by agreement so much return on the capital, say 5 per cent. or 6 per cent. on any scheme that you have got. Suppose you spend Rs. 25,000. On that scheme they agree to pay 5 per cent. on the capital as increased land revenue?—Yes, they say they are prepared to pay a certain rate per acre.
6513. They would not be prepared to pay that rate unless they found that the produce obtained by the water received from your scheme would cover, and more than cover, the tax they are prepared to pay to Government?—Certainly not, they would not.
6514. So that that gives you some idea as to the increased produce that will be available to the cultivator?—Yes, the difference between the present ordin-

ary rate and the rate they are prepared to pay gives an idea. But take the scheme at Nadanvadi in the Poona district. There is a scheme proposed there. The irrigation rate in the vicinity of that scheme is Rs. 8 per acre. The people who want that scheme have told me that they are prepared to pay Rs. 12, which gives an idea of the value of water in a scarcity tract.

6515. *Dr. Hyder*: Would this increase of Rs. 4 cover the additional cost?—The scheme is being surveyed now, but I think it is a very good scheme, and I think we should be able to carry it out with the ordinary rate of Rs. 8; I think at Rs. 8 it will be a paying project. But my idea is that we should prepare these surveys and prepare the project, and not ask whether it would pay 5 per cent., but find out what the rate must be to pay Government, say, 3, 4 or 5 per cent. If the people are then willing to pay that amount the scheme can be carried out. The objection, I am afraid, is that the people will naturally say that if they agree to pay Rs. 12 in a tract where the irrigation rate is Rs. 8, the Irrigation Department will raise the ordinary rate from Rs. 8 to Rs. 12 straight away, and I am afraid there will be a great deal of propaganda against it. But certainly there are sites, such as, for instance, Nadanvadi, where they are prepared to pay more than the existing rates to get the water.

6516. *Sir Chunilal Mehta*: Would you also be able to give the Commission a rough estimate of the cost that would be involved in benefiting the acreage that you want to work out?—Not just at present, but I think in the course of another 6 months or a year, I should get a fair idea of the cost of these schemes per district or per thousand square miles or some other unit. I think I can then give a very fair idea of what the cost will be.

6517. *The Raja of Parlakimedi*: Have you got any artesian wells in the Province?—I think in Ahmedabad there are some.

6518. Are there many?—It does not come under my special duty, nor have I had any experience. I have been round with the Boring Executive Engineer and I have only taken a certain amount of passing interest in it, but I cannot possibly give you exact information on the subject.

6519. They are very useful in dry districts, are they not?—Very useful provided they get sweet water; but I understand that is one of the difficulties in Gujarat, that these wells do not always give sweet water.

6520. There is an instrument now in use to indicate where an artesian well can be sunk, something which indicates the water level?—Yes. I believe Major Pogson, the Water Diviner, has an instrument of that kind with which he checks his results. He is trying to find out whether the instrument is really reliable. He has an instrument of that kind, I know.

6521. For carrying out minor irrigation works do you not encourage local contractors to take them up?—At present all my schemes are carried out by the ordinary district agency, either the Public Works Department or the District Local Board.

6522. As a department?—Yes.

6523. Not through contractors?—If the people are willing to carry them out themselves, they are at liberty to do so. Up to the present time I have only had one scheme which a man wanted us to carry out departmentally, although it was his own private work, and he was willing to pay the 24 per cent. establishment and other charges. I think they will undertake some smaller works themselves, but at the present time they certainly prefer the works to be carried out by a recognised agency.

6524. What is the difficulty? Is it because of the lack of organisation or because payment is not made regularly?—I think that one difficulty is payment; and also they have to engage skilled labour. For most of these works some skilled labour is required; usually the village mason, if there is one, is not good enough, and they have to get men from larger centres. I think that is the chief reason.

6525. What about earthwork, special excavation of channels and such other things?—Earthworks they are perfectly prepared to do; but they always need

some advice and help in the alignment. If they are left to do anything of that kind on their own they do not carry it out satisfactorily.

6526. As regards utilising rivers, have you tried to make use of river water by making a cut at high ground, without having a regular embankment?—I am afraid I do not quite follow.

6527. Near a high bank, we can by deep cutting divert the river for irrigation?—Not without some dam across the river to raise the level; otherwise you get such a distance from the river that you probably lose all your water on the way.

6528. Where you have a good supply of water in the river, that has been tried in certain places, has it not?—I do not know of any place in the Bombay Presidency where it has been done; and it could not be done without some dam across the river or *nullah*.

6529. By means of groins across the river a certain portion of the river water can be made to go to your high cutting?—Groins are the equivalent of the dam. Groins are there to raise the level, I presume. I suppose the idea is that the groins would silt up and raise the level to command your land.

6530. *Professor Gangulree*: In surveying the area that would be brought into cultivation, do you think the Department of Agriculture could be of any use or help?—No, I do not think they can; it is entirely an engineering survey.

6531. Can you possibly develop any scheme without some knowledge of soil conditions, the depth of soil, its texture, its fertility, and so on?—For my soaking schemes I know I must have black soil, and two or three feet of it. The ideal conditions for that are that you have black soil with *murum* or something underneath, so that you get the *murum* soil for the site of the dam and the black soil to retain the moisture.

6532. On page 356, with regard to demonstration and propangada, you say there was no special agency to carry out the recommendation put forward by the Land Development Officer. Have you any idea as to what should be the nature of this agency?—My idea is to have a special agency, somewhat similar to the appointment I now hold, but for the same work outside the famine tract. I think, possibly, it might be done by the existing district staff, with an additional man in the district solely for that work, and not linked up with any other work. I am afraid these smaller works are lost sight of in the ordinary district, unless there is a man specially put on to that work.

6533. Are you familiar with the work of Taluka Development Associations?—I had no experience of them until last year, but I have met Taluka Associations in various districts since I took up this appointment. I think they are extremely useful. Where there is one man who possibly has no means of getting to the fountain head, the Taluka Associations come along, and they are most useful in taking me to sites and suggesting sites; but they have got no one to give them technical advice.

6534. None of the organisers of the Taluka Development Associations have technical knowledge?—No. I have met one or two retired engineering men on them. I met one in the Panch Mahals district. Probably there are others, but I did not know they were retired engineering men.

6535. You think that the organisers of these Taluka Development Associations ought to have some sort of training?—I think it would be very useful if on every Taluka Development Association there was a trained man. I do not see why a retired man in the vicinity, who would work on most of these societies, should not be on them.

6536. In other words, without trained men, Taluka Development Associations could not possibly develop in the way one would like to see?—Not in the same way as my department does.

6537. Village water-supply, you rightly point out, is the most urgent need of the rural population. Are there any possibilities of tube-wells?—In most of the villages, if there is a possibility of a well, they have got a well or wells. Where they chiefly want a tank supply is in Gujarat, where their wells are frequently brackish, and they are absolutely dependent on tank supply.

6538. I was referring to tube-wells?—A tube-well merely supplies an ordinary well. I have had application for boring for tube-wells in Gujarat and I think a good deal can be done in that direction.

6539. At present is there an officer to investigate the possibility of tube-wells?—It all comes under the Boring Division and the Agricultural Engineer.

6540. For tube-wells?—Tube-wells, no; I do not think there is any special agency now.

6541. *Mr. Calvert*: Under whom are you working?—The Revenue Department.

6542. To whom do you report?—To the Secretary to Government, Revenue Department.

6543. I cannot quite understand your finance. The example you give shows that you get 240 lbs. per acre of wheat?—Yes.

6544. Do you mean to say that there is land in this Presidency being cultivated which yields only 240 lbs. per acre?—I should think there is a good deal. This is in the scarcity tract, where the rainfall is precarious.

6545. Practically, that is 4 grains return for one of seed. Is that right?—Those are the figures.

6546. Would you let me know, roughly, the cost of the improvement which doubled the outturn? What would it come to per acre?—Rs. 7 per acre.

6547. The whole cost?—Yes.

6548. Do you consider that your work is a business proposition, or just official philanthropy?—The irrigation will be a business proposition, both by the direct and indirect benefit from the schemes. We have got indirect benefit in the famine tract, which can be put against the capital cost, and we also get some direct return from the rates.

6549. There are two methods of finance suggested; one which suggests that you should report on whether the cultivators would pay a rate which would bring in a fair return on the expenditure?—Yes.

6550. Secondly, you suggest *taccavi* loans?—Yes.

6551. Two quite separate methods of finance?—Yes.

6552. Will these schemes then pay interest and sinking fund?—I doubt it.

6553. Your soaked ground returns you about 6 maunds per acre?—Yes, rather more, 8 maunds.

6554. Three maunds, i.e., 240 lbs., per acre could not possibly pay the cost of ploughing and reaping?—That is wheat. The *juar* is 12 maunds against 4.

6555. I am talking about wheat. The net return on your soaked ground on wheat is about Rs. 16 per acre, that is 3 maunds?—Yes.

6556. Do you think that will pay and be a business proposition?—On the wheat alone?

6557. I am taking the wheat?—That 3 maunds is what they have grown in the monsoon. On that they only pay the ordinary rate of Re. 1 per acre, or Rs. 1-4-0.

6558. *Mr. Kamat*: About your soaking schemes, to what length of *nullah* bank approximately can you carry the water inside the fields?—That depends chiefly on the contours. Do you mean as regards the wastage of the water?

6559. No, I mean reaching the water inside the strip on land which you can sow along the *nullah*?—It entirely depends on the contours of the land, whether it will command it. But my idea of soaking schemes is rather that they should be small schemes up to about 20 or possibly 30 acres. The model at the Agricultural Show is for 13 acres.

6560. I want to know the limiting factor, whether the limiting factor in such schemes would be the volume of water in the *nullah* or the high bank, or the difficulty of *bunding*. What would be the limiting factor?—The first thing would be the flow in the *nullah*, the extent of the monsoon flow.

6561. Your first limiting factor is flow?—Yes.

6562. The second is the high bank along the *nullah*?—The second is the amount of level area which you have got that you can command.

6563. Taking these two or three limiting factors into consideration, what would be the approximate area of land which you could sow from ordinary *nullahs* in ordinary villages?—Can you give me a rough idea; 1,000 acres?—It is rather difficult to say what is an average *nullah*; they vary so much.

6564. I want to know the possibilities?—I should think that probably on a *nullah* of about 20 feet width, you may have two or three of these schemes doing 25 to 30 acres each. That is quite a small scale.

6565. That means two or three schemes, each of about 30 acres?—Yes.

6566. So that the utmost you can do, say on a *nullah* of 20 feet width, is about 90 or 100 acres?—Yes, to begin with; it may increase after. At the present time I am only putting one on each *nullah* to begin with; there will be room for expansion.

6567. We may take it then that the average possibility of *nullahs* like this is about 100 acres per *nullah*?—Yes; I should think so, as a very rough figure.

6568. *The Chairman*: I have not fully grasped the figures that you gave to Mr. Calvert. Do I understand rightly that the cost of improvement works out at about Rs. 7 per acre?—That was so in this case. The figures happen to be given here; the cost of the dam was Rs. 197. The dam commands 40 acres which could be cultivated in the same way if they were levelled and bunded, so that the reasonable cost of levelling and bunding a small water course would be Rs. 7 per acre.

6569. *Sir Henry Lawrence*: That is in addition to the Rs. 197?—Yes, I think it is.

6570. *The Chairman*: The increase in yield in return, of wheat, is Rs. 15 per acre per annum. Is that right?—The value of the crops?

6571. The additional value?—Yes, I should think that is about right.

6572. Are you quite sure?—I am afraid I am not quite sure.

6573. I would suggest to you that you might provide the Commission with a statement, giving the figures, as far as you can?—Yes.

6574. *Sir Chunilal Mehta*: Are *tals* under your charge?—Yes.

6575. Are you doing the *tals* now?—Yes.

6576. Or is the Agricultural Department doing them?—The Agricultural Department are only doing small things in the way of *wads*, much smaller things. I am only taking up more systems of *tals* to cover a greater area; the Agricultural Department are taking up the smaller agricultural schemes; they deal more with the individual man.

6577. Have you done any *tals* yet?—I have not actually done any, but I have got one scheme now in Sholapur.

6578. These *tals* cost very much less than your other schemes like *bunding* and so on?—About the same as the *bunding*; they cost much less than tanks.

6579. I meant tanks. *Tals* would cover a big area. They would be included in the returns that you propose to send to the Commission? They are under separate heads?—Yes.

6580. *Sir Ganga Ram*: Have you any principle on which you give a quantity of water to zamindars? That is to say, supposing a village has 1,000 acres, how much water would you give them? Are you in charge of any irrigation schemes?—Only minor irrigation works. I do not run them.

6581. Do you lay down any principle as to how much water a zamindar is to get?—No, I simply work out the contents of my tank to supply so many acres. That is to get an idea.

6582. How much water per 1,000 acres?—150 acres per cusec for *rabi*, or, if it is contents, 12 acres to the million cubic feet.

6583. One hundred and fifty for *rabi*?—Yes.

6584. What is it for *kharif*?—I do not deal in *kharif*; my schemes are all *rabi* schemes.

6585. But as an Irrigation Officer, what is the duty for *kharif*?—I am afraid I cannot give it you; it varies a great deal; I am afraid I cannot give you the duty for the *kharif* off-hand.

6586. We get 500 acres out of one cusec for *rabi*?—I am taking 150 at the present time.

6587. *Sir Henry Lawrence*: Have you got the figures for the assessment of that area which was producing 240 lbs. of *rabi* wheat?—No, I am afraid I have not.

6588. What is the average rate of assessment?—I should think about Rs. 1-4-0.

6589. The outturn of the land is very poor unless it is assisted by soakage?—Yes.

6590. You are speaking of the taluka of Rahuri and the average dry crop assessment there is about five annas?—I do not know.

Sir Chunilal Mehta: It varies from 4 to 6 annas.

6591. *Sir Henry Lawrence*: If you introduce your scheme, does the assessment go up?—Yes, the assessment will go up, but it cannot go up till the next settlement.

6592. It will not go up in consequence of the improvement?—Not unless they are prepared to pay voluntarily; it will be a voluntary agreement.

6593. It would be a voluntary agreement?—That is my difficulty at the present time, how these schemes are to pay.

6594. Unless there is a voluntary agreement there can be no increase in Government assessment?—No.

6595. And if there is a voluntary agreement, how long does it last? Until the next assessment?—Yes, I suppose it would be until the next assessment, and then either continue the voluntary contribution, or pay more assessment. But the voluntary contribution would probably be greater than the increased assessment.

6596. There is the alternative of either assessing the tax according to the voluntary agreement, or embodying it in the raised assessment?—Yes, there is the option.

6597. You do not know which plan is to be adopted?—It has not been fixed yet how it is to be done. I am taking agreements from these people that they are prepared to pay a certain amount extra.

(The witness withdraw.)

**Mr. S. S. SALIMATH, B.Ag., Deputy Director of Agriculture, S.D.,
Dharwar, Bombay Presidency.**

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—Education given at present in ordinary schools is not helping agriculture which is the basic industry of India. The atmosphere created by the teachers and other literary people, in rural areas of my division, is anything but agricultural development. In addition to reading and writing, education given in rural areas must be mainly agricultural.

In the Southern Division of the Bombay Presidency, Agricultural Education was started with a vernacular agricultural school at Devihosur in Dharwar district. About 150 boys have received training during the last 12 years and it is gratifying to note that 60 per cent. of the boys have gone back to their farms. Some students have done very well and have created good impression in their villages. Their farms serve us as good demonstrations. For the last three years, we have been receiving applications numbering to 100, while we can take only 15 to 20. A genuine demand for such schools has been created one for Belgaum and the other for the Bijapur district. The District Local Boards are taking interest in the matter. Recently we have some agricultural bias schools started and they too are attracting the attention of the cultivators. I have observed however that the short period training, which the teachers are given as a temporary measure at present in Devihosur school for ten months, is not enough. A separate vernacular agricultural training college is a need.

With one vernacular agricultural school of the type at Devihosur for each district and a vernacular training college for each district and a vernacular training college for each linguistic division for training teachers to the agricultural bias schools, I hope we can show considerable progress.

My replies to specific questions are:—

(i) Supply of teachers to vernacular agricultural schools to be limited to one at present for each district is sufficient; but for agricultural bias schools—we must train a number of teachers by specially starting a training college for each linguistic division.

(ii) No remarks.

(iii) Yes; the teachers in the rural areas should be drawn from the agricultural classes. They are more practical and may prove more successful with the training given to them.

(iv) The attendance both in the vernacular agricultural school at Devihosur and the bias schools is good.

(v) No remarks.

(vi) Yes; the pupils in those two kinds of schools are mainly drawn from the agricultural classes.

(vii) No; not at present.

(viii) Nature study is rather very much neglected and we should have it in all the primary schools. Natural liking for field work is the main incentive. The gift of the produce raised by them to the students should also be a good incentive. In agricultural bias schools we have one acre schoolplots and these are enough. We have a regular farm attached to the vernacular school and it is necessary.

(ix) Majority of the students who have passed out from the vernacular agricultural school at Devihosur have gone back to their fields and have created good impressions on the minds of their parents and the surrounding cultivators. The students from agricultural bias schools have not yet gone out.

(x) No remarks.

(xi) The students trained in Devihosur school are given facilities to be trained further on Government farms in special subjects.

(xii) Night-schools with the aid of the magic lanterns and temporary slack season classes are likely to popularise adult education in rural tracts. I have no actual experience however in the matter.

(xiii) I have only one suggestion to make. The funds available for education must in greater proportion be devoted to agricultural bias schools and the training of teachers for such schools. These agricultural bias schools are now in the hands of the Local Boards and I suggest that Government in giving grant to primary education should show some preference to these schools.

QUESTION 3.—DEMONSTRATIONS AND PROPAGANDA.—(a) Successful measures for influencing and improving the practice of cultivators are:—

- (1) Good social and practical demonstrators who can easily win the confidence of the cultivators and can work and live with them when needed. They should be carefully selected for the purpose and trained to do their work.
- (2) Selection of progressive farmers in the country for demonstrating agricultural improvements on their farms and continuous touch with them.
- (3) Good advertisement of the demonstrations especially through the leading cultivators whose confidence the demonstrators have won.
- (4) Creation of sympathy with the Revenue Officers to lead or send parties of cultivators to the demonstrations, if the Revenue authorities take interest in agricultural propaganda the progress will be more rapid.
- (5) Arrangements for light refreshments at the time of demonstration with the aid of local subscriptions and Government grant to a certain extent.
- (6) Organisation of finance where needed for introducing the improvements suggested.

It is not enough in many cases if we simply explain and demonstrate that a certain thing is good. It may not be within the easy reach of the individual cultivator and we shall have to work for co-operation in the village and often times seek for outside help from the Bank. A propaganda man ought to be the economical student of the tract and a good organiser too.

(b) Model demonstration fields of cultivators in different tracts with all agricultural improvements effected by the Agricultural Department to be seen and with simple farm accounts kept there will, I think, be more effective. This requires some Government subsidy to start with.

(c) To induce cultivators to adopt expert advice, intensive propaganda is what is needed. The agency of the Agricultural Department is too small to carry it. Sound local unofficial organisations must fill in the gap with Government subsidies. Taluka Development Associations planned by Sir Chunilal V. Mehta are being established for the purpose. Many such associations formed have good programmes of work before them, and they are keen on executing them. Want of funds and dearth of trained field-men are the two short-comings at present and it is hoped that we shall be able to overcome them soon. Under the existing rules of the Taluka Development Association, the cultivators of a Taluka are required to raise annually an amount of subscription equal to that to be given by the Government not exceeding Rs. 1,000. It is difficult to raise voluntary subscriptions for propaganda work every year. A few Local Boards are now coming forth with the aid, I feel it necessary, however, to raise permanent funds in years of good harvest which will yield an interest of Rs. 1,000. The idea

is appreciated by cultivators in many talukas and they are willing to give their subscription at the time of assessment in good years. The question of collecting these subscriptions by the village officers have engaged our attention. In Haveri taluka of the Dharwar district a sum of Rs. 10,000 has been collected through the help of an enthusiastic *mamlatdar* in one year and further collections are still in progress. Three other talukas are also attempting in this direction. The burden of subscription on the cultivators under this method is very light and the system needs encouragement from the revenue authorities. As regards good fieldmen for such associations, I feel, selection of candidates and periodical training classes ought to remove our difficulty.

(d) Success or failure of demonstrations and propaganda depends on:—

- (1) A thorough study of the need of a particular item of demonstration in different localities. A thing which is successful in one locality may not be so in another. I will illustrate this by an instance. The Nahan sugarcane crushing mill gives more extraction than Poona mill, but being smaller the output is less. It was successfully demonstrated in the Mallad tract of my division where bullocks are small and the extraction of juice and the method of *gul* making is slow. The cane growers boil only 3,000 to 4,000 lbs. of juice a day. The Nahan mill gives more extraction and keeps pace with the slow method of *gul* making prevailing there. The advantages were clear and the mill soon became popular. It has now altogether ousted the Poona mill in that tract. In Chikodi taluka, however, the demonstration of Nahan mill was unsuccessful. The cane growers of this tract boil their juice more quickly usually 9,000 lbs., a day and the Nahan mill though it gives more extraction, cannot keep pace with quick boiling. Under the system of labour prevailing there for *gul* making, the gain by extraction from the Nahan mill is not commensurate with loss in the form of labour. The detailed study of the local methods, therefore, is essential before a thing is demonstrated.
- (2) Arrangement and advertisement of the demonstration, I know, in many a case where attention was not paid to this, the demonstrations were unsuccessful.
- (3) Continuity of demonstration and propaganda. This is essential. Hurried short-time demonstrations have not been successful. If the things demonstrated are removed soon and are not shown until they are fully appreciated, there will be no progress.
- (4) Certain items of demonstration and propaganda need co-operative organisation in villages. If this is not done, the propaganda is not successful. Fencing fields with stone-wall or woven fence against wild pigs is an instance.

It does not pay individual cultivators to fence their areas except for sugarcane cultivator, while it does very well to fence large areas even for ordinary crops. Village co-operation has played a very important part on this propaganda in the Southern Division, and we have now 30 miles wall erected to protect an area of about 11,000 acres. The cost of fencing per head is very small when compared with advantages derived from it. The extension of the propaganda on this item of agricultural improvement has large scope; but it depends entirely on co-operative organisation.

QUESTION 5.—FINANCE.—(a) In the dry tract finance for ordinary annual agricultural operations is not much needed. For land improvement, however, in the form of field embankments, removal of deep rooted weeds like *hariali* (*cyperus rotundus*), well sinking, etc., it is very much needed. Short-term credit should be very limited so that it will not be misutilised. The co-operative credit societies which are working in the interest of the

cultivator should be very particular about this point. Long-term credit should be arranged by Government *taccavi* loans.

(b) *Taccavi* loans should be given from time to time after due inspection of the works and not at once into the hands of the cultivators. In the case of field embankment where some expert advice is also needed, it is better to organise a scheme of work through the agricultural departmental agency. The *bunding* officer with a set of workers under him can prepare plans and inspect works at the same time and see whether they are executed according to the plans prepared. This will not only mean fuller use of the *taccavi* loans issued to the cultivators but also mean better kind of work in the fields which ensures safe repayments. Funds available may be allotted to different Divisions of the Presidency and drawn from Local Government Treasury from time to time by the applicants on the recommendation of the experts in charge of those works. At the suggestion of the Honourable Sir C. V. Mehta I have submitted a scheme to the Director on this line on field embankment work in the Southern Division which is under consideration.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) The main causes of borrowing are:—

- (i) Poor harvest of crops owing to want of rains.
- (ii) High competitive rental values of lands followed by sudden fall in prices of cotton.
- (iii) Expenditure beyond means especially for marriages.
- (iv) Litigation.

The causes mentioned in (1) above are also the reasons preventing repayment. Taking a series of years farming in the dry tract means mere maintenance to the tenant holders. The majority of the cultivators own small areas of their own and take the rest on lease sufficient for cultivation by a pair of bullocks. My general observations are that peasant proprietor who owns sufficient area for a pair of bullocks or more and cultivates it himself is a progressive farmer. In the case of tenant holders the margin of profits in agriculture is so small that he easily runs into a debt in bad years and once he incurs debt it is very difficult for him to extricate himself from it. The usurious rate of interest charged by the *sowcar* makes matters worse. The debt increases and he will have to sell the piece of land that he owns and turn into a labourer. I have also observed that litigation and expenditure beyond means for marriages will run many cultivators into debt. The cultivator is not generally willing to sell his land until he is forced to do it. He is therefore always to be found in debt.

(b) The application of the Usurious Loans Act may help cultivators to a certain extent. But the real remedy should lie in making agriculture more paying and this can only be done by reduction in the rental values of the land. The rental values depend more or less on the sale values of the land. I have observed that lands are being purchased by absentee landlords to a great extent. They earn money from other professions and invest it into lands at any cost. To discourage absentee landlordship either by law or by other means may go a long way to help the matter. Encouragement to the formation of either co-operative societies or joint-stock companies to establish local industries will also be able to help it.

(c) I have already explained elsewhere that the land-owning cultivator is not inclined to sell his land unless he is forced to do it. The question of limiting the right of sale therefore is not very important. Limiting the right of mortgage however may help him. For current expenses cultivator should not be allowed to incur a debt exceeding one-fifth of the market value of the land he possesses. Loans for more than this amount should be only for land improvement; but they should be long-term loans.

Either the Government or credit societies or the moneylender should be interested in seeing that improvement for which loans are issued are effected. I have only placed some of my views on the subject but the question of legalising the measures needs more detailed consideration.

QUESTION 8.—IRRIGATION.—(a) (i) In the districts of Dharwar, Belgaum and Bijapur there seems to be scope for extension of canals by *bunding* rivers and *nallas*. The scope for extension of non-perennial canals by *bunding* *nallas* seems to be more. A good survey is what is needed.

(ii) In the Malnad taluka of Dharwar and Belgaum districts there is large scope for extension of tanks and ponds. Good many of the existing tanks also need repairs and improvements. They are silted up and do not hold so much water as they used to do. Paddy crop of this tract mainly depends upon these tanks and all possible efforts to improve the existing tanks and to increase the number, will be greatly appreciated by the cultivators of this tract. There is more scope for extension of economic wells in the transition tract than either in Malnad above referred to or in Yerinaid where deep black cotton soil prevails.

In case of *bunding* up *nallas* and construction of communal tanks, State aid and co-operation should play their part. No private individual or company has yet undertaken any irrigation schemes. I suggest that the State should take up as many schemes as possible and should in other cases encourage formation of co-operative irrigation societies by granting long-term *taccavi* loans usually 25 years but extending to 40 in deserving cases. In case of wells and individual ponds too, long-term *taccavi* loans are what are needed.

QUESTION 9.—SOILS.—(a) (iii) For the prevention of the erosion of the surface soil by flood water, field embankments on contour lines are what are needed. In the Southern Division we have a special officer appointed to prepare schemes for the applicants. The departmental services to the cultivators in this respect have been much appreciated and the demand for advice is much increasing especially in the Bijapur district where rainfall is scanty but in a few heavy showers. Much of the rain that falls rolls down and is not only lost to the cultivator, but it takes along with it silt from the surface soil and forms *gullies* and *nallas* as it runs. In tracts of dry farming the land forms the major part of the capital and if it is not well protected against washings, a rapid deterioration sets in. If the small *nallas* are not protected by effective bunds, they soon grow wider and deeper especially in the black cotton soil and their beds become unfit for cultivation. The cultivators who neglect or fail to remedy them in time, soon find themselves in despair. (Walking along the slopes of extensive black cotton soil tract in the Southern Division, one can easily observe the damage done by these *gullies* on a number of holdings owned in particular by the absentee landlords.) A general survey of the tract cannot but reveal the paramount need of field embankments on an extensive scale. To carry on this work, extended technical advice and long-term loans are what are needed.

(c) In the Malnad talukas of the Dharwar and Belgaum districts, a good deal of cultivable land has gone out of cultivation owing to the attack from wild pigs and prevalence of malaria. On close study of the problem I feel that the reason for depopulation here is mainly the attack from the wild pigs. Malaria did exist as it does at present; but due to the increased attack from wild pigs, the cultivator is required to watch his crops at night time and in so doing he has lost health and has no stamina to stand malaria or any other disease. (With the decreasing population and the increased attack of the pigs, many lands, especially near the forests, have gone out of cultivation and the people have forfeited their fields. Protection against the pigs will greatly help to solve the problem.) To quote an instance the Hulihond village with 351 acres of land was fenced in 1924 with a stone wall, at the time of fencing only 90 acres of land was

under cultivation. After fencing almost all the cultivable land uncultivated (236 acres) has been brought under cultivation with great benefits.

QUESTION 10.—FERTILISERS.—(a) In irrigated tract I feel great use of both the natural manures and artificial fertilisers could be profitably made; but in the dry tract, I think, only natural manures have a large scope. Artificial fertilisers have not been of much use. Improvement is possible in the following directions:—

- (i) Better preservation of farm yard manure which is the commonest natural manure.
- (ii) Green manuring in the irrigated fields and in the transition tract where early monsoon rainfall is sufficient. In Chikodi taluka of the Belgaum district *sann* green manuring is a general practice in dry farming, where the rainfall is 32" and where *juar*, gram after *sann* green manuring and tobacco are rotated.
- (iii) In many villages prickly pear is found in abundance in waste lands and there seems to be some scope for turning this product into a natural manure.
- (iv) Ammonium sulphate has been found to be a very useful top dressing artificial manure for sugarcane, bonemeal to a paddy crop, and cake manure to paddy and sugarcane crops, other artificial manures are yet under trial.

(b) Giving licenses to dealers and inspection of the stuff they stock is one of the measures. The second would be to allow free trade but make dealers subject to a penalty in cases of fraudulent adulteration. This measure also needs occasional inspection and the analysis of the stuff they stock.

(c) Field demonstrations through the District Staff of the Agricultural Department and through the Taluka Development Associations would be the proper methods to popularise new and improved fertilisers and they have been so in the past. The manufacturers and the dealers should, I think, give new fertilisers for trial free of cost for some time.

(d) I have observed the use of the following manures to a considerable extent in recent years in places shown against them:—

Ammonium sulphate and cake manure	Chikodi and Hukeri talukas and in Gokak canal tract in the Belgaum district.
Bonemeal	Khanapur taluka of the Belgaum district.
Natural farm yard manure	All over the transition and the Malnad tract, especially at and round Hulkoti in Gadag taluka of the Dharwar district.
<i>Sann</i> green manuring	Chikodi taluka of the Belgaum district.

(e) Various artificial manures were tried on the Dharwar farm to dry crops like *juar*, wheat, and cotton and they have not been found to be paying in the past. On Gokak irrigated farm a mixture of cake and ammonium sulphate has been found to be the best.

(f) The relative importance of cowdung as a manure is being understood by the cultivators; but it is a question of the substitute of a cheap fuel in its place. In the Malnad adjoining the forest lands, wood can be had very cheap. (In the transition tract the existing supply of the cotton stalks seems to be insufficient and needs supplementing.) The cost of jungle wood from forest areas becomes prohibitive due to the transit expenses. Railway concession to *bona fide* agriculturists through Taluka Development Associations may help to solve the problem to a certain extent.

QUESTION 11.—CROPS.—(a) (i) Cotton, *juar*, wheat, paddy and tobacco are the main crops of the Southern Division. Plant-breeding work is in progress at Dharwar on cotton, *juar* and rice. In cotton, we have two varieties Kumpta and Dharwar American. In both these varieties, we have two strains selected, called selected Kumpta or Dharwar No. 1 and upland or Gadag No. 1. Each of these two strains has covered an area of about two lakhs acres (one lakh from pedigree seed and one lakh from the market seed). The estimated extra profits derived by growing Dharwar No. 1 and Gadag No. 1 cottons are Rs. 5 and Rs. 7 per acre respectively. Attempts to cover the whole cotton area with selected strains and schemes for multiplication of the pedigree seed are being contemplated. Selection in principal varieties of *juar* and rice which are the staple food crops of the division is in progress. We have just given out some selected strains and they are yet to be tested on field scale. Similar work on wheat and tobacco is necessary.

(ii) Ground-nut (Spanish pea-nut variety) is a most paying crop that has been introduced on the red and reddish black soils of the transition tract in the Southern Division. Its cultivation is extending. The crop was introduced in 1917-18 and in 1924-25 the area under this crop has been 11,416 acres in Dharwar district alone. It competes well with cotton under its present prices. On *mal* lands (poor red soils) the benefit derived by cultivators has been immense. Ground-nut is grown in place of inferior millets on these lands. Growing crops specially for the fodder has not been taken to and is not likely to be adopted for the cultivators except in the irrigated tract of the taluka of Chikodi.

(iii) Good improved cotton seed is the only seed which demands organised distribution on a large scale. (In other crops cultivators keep their own good seed to a great extent.) Seed cotton generally comes to the market centres for sale where it is ginned. The seed in these gins gets mixed and will be inferior in quality. In the case of our selected strains we sell certain number of flowers every year and multiply the seed in the second generation on one acre and in the third generation on thirty acres under strict control on the Government farm, we distribute the seed in the fourth generation to seed growers in a block of 600 to 800 acres and in the fifth generation in a block of 5,000 acres. The produce of this is sold through the Sale Societies, ginned separately and the seeds stocked in these societies for general distribution in the sixth generation. Produce from the crop of this sixth generation is not taken back for seed purposes. This organisation of seed multiplication is to prevent deterioration by natural crossing and by accidental mixture. The Sale Societies open their depôts and distribute the general seed. The method has been appreciated by cultivators.

(iv) Pig and deer are the only wild animals which damage the crops to a great extent in the Southern Division (pigs in the western paddy tract and deer in the eastern dry cotton tract). I have dealt with fencing against pigs in my answer to the question 9.

(c) Organisation of hunting parties is also considered to be a remedy and is under contemplation at Dharwar.

QUESTION 12.—CULTIVATION.—(i) The iron plough has now come to be used instead of the wooden one, and does better preliminary tillage. Owing to want of good bullocks some cultivators have not yet taken to its use. Demonstration of motor tractor is attracting the attention of the cultivators and seems to have scope for improvement in the existing system of tillage. The disc harrow for sugarcane cultivation is also useful.

(ii) The system of growing ground-nut and cotton in rows has been successful in Haveri taluka. Maize with *tur* as a row-crop has succeeded in the Gokak canal tract in place of maize after maize. *Juar* after lucerne and ground-nut is better than *juar* after cotton. Considering from many points of view a three-year rotation wheat, *juar*, cotton or ground-nut, *juar*, cotton is better than two-year rotation *juar*-cotton.

QUESTION 14.—**IMPLEMENTS.**—(b) A network of demonstrations preferably through Taluka Development Associations and facilities for getting improved implements on hire are what are needed to hasten their adoption by the cultivators. The Taluka Development Associations should better keep them both for sale and on hire to start with. When the demand increases they may start special co-operative agricultural requisite societies for the purpose.

(c) The two manufacturers of iron ploughs, namely, Messrs. Kirloskar Brothers and Khan Bahadur Cooper, manufacture iron ploughs on a large scale. They have been doing their own propaganda to a certain extent in carrying out their sales. I suggest that they should better deal through the Taluka Development Associations where they exist. They will undertake to demonstrate their implements and act as their agents.

QUESTION 17.—**AGRICULTURAL INDUSTRIES.**—(a) In the Malnad tract an average cultivator works on his field about two hundred days in a year, in Gadinad 240 days, and in Yerinad 150 days. The Malnad cultivator generally goes to forest work either for cutting or carting wood. In Gadinad and Yerinad the cultivators round cities and railway stations generally engage themselves with their bullocks in carting goods; but in the interior the slack season is much wasted.

(b) Spinning and weaving ought to form the general bye-industry in the country. Rural weaving classes seem to be the right aid to be given by the Government. I know a school is working at Ibrahimpur in the taluka of Navalgund, district Dharwar, a dry tract subject to famine where much of the spare time is wasted. Out of 9 students trained for the last four months, 7 have already purchased fly shuttle looms. Many of the villagers have promised to learn weaving and are very anxious that the school should be continued there until the demand is fully met. I give this only as an instance to show the possibilities of hand-weaving if a right sort of propaganda is done on it. Most of the cloth worn by the cultivators is coarse which they can prepare themselves. Organisation of the sale of the surplus produce, however, is a matter of much importance and should be arranged. The other possible bye-industry on a large scale is poultry breeding especially among the non-vegetarian cultivators. This seems to be a very hopeful bye-industry, but caste prejudices seem to come in the way. It needs encouragement, however, among the people who are willing to take to it.

Fruit growing needs irrigation facilities which do not generally exist in the dry tract. Hence this is not a possible bye-industry.

(Sericulture, I feel, requires cool climate and has a limited scope in the Southern Division.)

Pisciculture has also to meet caste prejudices.

Rope making is possible and is being done. It needs extension.

Basket making I feel, is a specialised subject and cannot be handled by the average cultivators.

(d) I think that the Government should give help in the form of technical advice in establishing these industries in rural areas and with long-term loans to co-operative societies if they are organised to establish such industries.

(e) Yes. The best method of encouraging industrial concerns in rural areas is to form co-operative societies by the producers of raw materials themselves.

(f) Yes. A more intensive study is needed, but before it is attempted the available information from the persons interested should be collected.

(g) Field embankment by the cultivators themselves at their spare time with small *taccavi* advances to meet their maintenance is likely to go a long way towards greater rural employment and ultimate greater production from the land.

(h) Propaganda and the organisation of local sanitary committee will induce the villagers to devote their spare time in improving the health condition of their environment.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) A propaganda to induce labourers of fair means to go and settle in areas where the cultivable land remains uncultivated is likely to succeed if the occupancy of these lands is given free to them under certain conditions and if co-operative farming societies are organised.

(b) There is shortage of agricultural labour only at the time of harvest, as the harvests of various crops in a tract come together. Change of crops under the existing conditions of the rainfall is not generally possible. Suitable harvesting and threshing machines are in demand by the cultivators; but they have not yet been found out.

QUESTION 22.—CO-OPERATION.—(b) I have the following observations to make upon:—

(i) Credit societies—many members who take loans do not use them for the purpose for which they take. The progress of the movement from the point of agricultural development is therefore not in any way marked, though in some other directions it has done exceedingly well. The Managing Committee of the society, the Inspector of the Bank and the Government Auditor should be very particular in making thorough enquiries about this point and it should be an essential point in audit classification of the societies.

(iii) Hubli and Gadag Cotton Sale Societies have done well in the Southern Division. Distribution of good pure seed of selected types of cotton, grading *kapas* and auction sales which bring better prices to the cultivators are the main causes of their success.

The Agricultural Department works with these Sale Societies in multiplying good pure seed and an Agricultural officer does grading work in each of these societies.

(iv) There seems to be a large scope for fencing societies in the western and for bunding societies in the eastern tracts of my division. Fence and field embankments have appealed more than anything else to the cultivators. Eight fencing schemes with stone walls have already been executed and about 30 miles walls have already been built to protect about 11,000 acres. A few schemes are complete enclosures, while others have walls only along the hills. I give below the details of two schemes (one complete enclosure the cost of which is the highest of all and the other with wall along the hills the cost of which is the least).

No.	Name of the village.	Area protected.	Total length of the wall.	Dimensions of the wall.			Total cost of construction.	Increase in cropped area.	Approximate extra profit per year.
				Ft.	Ft.	Ft.			
		Acres.	Miles.				Rs.	Acres.	Rs.
1	Hulihond	351	3.37	4½	3	1½	7,103	236	4,335
2	Dhunbad Kurnakop.	2,482	3.29	4½	3	1½	4,765	100	5,875

These figures may interest the Royal Commission. The cost in both cases is very little when compared with benefits derived. In the case of linear walls along the hills which cost less, the adjoining villages will have to carry on the wall and in fact applications to that effect are coming forth.

Extension of co-operative fencing is not as rapid as it ought to be owing to the following reasons:—

- (1) Cultivators of Malnad are poor and many of them are not in a position to pay one-eighth of the cost of fencing which they are required to collect before they can approach Government for *taccavi* loan. In most cases I have observed that cultivators borrow for this purpose.
- (2) Some obstinate absentee landlords refuse to join the scheme thinking that they would be benefited if others carry on the work. There will be considerable delay in inducing these recalcitrant owners and taking their signatures for consent. A few good schemes are pending for the last two years for this very reason and the part of the money collected has been deposited in the Banks.
- (vi) There seems to be scope for co-operative use of motor tractors, power cane-crushers and rice-hulling machines in the Southern Division and attempts are being made to start societies for the purpose.
- (viii) Cattle breeding societies are making fair progress in Hirekerur taluka of the Dharwar district. This taluka borders on Mysore territory and the cultivators have appreciated the value of Amrit Mahal bulls. Castration of mongrels in villages where societies have been started and prompt veterinary aid need more attention.
- (c) From my long personal experience in connection with formation of fencing societies I feel legislation to compel minority to join for the common benefit is badly needed. If 80 per cent. of the people consent, the other 20 per cent. should be compelled.
- (d) I feel fencing societies, sale societies and cattle-breeding societies have in the main achieved their object.

QUESTION 23.—GENERAL EDUCATION.—(a) The existing system of general education has not in any way improved agricultural efficiency of the people; but on the contrary it has acted adversely on it. The educated man dislikes manual field work and does not think about the agricultural development of his own lands and far less about his village or tract. As a demonstrator and propagandist, I am required to meet local educated people of the country who possess the lands and I have not received any appreciable response from them with a few honourable exceptions. They silently direct the agricultural demonstrator to their ryots and state that they do not know anything about the subject which we wish to interest them in. These educated landowners are however leaders of rural areas and the demonstrator is required to work through them in many cases. It is really a difficult task to do it. If the educated leading landowners possess fair agricultural knowledge and take interest in the subject the progress, I am sure, will be more rapid. I have a few suggestions to make:—

- (1) Elementary school education in rural areas should have agricultural bias from the fifth standard and the schools should have their long usual vacations at the time of harvest instead of at any other time.
- (2) Agriculture should be a compulsory subject in middle and high schools and text-books prescribed for various classes.
- (3) Agriculture and rural economics should be an optional subject in all the Arts Colleges.

This will mean that majority of the educated men will be interested in agriculture and begin to think about its development. Many of the students who go to Agricultural College at present have very little grounding in the subject of agriculture and the knowledge and practice they get in three years is also very limited. Some students do come from the agricultural classes but they too have no touch with the subject in high schools.

The students that pass out from the Agricultural College are after all very limited in number and form a small minority among the educated men of the country.

(b) (iii) In the rural areas of the Southern Division many of the primary schools are only up to the third standard. Full primary schools are for a group of villages. The cultivators are not inclined to send their small children from villages to villages and it is mainly for this reason that the proportion of the boys who pass through the fourth class is smaller. The second reason is that cultivators depend upon their children for field work from the very tenth year of their age. A taste for education is being created however in rural areas and a right sort of education with agricultural bias is really what is needed.

QUESTION 24.—ATTRACTING CAPITAL.—(a) As far as I now observe, men of capital and enterprise do not generally possess the necessary interest and knowledge in agriculture. If they take to it without the requisite knowledge, they will have to depend entirely on the servants and I am afraid they are likely to fail. Agriculture requires strong technical personal supervision if it is to be conducted through servants. Our elders in rural areas did it but their sons with the present education have abandoned it. I know many families which were once engaged in agriculture have now leased out their lands. General education with agricultural bias discussed in question 23 will, I think, solve the situation.

(b) Absentee landownership and annual rental system instead of long term leases are the main factors tending to discourage land improvement. Some of the landlords have not even seen their lands and are letting them out through their clerks or some middle men.)

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) Good drinking water-supply both for men and cattle is a need in many villages and deserves attention. There are many other items which need similar attention but where is the money? Poverty is dominant and it is mainly the result of ignorance.

Village school ought to be the centre for enlightenment in rural areas and it must be a right kind of school. This school should in fact be a reference to the villagers for the solution of almost all their difficulties in the form of advice.

(b) I am in favour of Government conducting economic surveys in typical villages through experts who should work with the local committees. The committees with these experts should consider and draft the method of enquiry suited to different tracts and subject it to the public criticism before any actual enquiry is undertaken.

(c) My intensive statistic study in two villages is still in progress but from my intimate knowledge of the people and their problems in the rural areas of the Southern Division I have the following observations to make:—

In the western paddy tract, protection against wild pig, co-operative rice-hulling machines, co-operative tank irrigation schemes and good drinking water-supply will improve the condition of ryots a good deal. In the eastern dry tract, field embankments, co-operative cotton ginning and oil pressing industries and weaving as a cottage industry will do the same.

To add to this free and compulsory education with agricultural bias in rural areas is likely to hasten the rural development. Organisation of funds for all these purposes should engage the attention of all the sympathetic leaders of the country.

Oral Evidence.

6598. *The Chairman:* Mr. Salimath, you are Deputy Director of Agriculture in the Southern Division, at Dharwar?—Yes.

6599. You have prepared for the Commission a very interesting note of the evidence which you wish to lay before us, and we are very much obliged to you. Would you like to proceed at once to question and answer, or have you anything in general to say?—I have no general statement to make.

6600. There are just one or two points that I should like to clear up. Your statement is very complete, and conveys your meaning with great clarity. Would you turn to page 371? What is your experience of the efficiency of Local Boards as bodies responsible for education?—I am sorry I have not got much touch with the Local Boards.

6601. Have you any views as to their efficiency as directing agents for education?—The members come from rural areas, and of course they have got some influence in the tract. They can influence the rural areas towards these bias schools.

6602. I see that on page 373, amongst the reasons for agricultural indebtedness, you give the uncertainties of the monsoon season first place as one of the reasons for agricultural indebtedness?—Yes.

6603. Would you turn to page 374? I see there that you link the damage by wild pigs in a particular district with the incidence of malaria in a very interesting way. I take it your view is that the night watching, which is necessary in an area where damage by wild pig is very prevalent, exposes the villagers to infection by malaria?—Yes, I hold that opinion; it makes them more susceptible.

6604. The effect of these two factors in the particular district has been to bring about a considerable measure of depopulation, has it not?—Yes.

6605. Then you give a very interesting example of the extent to which fencing is capable of mitigating this evil?—Yes.

6606. Do you think the desire to fence land is spreading; do you think the cultivators are paying more attention to the possibilities of protection by enclosure?—It is spreading very much.

6607. What has turned your mind towards the possibility of utilising prickly pear as manure?—It grows on a very large scale in almost all villages, just in the village sites. To convert it into manure it is cut and put into a pit; but it does not rot well, and we shall have to find out how to make it rot quickly and then apply it.

6608. It is very tough and does not rot very easily?—No.

6609. Have you ever come across any indigenous practice of this sort? Have you ever known cases where the villagers have done it?—I know in two instances the people attempted to turn cactus and prickly pear into manure.

6610. What happened?—They got an advantage to a certain extent; they had to rot it for two years, after burning it.

6611. Burning in order to remove the prickles, is that it?—Yes.

6612. Why is it necessary to remove the prickles in the case of manure?—Otherwise, the prickles will remain as they are, and in the fields they will inconvenience the cultivators.

6613. So that what they do is to singe it, just as they do before pulverising it for fodder in the fodder famine period?—Yes.

6614. The prickles were removed and the spineless leaves put into the pit and left there for two years?—Yes.

6615. Was any cowdung or other agent put in with it?—No.

6616. On page 377 you give figures as to the average periods of annual unemployment of the cultivators?—Yes.

6617. How did you arrive at those figures?—By taking each tract separately, and enquiring of the cultivators. Of course, I have done it twice in different areas, taking the days month by month and aggregating the whole during the year.

6618. How do you account for the extraordinary difference between district and district?—In the Malnad tract, generally they take two crops; that is why they work more than in the eastern dry tract, where of course they take only the *rabi* crop. Similarly, in the transition tract the working days are more.

6619. Do you say that the figures that you have given are accurate?—So far as I could make them, because I have actually worked them out.

6620. You think they are reasonably accurate?—Fairly reasonably so.

6621. Is co-operation making any headway in the district with which you are familiar?—In connection with fencing and in connection with cotton sale it is progressing in the Southern Division.

6622. Is it very difficult to organise villagers on a co-operative basis for the purpose of enclosing crop land and fencing?—We experience some difficulty. Especially, some of the absentee landlords are not willing to help and then the schemes take a very long time; of course, that is one of our difficulties.

6623. I suppose there is no objection other than the cost; that is the only reason why an individual stands out of these schemes; they do not want to pay?—It is not only the cost. Some of the absentee landlords do not come in, though the cost is fairly low. As I have shown in the second instance, the cost per acre has not exceeded Rs. 2, where one wall along the hills is built up. In that case, too, we had to wait for a very long time before we could complete the scheme.

6624. Is there any objection, other than the cost, put forward by particular landlords or cultivators? There is no other objection to fencing; is there?—Generally the cultivators are required to pay one-eighth of the capital required for fencing, according to the co-operative rules. I have invariably observed that they borrow for that purpose. That is also one of the difficulties.

6625. Do you think that, where the majority of owners are in favour of fencing, the scheme should be carried out in spite of the opposition of a small minority?—The majority of them are willing and anxious to extend it.

6626. But of course, if you have two owners who are anxious to carry out fencing, and between the holdings of those two owners there is someone who objects to fencing, that immensely increases the total cost of fencing the properties of the first two men, in that each would have to have a separate fence for his own property?—Yes.

6627. For that reason do you think that where the majority favour enclosure, a small objecting minority should be compelled to conform to the scheme?—I think so. I am emphatic on that.

6628. *The Raja of Parlakimedi*: You suggest on page 370 that agricultural schools should be encouraged. Do you mean that the medium of instruction should be the vernacular?—Yes, the vernacular.

6629. Have you got a sufficient number of books translated?—There is a dearth of books at present.

6630. How do you propose to meet the difficulty?—I think some of the people in the different Divisions will have to write books; that is the only remedy.

6631. What would you suggest as regards the financing of the translations?—If encouragement is given to some people, if prizes are given, I think people will be coming forward to write books in the vernacular.

6632. Do you mean that prizes should be given by the department?—By the department.

6633. I think you imply that management under the Local Boards has not been very successful. Do you not think that it may be handed over to these Development Associations?—I am of opinion that members coming from local areas have not yet taken enough interest in starting these agricultural bias schools. If Government gave some grant it would go a long way.

6634. *Sir Chunilal Mehta*: In answer to the Chairman you were talking about the objection of certain absentee landlords to coming into co-operative fencing schemes. Have you also found that some landlords are obstructive, that they think the scheme cannot be carried out without their assistance and they stand out. You notice that?—I have noticed it but to a very small extent.

6635. Would you advocate legislation to compel such people to come into the scheme?—Yes.

6636. That is the proposal which is before the Government now. Are you aware of any proposal being made by the Registrar of Co-operative Societies to Government on that matter?—Yes.

6637. Would you mind telling the Commission your experience of *tals*? Mr. Lowsley deals with *tals* on a big scale. Do you deal with *tals* of individual cultivators?—We deal with individual cultivators on a small scale not exceeding Rs. 5,000. We deal only with embankment schemes not costing more than Rs. 5,000.

6638. Have you carried out any such schemes?—We have in fact carried out 120 schemes during the past season.

6639. Have you any idea of what it costs?—We have divided our field embankments into three classes. In the first class we have the big *tals* where water comes from an area exceeding 400 acres, in the second class from 100 to 400, and in the third class ordinary field embankments where the slope is not heavy and the catchment area is within 100 acres. We have not systematised the work of estimating the extra profit for the fields we have bunded, but from my enquiries from the cultivators on the spot we have arrived at some figures which may be taken as fairly correct. In the first class of schemes we are getting 20 per cent. on the capital which we lay down; in the second 15 per cent., and in the third not more than 9.

6640. How are these schemes financed?—I think up till last year we took only schemes of individual cultivators who were willing to pay from their own pockets. Recently in Bijapur, Government advanced a fairly large amount of *taccavi* where we are working with the Collector.

6641. Have you got the figures of any of the schemes you have carried out?—I am sorry I have not brought them. If you want it I will supply figures for a few of the schemes in each of the classes I have mentioned.

6642. Would you mind supplying the actual figures?—I will do so.

6643. Is there a big scope for this class of work in the districts with which you are acquainted?—Enormous, especially in the eastern tract where the rainfall is less than 18 inches.

6644. Even there you think that these *tals* would lead to better outturn?—Certainly.

6645. On page 377 you talk of weaving as a possible spare time occupation?—Yes.

6646. These figures that you have collected are actual instances?—Actual instances.

6647. Do you find any disposition amongst cultivators to take to weaving?—In certain tracts, yes.

6648. Have you found any caste difficulties preventing cultivators taking to weaving?—Not so far as I have observed.

6649. Are there professional weavers by caste known as *Koshtis*. I think there are agricultural classes who have taken to weaving?—They have been weavers for a long time.

6650. What kind of cloth do they produce?—Ordinary village cloth: *dhoties, panchas*, and of course shirting.

6651. Coarse cloth which they use for themselves?—Yes, and *saris*.

6652. Is there any organisation for the marketing of these products?—Weavers take their own products to the nearest town and sell them there; there is no co-operative organisation.

6653. Where do they get their yarn from?—In the market.

6654. Do they use mill yarn or hand-spun yarn?—Mill yarn.

6655. Is there any organisation for the supply of mill yarn to them?—No.

6656. They get it from the moneylenders?—Yes.

6657. And the moneylender charges any price he likes and supplies any indifferent quality yarn?—To a certain extent he does.

6658. You think therefore there is scope for improvement in this industry?—I think so.

6659. *The Raja of Parlakimedi*: Do you think that the Taluka Development Agency would be a better agency than the District Boards to look after the agricultural bias schools?—I think so.

6660. You think that these grants should not directly go to the teachers of the bias schools but should go through the Taluka Development Bodies?—I am of opinion that they should.

6661. You suggest that prickly pear may be used as green manure?—It is not a green manure crop.

6662. Where can it be got from?—It can be got from the village site; it should be put into a pit, allowed to rot and then applied to the fields. It cannot be applied as green manure because it is grown on the village sites.

6663. You said that it was tried somewhere as green manure?—Not as green manure. It was cut, burnt, put into a pit, allowed to rot for two years and then applied to the fields.

6664. What is the particular crop for which this was used?—For *juar* in that particular year. (We do not generally manure cotton; we manure *juar*.)

6665. Did it give better results than cowdung manure?—No, it did not. It gave some manurial effect; I mean it was better than no manure, but no better than farmyard manure quantity for quantity. I have been wondering whether it would give better results if it were more thoroughly rotted and mixed with lime and ammonium sulphate. We have tried that this year.

6666. With reference to page 372, do you not think that these cultivators and landowners should be encouraged to take interest in these schools? You say: "As regards good fieldmen for such associations, I feel, selection of candidates and periodical training classes ought to remove our difficulty." Do you not think that landowners also might be encouraged to attend these periodical training classes?—I have not differentiated cultivators from landowners. Landowners who have done work in the fields will be better.

6667. The man who cultivates his land and is interested in it?—Yes.

6668. You would not mind including a landowner of that sort?—No.

6669. *Sir James MacKenna*: Who carried out those experiments with prickly pear to which you referred?—The Agricultural Overseer in Gadag.

6670. Has the Agricultural Department worked out the manurial value of this rotted prickly pear or is it just a shot in the dark?—In my division it has not been done.

6671. Do you not think that would be a good preliminary before you begin recommending it?—We are not recommending it. A cultivator out of his own curiosity did it. We have not done any propaganda.

6672. For how many years have you been the Deputy Director of Agriculture?—For the last four years.

6673. Do you come from the cultivating class yourself?—Yes.

6674. Was your father a farmer?—Yes.

6675. Did you work on the land as a young man?—I did.

6676. Where were you trained?—I was trained in the Poona Agricultural College.

6677. Have you any agricultural stations in your district?—There is one at Dharwar and another at Gokak.

6678. Do you live on one of those farms?—No, I am living in the city of Dharwar.

6679. Do you carry out any research work yourself?—No, not myself.

6680. Not as Deputy Director?—No.

6681. *Professor Gangulee*: On page 370 you say: "A separate vernacular agricultural training college is a need." Is it possible to eliminate English in an agricultural training college?—This would be of the type of vernacular college which existed formerly without English.

6682. Where?—In different linguistic divisions, for the training of teachers for ordinary schools.

6683. Under the head of Administration and Propaganda you make a number of suggestions. Have you yourself as Deputy Director tried to give effect to any of them?—I have.

6684. Would you definitely state a particular instance and tell us what was the result?—I have given effect to almost all these that are suggested. Perhaps you will kindly refer to a particular item.

6685. For instance, have you created sympathy with the Revenue Officers?—I have done so.

6686. Have you made arrangements for light refreshments at the time of demonstration?—Yes. It is the usual system; I am very particular about it.

6687. On page 374 you say there is a large scope for the construction of communal tanks. What do you mean by "communal tanks"?—Irrigation tanks.

6688. Run on a communal basis?—Yes, by groups of cultivators.

6689. Not one tank for the Mahommedans, one for the Hindus, and so on?—I do not mean that.

6690. *Mr. Calvert*: As regards fencing, I see the tariff on wire netting is 15 per cent. Is that an obstacle to the further progress of your fencers?—I think so.

6691. It is so high?—Yes.

6692. Do you think the abolition of this tariff on wire fencing might make your work easier?—I think so.

6693. Have you carried out economic enquiries in the villages?—Yes.

6694. Have you examined the question of mortgages?—Not yet.

6695. *Mr. Komat*: You say you are carrying on intensive statistical study in two places in your district?—Yes.

6696. Your inquiry is not complete and you are not able to give any definite conclusions at this stage?—Yes.

6697. But from your intimate knowledge of the people can you give me an interim conclusion as to one or two things. Is the productivity of the land per acre going up in certain tracts, to your knowledge, owing to the new methods?—You mean with improved methods?

6698. With the help of the modern improvements which you adumbrate, have you reason to believe that the land is producing more per acre than it did before?—Certainly, it is in cases where they have taken to improvements.

6699. That is your impression?—Yes.
6700. After taking into consideration the price and the value of the produce, the margin of profit to the cultivator is also going up?—I think so.
6701. You have reason to believe that?—Yes.
6702. And the standard of living of the cultivators in the Southern Division is also rising?—Not as a whole.
6703. Only in those places where they have taken to your improvements?—Yes.
6704. You think it is necessary and desirable that the Deputy Directors of Agriculture should have, as a rule, knowledge of rural economics and should be interested in the welfare of the villages?—Certainly.
6705. They should not merely confine themselves to the propaganda of the mechanical agricultural improvements which the department wants them to spread?—I quite agree.
6706. Are most of the Deputy Directors adopting that view, that they must interest themselves in the profits and losses and economics of the villages?—I think they are doing so.
6707. Do they also take an interest in rural reconstruction in their capacity as Deputy Directors or do they think it is not part of their official duty?—I do not think they hold that view.
6708. They do not neglect that side of the question?—They do take a certain interest in the matter, but it is only a question of the volume of work they put in.
6709. They have no special interest in the problem yet?—To my knowledge some have done that work.
6710. Some do take an interest?—Yes.
6711. *Dewan Bahadur Malji*: You have very strong views as to economic surveys in villages?—Yes.
6712. You are in favour of carrying on these surveys with the assistance of official experts wherever possible?—Yes.
6713. You do not mind Government spending money on it?—No.
6714. *Sir Henry Lawrence*: In the Dharwar district what proportion of the villages is subjected to damage by pigs? Are the pigs in every district or in a few villages only?—In 7 talukas of the Dharwar and Belgaum districts.
6715. Seven out of 12?—Out of 20.
6716. Nearly one-third of the total number of villages are damaged by pigs?—Yes.
6717. The damage is serious?—Yes.
6718. In one-third of the whole area of that district?—Yes.
6719. Is it equally serious in Bijapur?—No.
6720. In Belgaum?—In two talukas out of 10 (8 talukas and 2 mahals).
6721. So that the damage by pigs is limited to these villages which are in the neighbourhood of reserve forests?—Certainly.
6722. In your figures here on page 378 you say that 2,400 acres have been protected by a wall of 3 miles?—Yes.
6723. That wall extends only up to a certain portion?—On one side of the hill only.
6724. Do you find that the wall is effective? Does not the pig climb up on the other side?—It is 75 per cent. effective. On the borders of fields the people will still have to watch their crops, because the adjoining villages have not yet taken to fencing. They have applied to carry the wall along the hills, and until they do it there will be pigs coming and the border people will have to watch it.
6725. You speak of the evil of absentee landlordism. Can you give us any idea of the proportion of the land held by absentee landlords?—I can-

not give you accurate figures. In the parts where I have worked in the dry areas I think it comes to nearly 20 to 25 per cent. That is my rough idea; I have no figures.)

6726. Do you refer to all the three districts in your charge?—The dry tract of my division excepting Malanad and Gadinad. I am speaking of half the areas in my three districts.

6727. 20 to 25 per cent. in half the areas of three districts?—Yes.

6728. On page 374 you speak of tanks which now need repair and improvement?—Yes.

6729. Is any work now being done to repair or improve those tanks?—Not to my knowledge.

6730. Under whose charge are they?—It is the duty of the cultivators, as it is stated, but they have not done it in the past. (Of course it was also the duty of the Revenue Authorities to see that the silt was removed, but it has not been done in the past and as a result various small village tanks have been silted up)

6731. Have you any scheme to suggest for the improvement of these tanks?—I had a consultation with the Irrigation Engineer of Dharwar and he is of opinion that the tanks had better be raised than silt be removed; but he advised that in some circumstances the silt might be removed. We have been trying to start co-operative societies for the removal of silt, with some grant from Government.

6732. Is there anything to prevent the cultivators removing the silt themselves?—It is costly; it is a communal tank and nobody does it.

6733. Is not the silt of some value if it is put on the land?—It is to a certain extent, but the cost of carting is prohibitive and most of the fields below the tank are paddy fields.

6734. Then these improvements must be carried out by Government agency; that is your proposal?—That is my proposal.

6735. How is it to be financed?—By subsidising co-operative societies.

6736. By grants from Government?—Yes, and by long-term loans.

6737. Is there any famine in these particular areas?—Not usually.

6738. So that the work cannot be done by grants from the Famine Insurance Fund?—I am afraid it cannot be; it is not a famine tract.

You want to subsidise these particular cultivators at the expense of the general taxpayer. Is that your proposal?

6739. *Dr. Hyder*: To the extent of 90 per cent. the general taxpayer is identical with cultivators. Is that so?—Certainly.

The Chairman: The proportion between the whole of the taxpayers and the cultivators of this particular district is, I suppose, another matter.

6740. *Sir Henry Lawrence*: On page 380, you mention that "our elders in rural areas did it but their sons with the present education have abandoned it (agriculture)". Is that your view?—Yes.

6741. Is that progress taking place on a large scale?—It is taking place on a large scale.

6742. In your particular community among Lingayats?—Yes.

6743. Do you propose to do anything to stop it?—General agricultural education will help matters.

6744. You trust to that?—Yes.

6745. No propaganda can be undertaken in your community to prevent this drift away from agriculture?—I have not much faith in that. General education will help better.

6746. *Sir Ganga Ram*: How many years have you been Deputy Director of Agriculture?—I have been Deputy Director for the last four years, and altogether I have been in the department for the last 16 years.

6747. During these 16 years what improvements have you carried out either with regard to yield or quality of the crops?—So far as the Southern Division of this Presidency is concerned we have been working on three problems especially. In cotton we have done very well; for example, the selected Kumpta cotton has covered an area of 5 lakhs of acres. That means an increase of at least Rs. 5 per acre in yield, and an increase in profit of at least Rs. 2 per acre. That is one of the items we have been working on.

6748. Has that been done by your advice?—By the department; myself and the staff together.

6749. From demonstrations?—And from original research work on the farm.

6750. On cereals?—On cereals we have just been working on paddy and *juar*.

6751. Have you done anything on wheat?—No.

6752. Why not? Have you made any attempt to encourage the sowing of wheat in place of *rabi juar*?—(There are particular tracts in which wheat grows and there are particular tracts in which *rabi juar* grows. We have tried *vice versa* and we have mostly failed.)

6753. Is it on account of the nature of the soil?—The nature of the soil especially.

6754. Cannot you find out some seed which will suit the nature of the soil?—With all that the difference in profit between *juar* and wheat is very small. There is no particular advantage to the cultivator in growing wheat.

6755. What do you mean by 'no advantage'?—In the net profit.

6756. Is wheat selling at the same price as *juar*?—The yield from *rabi juar* is greater; it is 600 lbs. per acre, while wheat gives about 400 lbs.

6757. On an irrigated area?—No, in the dry tract.

6758. Depending on the rainfall?—Depending on the rainfall.

6759. *Sir Thomas Middleton*: At page 370 of your note you suggest that the produce of school plots should be given to the students. Is not that done in many cases already?—That is done to a certain extent.

6760. I think you suggest that it should be given to them as an incentive to take up the work?—It is one of the incentives.

6761. But the practice is common already?—It is done in the schools to a certain extent.

6762. What staff have you got working under you as Deputy Director in your area?—Eleven District Agricultural Overseers are working under me.

6763. How many of them have come from a college?—Seven are agricultural graduates from the Agricultural College and four are non-graduates.

6764. Have those four non-graduates been to college at all?—They have worked on the farms a number of years.

6765. They have been promoted?—Yes.

6766. I think there is a slip at page 372. You do not call *cyperus rotundus*, *hariali*, do you?—No, I am sorry.

6767. You were referring to *cyperus* and not to *hariali*?—Yes.

6768. You say on page 373 that when a cultivator has enough land for one pair of bullocks he is usually progressive. What amount of land do you think a cultivator should have in order to employ one pair of bullocks, in your tract, on light land and on heavy land?—It is not a question of light and heavy soils. We have got three tracts. In the Malnad paddy tracts, about 4 acres of paddy and about 6 acres of inferior millet is the ordinary rule; 10 acres altogether. In the transition tract, that is, between the western paddy tract and the eastern dry tract, they cultivate 24 acres, and in the eastern tracts generally it is 40 acres, with one pair of bullocks.

6769. With one pair of bullocks, 40 acres?—Yes.

6770. (They do not put all the 40 acres under cultivation every year; there must be a large amount of fallow?—They do not keep any fallow, except in famine, when, of course, the bullocks are not available.)

6771. Do they keep 40 acres clean with one pair of bullocks?—The weeding is very very little in the eastern dry tract where they have very little rainfall.

6772. Do they cultivate as much as 40 acres properly with one pair of bullocks?—Yes; even more than that; I have observed generally from 40 to 70 acres with one pair of bullocks.

6773. *Sir Ganga Ram*: Do they only plough once?—Ploughing is not done at all in the eastern dry tract, in the Bijapur district and in Nargund, Navalgund, Gadag and Rok talukas of the Dharwar district. All that is done is harrowing. Some cultivators give two harrowings; some three; and some very good cultivators up to four.

6774. How broad is the harrow?—(The witness indicated a breadth of about two feet.)

6775. *Sir Thomas Middleton*: The land which they cultivate is not red soil land?—No. It is ordinary black cotton soil.

6776. What kind of harrow do you mean?—They use the ordinary country blade harrow.

6777. You use prickly pear as manure. Do any people in your district make use of it as fodder except in famine times?—No.

6778. There was an attempt made rather further east than your district by one prominent landowner to use it in ordinary years, but evidently his example has not been followed?—Not yet.

6779. As regards use of manures, at page 375 of your evidence you have said that you have observed an increased use of ammonium sulphate and of cake manure. What you mean is that you have seen an increased use of the mixture?—Yes, a mixture of ammonium sulphate and cake for sugarcane.

6780. Formerly it would have been cake only. It is not many years since sulphate of ammonia has come into use?—Yes.

6781. Before sulphate of ammonia came into use, cake was used?—Cake? Before that they were not using cake either; they were only using the ordinary farm manure for sugarcane.

6782. What are cultivators using bonemeal for?—For the paddy crop especially.

6783. In the tract where *sann*-hemp is used for manure, is it a light soil?—It is black soil with murum soil below.

6784. You have two varieties of cotton in your area, Dharwar and Kumpta. These two varieties are commonly grown in your area?—Yes, Kumpta and Dharwar-American.

6785. Which is used for the heavier soil and which for the lighter soil?—Kumpta is used in the heavier soil, and Dharwar-American in the lighter soil.

6786. Are cultivators growing more Kumpta and less Dharwar than formerly?—No, they are occupying much the same area.

6787. *Dr. Hyder*: On page 380, you speak of poverty as being due mainly to ignorance. Will you agree with me if I enumerate the following causes of poverty. It is not merely ignorance, but the first cause is that there are too many people. Would that be one of the causes?—I agree.

6788. Then the second is that cultivators work only a small number of days in the year. Is that a dominant cause of Indian poverty or poverty in your particular district?—Yes.

6789. The third cause is that there are no other subsidiary occupations open to the people?—Yes.

6790. The fourth cause is that which you have given, ignorance?—Yes.

6791. Would that sum up the main causes of the poverty of agriculturists in your district?—I agree.

6792. At page 373, you propose that agriculture should be made more remunerative by reducing the rental values of the land. Do you think that would be effective?—I think so.

6793. You would be doing it at the expense of another man, the landowner?—The owner of the land, in my opinion, should be a cultivator. A decrease in absentee landlordism, in my opinion, is the pressing need.)

6794. But if the number of people remains the same, if they do not work a larger number of days, and they remain as ignorant as before, do you think the simple fact that they do not pay rent to somebody would increase their produce and *pro tanto* their prosperity?—I have laid stress on the point that the tenant holder cannot make both ends meet. In all the three tracts where I have been, the rental values have increased. That is the reason I have written that.

6795. *Sir Ganga Ram*: Do you guide the people in regard to the rotation of crops; as to what crops to grow after each other?—Certainly.

6796. Can you work out for me the best system of rotation for three classes of land, (i) canal-irrigated, (ii) well-irrigated and (iii) not irrigated, giving what crops you would grow. Please work out the rotation for a hundred acres for three years. If three years is not the proper rotation, you can take any period you like?—I can do that for my own tract.

6797. I do not want you to give it to me now, but you can send it to me later?—I can try.

(The witness withdrew.)

Lt.-Col. H. M. H. MELHUISE, D.S.O., I.M.S., Director of Public Health to the Government of Bombay, Poona.

Replies to the Questionnaire.

QUESTION 25.—I would offer the following suggestions for improving hygiene in rural areas.

The principal difficulties with which we are confronted are the superstition, ignorance and apathy of the people, and lack of funds. To overcome the former we must have recourse to education.

Although propaganda in public health work has been taken up by various voluntary societies and private individuals of recent years, their work is confined principally to the towns—little has been done in the villages except by the officers of the Public Health Department. These are, however, so few in number and the area over which they work so large that they have insufficient time to devote to this work. The establishment of Health Associations in all districts and the augmentation of the public health service is, therefore, called for. By the means of health exhibitions, magic lantern demonstrations, cinema shows, public lectures, the exhibition of placards and posters, and the distribution of leaflets, much may be done to enlighten the people on public health matters.

While this form of instruction will be useful in propagating knowledge among the adult population, it is of even greater importance that the children should grow up with a thorough understanding of the laws of health. To this end hygiene should not only be taught in the schools, but should rank as one of the most important subjects in the curriculum. The teachers should also be selected with care, and should if possible be themselves trained by instructors having a practical knowledge of public health work, and capable of imparting to their pupils an interest in and enthusiasm for the subject.

Attention to the following points is necessary when dealing with the question of village sanitation:—

1. Registration of vital statistics.
2. Notification and control of epidemic diseases.
3. Conservancy.
4. Protection of drinking water-supplies.
5. Housing.
6. Disposal of the dead.

The registration of vital statistics is performed by the village officers. On the whole the numbers of births and deaths are recorded fairly accurately, but it would be helpful if these officers could be made to understand that this work is an important part of their duties requiring care and attention and not to be shirked on any pretext. The value of the death statistics is, however, much impaired by the indifference shown to entering the cause of death intelligently. Village officers cannot be expected to diagnose complicated diseases, but they should be able to distinguish the commoner diseases for which there are names in the vernaculars. In many cases, all deaths not due to actual violence are attributed to fever. A Manual of Vital Statistics (abridged edition) for the use of these officers was published in 1922 and it would be useful if it could be made a text-book for study for the Talatis' examination. In 1924, classes for the instruction of village officers and others were started in the Western Registration District. They are held at convenient centres in the talukas by the Inspectors of Sanitation and Vaccination and include instruction in the accurate registration of vital statistics, early notification of epidemic diseases, protection of water-supplies, etc. If they prove successful in the Western Registration District, they will be extended to other districts.

The notification and the control of epidemic and contagious diseases.—Small-pox, cholera, plague and influenza are the four notifiable diseases. On the outbreak of one of these the village officer is expected to send intimation immediately to the Assistant Director of Public Health and the *mamlatdar*, and to keep a separate register, and send extracts from it regularly to the *mamlatdar* who supplies daily returns of the disease to the Assistant Director of Public Health during the outbreak.

Receipt of early intimation is the secret of success in dealing with epidemics, and it is important that the village officers should understand this. On the whole they appear to do so, but in some instances great delay occurs in reporting the outbreak and there is still room for improvement in this respect.

The control of epidemics also rests with the village officers. The officers of the Public Health Department can only advise as to what steps should be taken. In some other Provinces, District Health Officers and staffs have been appointed, whose duty it is to deal with epidemic outbreaks. They are said to be working with success (in Madras for instance) and their adoption in this Presidency would be a notable advance in public health work—the question is under the consideration of Government.

In addition to dealing with epidemic outbreaks, the District Health Staffs would carry out and control vaccination, and attend to village sanitation, propaganda and all the other branches of the work.

Conservancy.—In most cases this is very faulty owing to the ignorance of the people regarding the danger they run by allowing excremental matter and refuse to lie about near their homes as well as to neglect on the part of the village officers to have the work properly carried out.

The indiscriminate scattering of night-soil broadcast is not only a danger to the health of the community but is wasteful of a good and cheap manure. If this night-soil is properly conserved and dumped in pits mixed with *kutchra* as in the Nasik system of trenching, which is employed in parts of the Presidency, a valuable manure is obtained, and the public health benefits at the same time. The storing of manure is another example of wasteful and unhygienic methods. If dumped on the ground surface it breeds flies and as it dries is blown about in all directions until the air becomes laden with it. Manure should be stored in pits, well away from houses and water supplies and protected from flies by covering the outside of the dump with dried manure in which flies will not breed.

Protection of water-supplies.—Water is usually obtained from wells, rivers or tanks. Whenever possible it should be obtained from wells which are easier to keep free from pollution. The village officers should see that they are not misused and are kept in repair as advised by the Health Department. Tanks are open to gross pollution of all kinds and should never be used for drinking purposes unless under close supervision. Rivers also are open to pollution and during cholera outbreaks are a dangerous source of supply. If no other sources are available, the village officers should see that separate areas are set aside for drinking water, washing, bathing and watering cattle. Where possible, new wells should be provided to prevent the use of tanks and rivers as sources of drinking water.

Government makes a grant annually for the improvement of village water-supplies but this is not allotted in consultation with the Public Health Department which might with advantage be done.

A few years ago, an attempt was made in this Presidency to teach the people how to purify their drinking water, with special reference to threatened outbreaks of cholera. "Instructors" were appointed two to each Registration District who toured the taluka headquarters and important villages, holding classes or demonstrations for village officers, school-masters and others. The method of purification with potash permanganate was shown. For financial reasons these classes were discontinued, but they undoubtedly served a useful purpose and it is hoped that in due course they may be resumed.

Housing.—This constitutes one of the most difficult problems of all. A house in healthy surroundings is the first essential for a healthy life. Instead we find in Indian villages, insanitary, ill-ventilated, vermin infested, and dust laden dwellings, hardly fit for human habitation. The practice of keeping cattle and other animals in the living rooms further complicates the problem and renders the house unhealthy. In by-gone days it was a common practice, I believe, to change the site of a village from time to time. This custom would unfortunately be too costly to revive, and even the rebuilding or reconstruction of individual houses seems to be beyond the means of most villagers. The removal of animals from inside the house and provision of separate stable accommodation outside should, however, be insisted upon. Although the existing villages present so difficult a problem, new construction work should be carried out on hygienic principles under the guidance of the Public Health and Consulting Surveyor's Departments.

To sum up.—The measures suggested are—

The appointment of District Health Staffs and District Health Associations.

The education of the village adults by "propaganda."

The training of the children in the schools by well selected teachers.

The tightening of control over the village officers in the matter of registration of vital statistics and reporting of epidemics and, by degrees, the enforcement of by-laws in connection with sanitation of the village areas pending the introduction of a comprehensive Public Health Act.

Oral Evidence.

6798. *The Chairman:* Lieutenant-Colonel Melhuish, you are Director of Public Health to the Government of Bombay?—Yes.

6799. You have put in some very interesting notes and there are one or two questions I should like to ask you on them. Would you care to make a statement of a general character before we proceed to question and answer?—I do not think so.

6800. On page 391 of your notes you say, "The establishment of Health Associations in all districts is called for." On what basis would you organise these associations?—I think it might be done on a co-operative basis.

6801. You must have some central idea about which to create your organisation, must you not?—Yes, the centre of the district.

6802. In the next paragraph you say, "It is of even greater importance that the children should grow up with a thorough understanding of the laws of health." Do you think the existing systems of education supply that knowledge?—Not altogether.

6803. Do you think more might be done in the direction of making hygiene an item in the curriculum?—I think it might be emphasised more as an important subject of teaching.

6804. You would not attempt too much, you would be content to make plain to the mind of the child one or two leading rules of health. Is that the position?—Yes.

6805. On page 392 you suggest the provision of pure drinking water to villages. What do you recommend as the practical method of providing pure drinking water?—The sources of supply are always very impure; it is a question really of some method of purifying the supplies which already exist.

6806. There are two ways of regarding the problem, are there not? One is to attempt to provide water from a non-infected source, and the other is to attempt chlorination or some other method of purification of water already infected?—Yes.

6807. Which would you adopt?—First I should endeavour to provide pure sources, if possible.

6808. What is the most ordinary channel of infection of village drinking water?—It is personal. The people infect it themselves.

6809. How?—By their habits.

6810. What habits do you refer to?—They draw water from the source with their own utensils which are not usually clean. Then they wash their clothes, etcetera, in the neighbourhood and stack all sorts of refuse, impurities from which get into the well either directly or through the soil.

6811. There is no appreciation of the risks run by that sort of thing?—Not much.

6812. Where villages are provided with an ordinary well, that is, a well other than a step well, what is the ordinary channel of infection?—In the first place, directly from above the well.

6813. Do you mean from stuff thrown into the well?—Introduced by the buckets and things they use.

6814. By the vessels they dip in?—Yes.

6815. Do they dip the vessels from which they drink, or do they dip a bucket into the well?—As a rule they dip the vessels they bring to the well, unless there is a bucket provided. The remedy is to provide a bucket.

6816. Is there any other source?—Percolation through the soil; they draw water from the well and empty it there. That water runs back to the well through the soil.

6817. Apart from these two channels of infection, are there any others? Would a well with a pump and a cover and cemented for a sufficient distance below the surface to prevent the return of drainage water into the well before it passed through a sufficient depth of soil to purify it, solve the problem of providing pure water?—It should do.

6818. If you had a village well which was not a percolation well in the usual sense, but an impermeable tube sunk in the soil a certain distance with perforations in the tube so that water could be admitted from higher or lower water-bearing strata as might be arranged, do you think that would help to ensure a hygienic water-supply?—Certainly.

6819. Have you ever known an instance of a tube well being used?—Yes, many borings are done.

6820. For drinking water purposes?—Yes, there is a great deal being done in North Gujarat.

6821. What I want to get from you, if I can, is some statistics in support of the theory that such a plan provides a pure water-supply. Can you provide them?—I can get them I think.

6822. Speaking generally, do they bear out very strongly this contention?—Yes. I should say certainly, provided, of course, they stick to that water-supply and there is no other which they can go to.

6823. Where a convenient well supply is provided in a district, where there are also accumulations of water in ponds, or bunds, or wherever it may be, is it the custom of the people to confine themselves as far as drinking water is concerned to the water from the well, or is the tendency to take water from the most convenient place regardless of whether it is protected or not?—They have fancies; whichever water they particularly fancy they are inclined to use; but I think on the whole they prefer a well with sweet water to a tank, if there is a well there.

6824. What are the principal parasitic diseases borne by water in this Presidency?—One of the worst we have is the guinea-worm. Then there are intestinal diseases like dysentery, diarrhoea, cholera, and a certain amount of enteric fever.

6825. Would you suppose that comparing the health statistics of the villages provided with a good water-supply with those of villages not so provided, there ought to be a marked improvement in the health of the public as regards the incidence of these particular diseases?—Yes, there should be.

6826. And that, generally speaking, is in fact the case, is it?—I cannot say definitely.

6827. If there is in fact a very marked improvement, there is a strong case, is there not, for making the utmost exertions to extend the provision of pure drinking water to as many villages as possible?—Certainly.

6828. And taking into consideration the great loss in efficiency of labour as the result of these diseases, there will be a strong case on economic grounds alone for spending large sums on the provision of a pure drinking water-supply?—Certainly.

6829. At page 391, talking about classes for instruction of village officers and others, you say this is in the experimental stage. What is the trend of experience as regards those experiments? Are they promising?—The Assistant Director who has done this reports that the registration does show signs of improvement. There are not quite so many diseases returned as "fever" as there used to be; but it has only been going on for a short time.

6830. These classes were instituted purely to increase the accuracy of the returns?—They were also being extended to instruct them in simple matters of sanitation.

6831. May I take it that your department is watching very closely the result of these experiments?—Yes.

6832. How long do you think they will have to be maintained before definite conclusions are arrived at?—That is a matter of three or four years.

6833. On page 392, you are talking of the indiscriminate scattering of night-soil broadcast. To what extent is the sun a satisfactory destroyer of parasites of all sorts conveyed through the agency of night-soil?—It is quite effective if the night-soil is exposed to the direct rays of the sun, but then that is not necessarily the case.

6834. What is, as a rule, the practice; to cover it with earth or leave it in the sun?—It is exposed.

6835. Where it is exposed, do you think that the sun is a sufficient disinfectant?—It is very effective.

6836. It occurs to me that the danger to public health of this practice of relieving nature in the open fields has been a little over-emphasised; that where it is not the practice to cover with soil the sun is a sufficient germicide and destroyer of parasites?—The breeding of flies is the principal risk in the scattering of night-soil. Flies breed in it. The sun does not have much effect in that way.

6837. Is it really the case that the practice of going out into the open fields to relieve nature has an important bearing on the breeding of flies, not the deposit of large quantities of night-soil but the practice I refer to?—It is scattered all round the village, on the borders of the village, and certainly it leads to the breeding of flies.

6838. Do you mean that the eggs of the fly are laid in this matter?—Yes.

6839. In the full glare of the sun?—Yes.

6840. Then, on the same point, you say, "If this night-soil is properly conserved and dumped in pits mixed with *kutchra* as in the Nasik system of trenching, which is employed in parts of the Presidency, a valuable manure is obtained." The changes there are changes due to fermentation, are they not?—Yes.

6841. To what extent is fermentation a satisfactory destroyer of disease germs and parasites?—The night-soil is left there for a long period; heat is generated which destroys all infection in the night-soil.

6842. On the technical side it has been shown definitely that night-soil so treated does not carry infection?—That is so.

6843. That is perfectly definite?—It has been shown in a laboratory.

6844. I do not see how else you could discover the point, do you?—Simply by field work.

6845. *The Chairman*: I want to deal with one point on page 393. You say, "The removal of animals from inside the house and provision of separate stable accommodation outside, however, should be insisted upon." Is it a fact that the practice of keeping domestic animals inside the house leads to ill-health?—Yes.

6846. Does it cause any particular disease?—It simply introduces dirt into the house.

6847. Do you suggest legislation for it?—Not at the present time.

6848. *Sir Thomas Middleton*: Have you had much hook-worm disease in the Bombay Presidency?—So far as we know, we have none.

6849. *Professor Gangulee*: You had some public health organisations in the form of Village Sanitary Committees. Are they still in existence?—Yes; Village Sanitary Committees are still in existence.

6850. What about the Sanitary Boards?—There is only one Board left.

6851. These Sanitary Committees are under the control of local bodies?—Yes; they are under local bodies.

6852. Have you any supervision over them?—Only advisory.

6853. Could you tell us how they function?—On the whole, not too successfully. Some of them work all right, they carry out certain improvements, but they are not very well off, so they cannot do much.

6854. After the passing of the Village Panchayet Act, would you transfer these things into their hands?—Yes.

6855. Is that satisfactory?—There again, I think there is still some delay in getting the thing working. In fact, the Act is now being reconsidered.

6856. *Mr. Calvert*: Have the activities of your department been restricted at all by financial stringency?—Yes.

6857. You have had to drop several lines of activity?—Yes. Before the war there were various activities going on which have had to be discontinued.

6858. Is bad health in any way due to under-feeding?—It may be so; under-feeding would certainly affect their health in that way by a reduction of vitality.

6859. Would you say that milk was a necessary item of diet for adults?—For adults, no; it is for infants.

6860. *Mr. Kamat*: You refer to the establishment of Health Associations in the districts. You have some examples in urban areas, I think, of Health Associations?—Yes.

6861. To your knowledge, are they functioning well?—They have only been going two or three years.

6862. Are they purely non-official agencies or do they get a subsidy from Government?—Two of them get subsidies.

6863. Do you think that such Health Associations should be extended to all towns?—Yes.

6864. Do you think they should be subsidised by Government?—I would advise that, to give them a start.

6865. For purposes of sanitation in village areas do you advocate the passing of a comprehensive Health Act?—Not at present. I said "pending" in my note.

6866. That means the present provisions, either in the Local Boards Act or otherwise, are not sufficient, in your opinion?—Not for the future.

6867. Supposing a Public Health Act of a very comprehensive nature were passed, what machinery would be necessary for carrying its provisions into effect? Would it be through your department or the Local Boards or village panchayets? How would it be done in village areas?—Through the Local Boards, I presume.

6868. Or in villages through the village panchayets?—Yes.

6869. To your knowledge, do the village panchayets function well?—They vary; some do and some do not. I think they are reluctant to take much action.

6870. They do not look to village sanitation?—Not in all cases.

6871. Neither have the Sanitary Committees succeeded so far?—They are not so successful as they might be.

6872. Is it due to lack of funds or lack of public spirit?—I think it is due to both.

6873. It is also due to lack of public spirit?—Lack of interest.

6874. *Dewan Bahadur Malji*: Cattle sheds in villages were originally separate from residential houses and you advocate the continuance of that practice?—From a sanitary point of view, yes.

6875. The reason why animals have now to be tethered in the house is principally congestion in village sites?—Yes.

6876. Do you think any co-operative effort in the line of buildings on approved patterns will solve the question effectively?—I think it would go a long way towards doing so.

6877. Would you like to have some lessons on hygiene in general readers in the schools?—They already have them.

6878. Recently we have introduced a Village Panchayet Act. Wherever Sanitary Committees and Sanitary Boards formerly existed, and the people are unwilling to have village panchayets in their area, is it true that they

are now without village panchayets or Sanitary Committees in their villages or towns?—In many villages there is nothing.

6879. Do you approve of that idea?—No.

6880. Take the example of the town of Amod in the Broach district. Formerly it was a municipal town. The Municipality has gone and the Sanitary Board has gone and there is no village panchayet. I take it that you will be surprised to hear the town remains without any sanitary arrangements?—There are many like that.

6881. Is there no remedy for it?—Education, I think, is the only remedy.

6882. Why are not Sanitary Boards set up when people will not have village panchayets?—They will have to be re-established, I suppose.

(The witness withdrew.)

Mr. E. J. BRUEN, Livestock Expert, Government of Bombay.

Note on Cattle-breeding.

Necessity for cattle in the Bombay Presidency.

Cattle are especially essential to India for the following reasons:—

(i) *As draught animals.*

Bullocks have been used in India for generations for supplying the necessary draught for road and field use. It is doubtful if any other draught power will ever be used extensively enough in India to do away with the bullock. (The fragmentation of holdings makes it practically impossible for any mechanical power to be used generally and horse power would be a further burden on this country since most of the cultivation is on the one crop system.) Moreover it would take generations to teach the people to handle any other than bullock power in cultivation.

(ii) *As a milk producer.*

India more than any other country in the world requires milk. It is not only essential as a necessary part of the daily diet of infants and adults alike, but it is used extensively in cooking. The Hindu being a vegetarian will not use any other form of fat in his cooking except butter fat.

(iii) *As manure producers.*

(It will take years to introduce the use of artificial manure on an extensive scale into agriculture on an extensive scale. It is, moreover, very doubtful whether it will ever become popular owing to the Indian cultivator being so poor.) The cultivator's cattle, if they give no other return, do produce a certain amount of manure, which helps to keep up the fertility of his soil.

It will therefore be seen that cattle are, have been and always will be essential to the country.

Method of producing and breeding in the past.

Cattle-breeding in the past in India was undoubtedly carried on by a professional breeder, who raised his cattle by migrating from place to place in search of food and water for his cattle. His year usually commenced from *Diwali*. He left his home after *Diwali*, with his cows headed by a selected bull in search of good grazing and water, travelling through dense jungles and forests. Cattle being of little value, sick, weak and lamed animals were left behind to die or be devoured by wild animals. In this way disease was stamped out and had little effect. He bred unconsciously by selection or the survival of the fittest. As one bull headed the herd, there was little chance of cows being crossed by any other than the bull intended for the purpose. In his wanderings his cattle got different types of grasses. The variety made up a food that was balanced and beneficial to the cattle which were at the same time raised at little or no expense. He returned to his home after *Diwali* to dispose of his male stock, which were taken up by professional rearers to train them and sell them eventually to the cultivator. Absence of roads, of bridging over rivers and of railways, seemed that each breed or type was kept pure. The population of the country being scattered in small villages, towns or hamlets and the sale of the produce of the cow being local, it was to be had in abundance and cheap.

Position to-day.

The professional cattle-breeder is fast dying out, the only professionals now remaining are the Rabari or Barwad of North Gujarat and the Dhangar of Ahmednagar district. But as cattle-raising is now generally confined to

villages, the cattle are kept more or less constantly in one place; the treatment given is nevertheless practically the same as under nomad conditions, i.e., the cattle are not fed and dry cows are expected to thrive on the grass available (which is very meagre for 6 months of the year). In the grazing fields, moreover, as many adults entire males are found as females and the cattle are continually mixed. When disease appears, therefore, it takes a toll of 30 or 40 per cent. and those that do recover, are usually unfit for further use as breeding animals. The net result is under-feeding, promiscuous in-and-in-breeding, crossing and the constant dread of diseases. Naturally under such conditions a deterioration has set in, which will be difficult to check.

Price of cattle and cow products compared.

It is difficult to strike a comparison of the cattle and cow products of to-day with those of even some 25 years ago, as the prices of both livestock and dairy products even to-day fluctuate considerably, and the only authentic records of the past are the Gazetteers of the different districts published about 1880. At this time cows of certain breeds could be purchased for anything from Rs. 10 to Rs. 60, bullocks from Rs. 40 to Rs. 200 the pair, milk from 16 to 20 lbs. per rupee and ghee at the rate of 4 lbs. per rupee. To-day the prices are just about double in all cases. In cities milk is now sold at from 6 to 8 lbs. per rupee and ghee $\frac{1}{2}$ to 1 lb. per rupee.

Obstacles to improvement.

In India, unlike any other country, there are many obstacles to the improvement of cattle, which cannot be easily got over. They are:—

(1) Religious prejudice to the slaughter or killing of animals infected with disease. This means the spread of disease, which cannot be stamped out but must take its course. Then, too, there is the objection to the isolation of undesirable entire bulls from a herd, religious principles stating a bull was put into this world for a purpose and this purpose must not in any way be restricted.

(2) The castration of undesirable bulls. This is also objected to on religious grounds. The cultivator also holds the opinion that bulls castrated early become effeminate, the neck not developing, and in their opinion the powers of endurance and the working qualities are reduced considerably by early castration.

(3) The starvation of female stock from time of birth. No attention whatsoever being paid to the female with a consequence that even the male gets a set back in *embryo*. If a cow has a female calf, the cow is milked or another male calf is given to the cow, her own female calf only receiving sufficient to keep her alive. This naturally gives the breed a set back. The idea is still prevalent in India that the sire counts for very little, they firmly believe that the impression stamped on the mother's mind whilst being served has the power of producing good or bad progeny. Therefore little or no attention is paid to the bull used except by the professional breeder, who does attach a certain amount of importance to the bull. The frequent recurrence of famine also plays havoc with the cattle of the country. The farmer in no circumstances lays in a stock of fodder. In some cases he is afraid to do so, owing to enemies setting fire to such stores. In the majority of cases it is due to the fact that the cultivator or breeder does not care and does not know better.

The fragmentation of holdings plays a great part in cattle-breeding and the possibility of improvement. The holdings are too small to support even one pair of bullocks the year round, the cultivator buying a cheap pair of bullocks to do his work and then selling them when finished with. The demand therefore at present for good working cattle is limited. To eradicate these beliefs, to deviate from the opinions he holds, will take years.

Necessity and the dearness of cattle have made a certain section of the Presidency take more interest in their cattle and now breeding of cattle, which was unknown at one time, is flourishing.

The buffalo as an agent in deterioration.

It is evident from old religious teaching and writings that the buffalo is only of recent introduction as a milk producer as only the cow is mentioned and is more or less worshipped on account of her usefulness to humanity in general. The buffalo now, however, although of recent introduction, has superseded the cow as a milk producer. This is due to the fact that the buffalo produces large quantities of fat of a higher melting point, which is so useful for cooking purposes. Owing to the buffalo being the recognised milk producer, no attention is now paid to the cow and her female stock. In the buffalo it is the reverse, the female stock are given attention and the male stock die as being of no use as a draught animal. This neglect of the female stock due to the competition of the buffalo has been a direct cause of deterioration of the country cow. The set back the cow has had in this respect, will take years to improve and the buffalo is likely to get a bigger hold each year.

Feeding.

The cow and her progeny although held in reverence by the people receive little or no attention except when actually useful as in the case of the bullock during the several farming seasons. The buffalo, which is producing milk for 8 months of the year, gets good food and attention. (In Gujarat in the poorest of cultivators' families will be found an earthenware cooking pot in which the she-buffalo's food is being prepared.)

Attention is being concentrated on the female buffalo, which naturally must improve, the cow which is getting more and more useless other than for production of bullocks and manure, is receiving less attention each year. It might here be noted that the nature, build and colour of the buffalo makes it impossible to ever improve it sufficiently to compete with the cow as a draught producer.

Types of cattle in the Presidency and their necessity.

In the Bombay Presidency we have a breed of cattle suited in each case to the soil and climatic conditions of its natural home. We have breeds suited to sandy dry soils with little or no rainfall where the larger portion of transport is conducted on camels, i.e., Sindh. In Gujarat we have a large up-standing breed, which is admirably suited to the deep rutted roads of Gujarat. In the hilly wet tracts of the Ghats we have a breed, which can withstand, and thrive under, such wet and rough under-foot conditions. In the Central Deccan we have a small fast hardy breed, which thrives on the poor pastures, is able to get over the land quickly in short ploughing and sowing seasons and is suited to fast draught. It is doubtful if any other one of these breeds would suit, or thrive under, the conditions that the indigenous animal of the tract lives and works under. It is therefore essential that this very large number of breeds should be fostered and cared for.

What has been and is being done for cattle-breeding in the Bombay Presidency.

From available records it is seen that the Government of Bombay have been trying to improve or to do something towards the improvement of the cattle ever since 1881. The first step taken after extensive inquiries was to place bulls in each district through the agency of the District Local Board. The method adopted was the same that had been in vogue for generations in India, i.e., dedicating a certain number of bulls to a particular deity. These bulls were branded with the deity sign and let loose. The system was originally introduced by the Brahmins, the eldest son of a Brahmin considering it

his duty to purchase and dedicate bull to his god on the 11th or 13th day after the death of his father. These bulls were the property of no one in particular, every Hindu resident feeding the bull in some form or other. This being the practice at the time, Government through the Local Boards tried the same methods. This method failed for several reasons, the chief being that the bulls became a nuisance and had to be destroyed. In Nasik district Government had to come to the assistance of certain localities to destroy these bulls, which were known as 'Pol, Walli and Pen bulls'. Later on the District Local Boards made further attempts by purchasing the most likely bulls available and keeping these at stud like a horse stallion. This also failed, the bull either getting too fat or getting so fierce that no one could get near him. The failure of both these systems was but natural and to be expected. However it is sufficient to show that as far back as 1881 one of the chief reasons for the deteriorations lies evidently in the scarcity of good bulls. Government through the agency of the Civil Veterinary Department and the Agricultural Department made many extensive inquiries into the subject from the experience then gained. The European method of giving out premium bulls to known persons was introduced by the Civil Veterinary Department in 1907. Two areas—one in North Gujarat (Ahmedabad district) and the second in Sholapur district—were taken in hand and bulls on a premium system were given out. Under this system a bull was purchased in consultation with the prospective premium holder, Government paying half cost and the premium holder the other half. Government then paid a premium of Rs. 4 per mensem as feeding charges and at the end of 3 years the bull became the property of the premium bull holder (Rules in detail appended).

During this period Government found it difficult to purchase good bulls. It was decided to start farms for each breed and produce good stud bulls. At the same time a system of holding small village shows was introduced. The introduction of the premium system and the holding of shows had a certain amount of good effect. The Government in 1918 considered the question of cattle-breeding to be sufficiently important to start a new section of the Agricultural Department. A special Deputy Director of Agriculture for Animal Breeding was appointed with the necessary district and office staff. The district work in hand and the Northcote Cattle Farm, Chharodi (District Ahmedabad) was handed over to him by the Civil Veterinary Department. Up to this period the chief aim was the improvement of the draught qualities of the breeds taken in hand. The work in hand was continued and investigations were set on foot as to the form further development should take.

Results of inquiries.

It was ascertained after inquiry that the greater number of the cattle in the Presidency, including the buffalo, were uneconomical animals. The production of cattle was purely a mechanical increase of, if anything, a more degenerate and more uneconomical animal with each generation. The chief defects which make the animal uneconomical being:—

- (i) The very small amount of milk produced by the cows; in some cases hardly sufficient for the maintenance of the calf.
- (ii) The late maturing of all breeds in the Presidency; the normal age at which an animal either calves for the first time or becomes useful as a draught animal being between 4 years and 6 years of age.
- (iii) All breeds in the Presidency are shy breeders, i.e., they calve once in 18 months or 2 years.

In consequence of these defects in the breeds of the Presidency, the cattle-breeding or rearing industry is gradually dying out as it is now no longer possible to raise cattle for practically nothing as in the past. Consequently

cattle now have to tend for themselves, no attention being paid whatsoever to them. A cattle owner or breeder owning a cow gets his cow served and hopes for the best.

The aims of the Agricultural Department are based on the improving of the very essential qualities enumerated above, i.e., (i) to breed milk and more-milk into each breed, (ii) to breed early maturing qualities into each breed so as to get them to become useful at half the present age, and (iii) to breed regularly of calving into the stock of bulls which it puts out, it being a recognised fact that these qualities can be imparted by a pure bred bull possessing such qualities. With this end in view the policy of the one existing farm was changed. (Government Resolution appended.)

Northcote Cattle Farm, Chharodi.

The Northcote Cattle Farm was originally started as a Preservation Society in the famine of 1899. At this time some 589 head of cattle were purchased at an average cost of Rs. 49 per head. The society depended for its finance on public charities. In the year 1907 it was handed over to Government as the funds of the society could not meet the necessary charges.

The Kankrej breed from the commencement was raised on the open ranching system. The farm having an area of 2,300 acres of land, the cattle were grazed all day. Until the year 1919, when the farm was handed over to the Agricultural Department, the cows were not milked as the only aim in view at the time was improvement by selection of draught qualities only. Breeding for draught only meant the neglect of the milk qualities with a consequence that, after a few generations, the cows hardly gave enough milk to nourish their young. The cattle not being handled, it was a difficult matter to tie the animals for milking. However in 1921, 49 of the best cows were taken in hand and the annual lactation yield for the 1st year was 480 lbs.. The work has been continued and the present year the yield of milk has reached 1,330 lbs. per animal, the calf at the same time being suckled by the dam. Each year by selection the low yielders, irregular calvers, late maturing animals and those not conforming to type were cast and sold.

By this means the yields have increased, more regular calvers are being bred, heifers are calving much earlier and the bullocks are coming into use at a much earlier age. A comparative statement of the improvement since 1921 is appended.

Bankapur Farm.

The next breed to be taken in hand was the Amrit Mahal, a breed used in the Dharwar, Belgaum and Bijapur districts. Up to this time the Dharwar district was considered to be a non-breeding district, i.e., the cultivator purchased his necessary draught cattle which were available in large number in Mysore State at a fairly reasonable figure.

The Bankapur Farm for this breed was started in the year 1920-21 by purchasing 22 cows and 2 breeding bulls, this number was again added to in the year 1921-22 by 25 cows and 1 breeding bull.

The Amrit Mahal is a purely draught type of animal but it is hoped that in time the breed will give a small quantity of milk over and above that required by the calf, the aims and objects of this farm being the same, i.e., to produce an animal that will become useful at a much earlier period and will produce more progeny in its life-time or calve more regularly.

Red Karachi or Sindhi breed of cattle.

In the year 1918 a farm known as the Willingdon Cattle Farm was established for this breed by public donations with an assurance from Government to carry on the farm. The farm was located first at Mirpurkhas, then at

Landhi and eventually on the site, which it is now occupying, at Pihai, Malir, Karachi. The Sindhi being more or less purely bred for milk, it has been considered of little value as a draught animal. The objects of this farm are to improve the breed in the same way, special attention being paid to milk.

Other breeds.

Leaflets of all the important breeds giving description, usefulness, etc., are appended.

Other agencies for producing bulls.

1. By the utilisation of *pinjrapoles* and *gowrakshaks*.
2. By encouraging the starting of co-operative cattle-breeding societies.
3. By encouraging the keeping and breeding of good cattle by big landlords.

1. Pinjrapoles and gowrakshaks.

In nearly every town in the Presidency of any size where the Gujarathi Hindu or the Jain has made a home will be found a *pinjrapole* or *gowrakshak*. These institutes are maintained by charity and by a cess levied on themselves by the Hindu and Jain. In some instances their incomes are large and in others small according to the trade of the town.

The object of these institutes is to preserve the lower animal life where good, bad, maimed and blind cattle are to be found. They are usually well equipped with good buildings with ample accommodation. Having been started years ago, they hold good sites and in some cases good and ample grazing land.

During years of scarcity and famine good specimens of all breeds filter into these institutes, being purchased to prevent them from being slaughtered. At present little or no material benefit is derived by the country from these institutes. In these institutes there are, therefore, possibilities. They have the necessary buildings and in some cases the necessary good stock, which are fed and cared for fairly well.

Endeavours are now being made to get such institutes to co-operate with Government by setting aside good cows of a particular breed, a bull being supplied by Government and Government also paying the pay of a trained graduate to manage the institute. Two such *gowshalas* are already working and the results so far have been fairly satisfactory. As such institutes exist in nearly every district, it would help considerably if they could be made to see the great benefit the country would derive, if they made their institutes not only asylums for the useless but set aside even a part to produce good bulls.

2. Co-operative cattle-breeding societies.

This also is a fairly good agency for a supply of good bulls. The great drawback to the societies is that they are usually formed and run by the more enlightened of a village, a class of persons that has had little or nothing to do with cattle, the result being that although the breed is kept pure and improved on in this respect, it will be many years before they can produce bulls possessing the desired qualities. The societies are not wealthy concerns and they run their farms on as economical lines as possible with the result that what good is gained by mating the best is lost in the produce not being fed sufficiently to maintain or carry on the improvement. These societies however, are useful in that they can and do supply improved bullocks.

In the Dharwar district since the year 1922, 18 co-operative cattle-breeding societies have been started. This area at one time did not breed. Through the agency of propaganda by the Co-operative Department and the Agricultural Department and through the increase of price interest has been

aroused. In addition numbers of villages have formed bull clubs and are now keeping for the benefit of the village, bull of known qualities produced on Government farms, the demand now being greater than the supply.

Taluka Development Agricultural Associations are now taking a keen interest in the cattle of their respective talukas and this agency has helped considerably in enlightening the people regarding the better treatment of cattle and the use of pedigree bulls.

3. *Private persons.*

Government have given lands on concession terms to private persons for cattle-breeding. Lands are given on the express understanding that a certain number of good cows will be maintained headed by a bull supplied by Government. The results from these are, however, not very encouraging owing to poor management and still poorer feeding. These attempts are, however, only a drop in the ocean and supply only a very small percentage of the bulls necessary.

Starting of farms, material available and time required for results.

In India in the past and to-day a pedigree animal was and is an unknown quantity. The cattle are on the whole poor. In certain restricted areas a few animals will be found conforming to a particular type, having the same colour, outward conformation, size and shape of horns. Nothing further in regard to their breeding is, however, known. From these few animals have been selected the best and located on a farm. It is only with rigid selection for years that one can ever hope to get anything like a pure herd together, taking into consideration that the Indian cow calves for the first time in 5 or 6 years. Instances are appearing each year where one cow served by the same bull in three consecutive years has produced three calves totally different in colour and conformation. More farms are needed and more *goushals* to co-operate with Government before any work on a large scale can be reached.

It must here be clearly understood that at present the public at large do not appreciate "pedigree bulls" and therefore good bulls do not command the price they should do. Pedigree bull production is a costly business as only a small percentage of those grown and reared are really of value. Therefore in India pedigree bull breeding cannot pay and will not for years be a commercial proposition. In European countries a pedigree breeder may produce 10 bulls, on 9 of which he loses money but the 10th brings in such a price that his business flourishes.

In India to-day the value of a bull is calculated on his carrying a few lucky marks and conforming to a particular type. He is known as 'Jatwala' or an 'Assal.'

Bulls of this description not being pure bred throw in different progeny with the net result that there is no advance made. The percentage of selected breeding animals from such a herd in a year is about 10 p.c. It will therefore be seen that to get the right animal or herd together will take years and cost money. Each year makes it more and more difficult to procure the necessary cattle with which to start a farm.

Effects in the district.

In establishing a farm the cattle have been bought from the breeder himself. He knows his cattle. Consequently he knows that you cannot for a few years produce any better than he himself has produced, as he has kept the best and sold you what he does not want. Despite all this in the past

6 years considerable interest has been aroused. The reports of the very many inquiries made considered certain areas breeding areas and others non-breeding areas. Among the latter were included Dharwar and Sholapur districts. To-day these two districts are doing as much breeding as any others.

Disease.

In the Bombay Presidency fatal cattle disease is practically always in existence. To improve successfully the cattle, legislation for the isolation of infected villages is absolutely necessary. The more general use of inoculation and vaccination must also be introduced.

Cattle Breeding Management of the Chharodi Cattle Farm in North Gujarat.

GOVERNMENT OF BOMBAY, REVENUE DEPARTMENT,
ORDER NO. 198.

Bombay Castle, 21st January 1920.

Letter from the Director of Agriculture, No. 263, dated 8th January 1920:—

“1. I have the honour to approach you with regard to the future of the Chharodi Farm in North Gujarat, recently taken over from the Civil Veterinary Department and placed under the direct charge of the Deputy Director of Animal Breeding. After a very careful survey of the situation there, Mr. Bruen has approached me with certain proposals some of which I venture to lay before you for sanction. In this connection I have myself visited the farm, and have been closely into the matter with Mr. Bruen.

“2. The object of the farm, it may be recalled, was laid down in 1907, the views of Messrs. Morgan and Mollison being accepted by Government (Government Resolution No. 9823, dated October 7th, 1907, Revenue Department) and was as follows:—

- (a) to maintain a herd of pure North Gujarat cattle;
- (b) to improve the breeds of North Gujarat cattle, by breeding with bulls of as near an ideal type as possible;
- (c) to issue, as premium animals, bulls produced on the farm where they are required in the districts, subject to special premium bull rules.

“The experience of the last few years shows that there are two distinct types of North Gujarat cattle, both of which are found in the Chharodi herd, namely, the ‘Kankrej’ and the ‘Wadiyal’. These seem to have been usually considered as one by most of the authorities on the subject, but they are really very distinct; of these the ‘Kankrej’ is the more valuable and profitable animal, being faster at work and (as has been proved at the Surat Farm), a very good milch animal. The ‘Wadiyal’ is a coarser and bulkier animal, slower and apparently chiefly suitable for heavy slow draught.

“We have apparently fairly satisfactory herds of these two types of animals, and after casting (at a good price, however) about eighty to ninety animals out of a herd of six hundred and fifty, Mr. Bruen thinks that we shall have the basis of first class herds of these two breeds. The only addition we shall want from outside will be the obtaining of two first class ‘Wadiyal’ bulls from the neighbourhood of Radhanpur, at an estimated cost of Rs. 800. The herd will itself be able to produce ‘Kankrej’ bulls for its own use, better than any that can be obtained from outside.

" 3. The farm at Chharodi contains about 2,700 acres, but it has never been surveyed. It is at present one huge paddock, with a single boundary fence. There are practically no interior fences and the result is that the herd cannot really be split up into portions and as the bulls must roam with the herd, it is difficult, if not impossible, to maintain two pure breeds. In order to make this possible and at the same time to prevent certain parts of the farm being over-grazed and the herbage spoilt, it is essential. I think, that the farm should be divided up by fencing into a number of blocks of about 400 acres each. This will entail a careful survey of the property and then the planning of fences to secure the object aimed at. Mr. Bruen estimates that wire fences to achieve the end in view will cost Rs. 18,000 and I have to request you to move Government to sanction the expenditure of this amount for the purpose.

" 4. Mr. Bruen is of opinion and I agree with him, that with a standard herd like that at Chharodi, where the young stock are already of great value and will continually tend to increase in value, the stock should be, partly at any rate stall-fed. This means a considerable expenditure, estimated at Rs. 5,000 for masonry troughs, chains and other necessaries for this purpose. Hitherto there has been no stall-feeding except for the very young stock. I have to request you to ask Government to sanction this expenditure.

" 5. It is also necessary that we should have a much better water arrangement than at present. At present the cattle drink from tanks which are filled with rain water and then remain stagnant. I propose the erection of a small engine and pump on our well with overhead tanks and water connections to each of the cattle yards. This arrangement would be of great use also in case of fire and so far as I can learn there has been a small fire almost every year. As we have often over twenty lakhs of pounds of fodder stored, this is of very great importance. Such water arrangement as is needed is estimated to cost Rs. 6,000 and I have to ask you to move Government to sanction this amount for expenditure during the coming financial year.

" 6. It is also necessary to keep a very much larger amount of fodder on the farm in the form of silage. At present there is one silo only and the number needs to be very much increased. I venture to propose that Rs. 10,000 be granted in the coming year for increasing the provision for making and keeping silage.

" 7. The staff of the Chharodi Farm at present consists of:—

- (1) A Manager on Rs. 150 per month with a personal allowance of Rs. 30 to the present Manager, Mr. Nagarsheth.
- (2) A Salutri—clerk—on Rs. 40 per month.
- (3) A Fieldman on Rs. 30—2—40 per month.

As I propose now that at least 200 acres should be placed under cultivation in the coming year and as the system which is to be followed in the future will mean very much more careful records than in the past, I venture to propose that the following staff should be sanctioned for the future:—

1. Manager on Rs. 150—10—250 per month.
2. An Assistant Manager, on the cadre of 4th grade Agricultural Graduate Fieldmen, i.e., Rs. 60 during one year's probation and then on Rs. 75—5—100.
3. A Salutri—clerk—on Rs. 40—2—60.
4. A Fieldman on Rs. 30—2—40.

This involves only one new post, namely that of Assistant Manager. The others simply involve continuation of the present arrangements on slight alteration of rates of pay.

" 8. The definite proposals which I venture to submit to Government are that:—

(a) The following special grants should be included in the budget for 1920-21 for the Chharodi Farm:—

	Rs.
1. Purchase of two 'Wadiyal' bulls	800
2. Troughs, etc., for stall-feeding animals	5,000
3. Fencing for dividing the farm	18,000
4. Pump and tanks for water-supply	6,000
5. New silos	10,000
TOTAL	39,800

(b) The following posts should be sanctioned as the staff of the Chharodi Farm in place of those at present existing:—

1. A Manager on Rs. 150—10—250 per month.
2. An Assistant Manager on the cadre of 4th grade Agricultural Graduate Fieldmen on the usual pay.
3. A Salutri—clerk—on Rs. 40—2—60.
4. A Fieldman on Rs. 30—2—40.

" 9. I make these proposals with confidence as from present indication the Chharodi Farm is likely, in the near future, not only to be a very valuable institution from the point of view of maintaining the cattle of the country but also to be a very paying proposition.

ORDER.—The proposals made by the Director of Agriculture are sanctioned with effect from 1st April 1920.

2. The Accountant General should be requested to make the requisite provision in the second edition of the budget."

Old Premium Bull Rules—Conditions.

1. Half the initial cost of a premium bull to be paid by the agent or on behalf of subscribers resident in the village concerned.
2. Rs. 4 per mensem to be paid by Government to the agent for maintenance charges.
3. The bull to be the property of the agent after three years if he has subscribed half the initial cost himself, if the cost has been raised by subscription, the bull to be sold after three years and the proceeds utilised in paying towards the cost of another premium bull.
4. The bull to be properly cared for by the agent and to be allowed to graze with his cattle. The agent to be held responsible for the bull's condition.
5. The services of the bull to be made available free of charge to cows belonging to residents of the village only. The bull not to be allowed to cover more than one cow a day. In case of more than one cow being brought on one day, the best cow to be selected for the services of the bull.
6. A register of cows covered to be kept by the village officer from information supplied to him by the agent.
7. Premium bulls are not to be worked.
8. Neglect of above rules to involve forfeiture of the bull with no compensation.

Revised Premium Bull Rules and Regulations.

1. The premium bull will be issued in each case in the name of one approved person to be known as the agent who will be solely responsible to Government

for the care and management of the bull which must be maintained in good breeding condition.

2. The agent may be a private individual or the representative of a group of persons such as the inhabitants of a village or the members of a co-operative society.

3. In selecting its agents Government will take into account—

- (1) the quality and number of the breeding cows available, with a view to the bull being used to the best advantage,
- (2) the suitability of the locality—in particular as regards (a) grazing and water facilities, (b) fodder supply and (c) climate,
- (3) the enthusiasm of the people as evidenced by their preparedness to
 - (a) store fodder whether as hay, *kadbi* or silage.
 - (b) to eliminate from the village all entire males either by castration or removal.

4. The agent will be required to sign a stamped agreement embodying the rules and regulations governing the terms of issue of premium bulls.

5. The agent will make the services of the bull available for all the cows approved by the body he represents.

6. The Livestock Expert to Government will represent Government in dealing with agents under these regulations and his decisions will be final.

7. Premium bulls will remain the property of Government and payment of the hire charge mentioned under rule 11 will give no title of ownership of the bull to the agent or the body he represents.

8. The bull will normally be issued for a period of three years and at the end of that period Government will replace the bull free of charge—but Government reserve the right to take back the bull at any time it sees fit to do so without compensation.

9. The replaced bull will be at the absolute disposal of Government.

10. Government will also replace the bull if the agent or the body he represents finds it unsatisfactory.

11. The hire charge for the bull will be one-half or one-quarter of the market value of the bull.

12. Government will contribute a maintenance premium of Rs. 10 and Rs. 5 per mensem on the following conditions:—

- (a) If the hire charge is one-half of the value of the bull, Rs. 10.
- (b) If the hire charge is one-quarter of the value of the bull, Rs. 5.
- (c) Provided Rs. 5 are spent on feeding concentrates for the bull.

13. Payment of the premium will be made monthly provided the post card referred to in rule 15 is received. Otherwise the agent will forfeit the premium.

14. The agent will maintain a register in which will be entered all services.

15. Post cards will be provided by the Department of Agriculture and the agent will be responsible for despatching one post card each month to the Agricultural Officer in charge of the Circle in which will be noted all services during the month.

16. The bull will be regularly inspected by a representative of the Bombay Department of Agriculture; the agent will be present at these inspections and will produce the register.

17. Government are prepared to promote cattle-breeding in those villages already possessing breeding bulls, by providing a premium bull free of cost in place of each such bull which may be surrendered to Government. If the surrendered bull has been dedicated to God, Government will hand it over to a suitable *pinirapole*.

Northcote Cattle Farm, Chharodi.

Statement showing the marked progress in yielding capacity of the Kankrej herd within the period of five years.

Serial No.	Year.	Number of animals milked.	Number of animals yielding 1,500 lbs. and above during the year.	Annual average yield for animal milked.	REMARKS
1	1921-22	100	6	Lbs. oza. 438 11	
2	1922-23	69	4	637 11	Milking operations were begun in December 1920.
3	1923-24	67	13	827 7	
4	1924-25	109	16	932 11	
5	1925-26	93	32	1,330 14	

Northcot Cattle Farm, Chharodi.

The animals were calving at the age of 6 and 7 years in the time of the Civil Veterinary Department and this was always a problem with them. The following remark appears in the annual report of the Civil Veterinary Department for 1916-17:—

“ 66. The cows at Chharodi mature very late for some reason and quite a small number produce calves before 6 years of age. 160 cows over 6 years of age produced 75 calves whilst only 16 cows calved out of 74 between 4 and 6 years. The question is being considered from all its aspects with a view to effect some improvement ”.

During the year 1925-26, 33 animals calved for the first time on this farm and the average age at which these animals dropped calves works out at 4 years and 9 months. Out of these there were only two that calved at an age over six years and only six that calved at an age between five and six years. One animal calved at as early an age as 3 years and 7 months and another one at 3 years and 8 months.

The total number of births during a particular year has also considerably increased of late and the last two years' can be taken as the record years in the history of the farm in this respect.

A statement showing the number of births.

Year.	Number of cows.	BIRTHS.		REMARKS.
		Male.	Female.	
1920-21	256	65	60	
1921-22	212	65	66	
1922-23	153	53	63	
1923-24	194	40	52	
1924-25	201	68	59	
1925-26	195	85	81	

Willingdon Cattle Farm, Pihai, (Sind).

Statement showing the marked progress in yielding capacity of the Sindhi herd within the period of four years.

Serial No.	Year.	Number of cows.	Number of cows yielding under 3500 lbs.	Number of cows yielding over				REMARKS.
				3,500 lbs.	4,000 lbs.	5,000 lbs.	6,000 lbs.	
1	2	3	4	5	6	7	8	9
1	1923-23	38	4	...	2	Columns 4 to 8 show number of animals completing a lactation in the year.
2	1923-24	35	13	5	7	7	1	
3	1924-25	39	20	5	5	5	...	
4	1925-26	33	18	5	8	9	3	

Oral Evidence.

6883. *The Chairman* : Mr. Bruen, you are the Livestock Expert to the Government of Bombay?—Yes.

6884. You have put in a most interesting and useful note on cattle-breeding in this Presidency for which my colleagues and I are very greatly obliged to you. Do you wish to make any statement of a general character at this stage in amplification of your note?—No; I should prefer to be asked questions on it.

6885. Do you agree that the improvement of the quality and condition of cattle in the Presidency would be one of the most substantial contributions to a better system of agriculture?—I am sure of it.

6886. Do you think that the present organisation of your own department, the Agricultural Department and the Veterinary Department, and the co-ordination between them is such as to offer the best hope of that improvement in the breeding of cattle?—No.

6887. Would you like to make constructive suggestions to us as to what improvements could be made?—Yes. I think to get the best use out of my department and the Veterinary Department they should be under one control; whether they are under the control of the Director of Agriculture or the Minister of Agriculture is really immaterial.

6888. You think that there should be some over-riding authority over both departments?—Yes, for the simple reason that at the present time the Veterinary Department is under a Minister whose portfolio is totally different from that of the Minister of Agriculture, and that means there can be hardly any co-ordination at all. We are working together and whenever I want the help of the Veterinary Department they are always willing to give it, but there are times when their help is needed in a greater measure than they can provide at present. Owing to their system of having the Veterinary Assistants under the District Local Boards, it is very difficult for them to transfer a man from one particular District Local Board to another in an emergency. If the two departments are placed under one Minister that difficulty can be obviated very easily, I think.

6889. As regards the wider question of the co-ordination of the Heads of these departments, do you think that you are in sufficiently close touch with the Director of Agriculture?—I am. I am directly under the Director of Agriculture and I think my work is really in every sense just as important as that of the Veterinary Department. Since both these branches are equally allied to agriculture, it is my opinion that the direct control should be in the hands of the Director of Agriculture, because they are so interlaced with one another that the one cannot do without the other. If you take it in that light the Director of Agriculture is the right person to direct both departments, because you cannot expect a man with purely veterinary training to control the Agricultural Department. I think in every Province in India the Director of Agriculture is now a specialist officer. Under these conditions the Director of Agriculture has just as much knowledge of animal breeding as he has of veterinary science, and if he can control animal breeding efficiently he should be able to control the veterinary work efficiently.

6890. As regards the organisation of the Veterinary Service, have you a good deal of experience of the Veterinary Service in this Presidency?—No, I am afraid, I have not.

6891. I should have thought indirectly you would have?—I deal direct with the Superintendent of the Veterinary Department, but what his organisation actually is I do not know.

6892. Nor have you any experience, then, of the working of that organisation?—Except that I happen to know that the Veterinary Assistants in the districts are under the District Local Boards, and so there is dual control,

the Veterinary Superintendent controlling the men from one end and the Local Boards from the other.

6893. Is it your view that the high incidence of contagious disease amongst cattle in the Presidency is a serious bar to cattle improvement?—Yes, very serious.

6894. Would you develop that a little?—Yes. Really there are two main factors in the deterioration of cattle in this Presidency, famine and disease. After the cattle of a particular village or group of villages have passed through an outbreak of rinderpest, the 30 or 40 per cent. that may survive the attack are hopeless as breeding animals. That is my experience not only in the districts but on a Military farm also. When I was Manager of one of the Military dairy farms I had a herd of 1,700 cattle. We brought many animals through rinderpest and after we had got them through they were hopeless as breeding animals. There must be some form of legislation to prevent the spread of disease in India.

6895. What do you say about the Indian States in relation to such an Act?—I believe myself that in the Provinces we are all trying to do our best, but your question leads me to a matter which might arise later on another point; namely, the best is not got out of us owing to the fact that we really do not know what our neighbouring Provinces are doing in this particular line; and this equally applies to the diseases of cattle.

6896. In your day-to-day work you feel that the lack of co-ordination and co-relation of work between the different Provinces is a serious hindrance?—Yes. It means it is costing the different Provinces a lot more money than it really ought to.

6897. Reverting to my original question of the bearing of the high incidence of disease on the improvement of breeds, do you think it is true that a good many persons, relatively well-off, would be prepared to take an interest, and an active part, in the improvement of breeds if they were not deterred from doing so by the fact that they feel it is little use spending money on the improvement of cattle unless there is some security for the lives of the animals so improved?—I have not come across cases of that description.

6898. You do not think that is an important consideration?—I should not care to say. It has never been put to me at all in that way in my work in the districts since I have been here.

6899. Before leaving the question of the inter-relation of these departments, would you agree that hereditary and congenital characteristics are often important in relation to immunity or susceptibility to disease?—Yes, and that is one of the reasons why, in this Presidency, I am very much against the crossing of our indigenous breeds of cattle.

6900. You are against crossing?—Yes, with outside breeds of European or American cattle, because my contention is that at the present time one of the few qualities our Indian cattle possess, if not their only quality, is their immunity against disease, and by bringing in anything from outside we are going to lose the only quality we possess at the present time.

6901. Have you followed the history of the half-breeds in the Military farms?—I spent six years on a Military farm myself.

6902. It is a fact, I take it, that the first cross is an efficient animal so far as its yield of milk is concerned?—Yes.

6903. The best available in India?—The best available to-day, yes.

6904. What about the next cross?—It is hopeless.

6905. And the next cross again?—I do not think they have ever got to it.

6906. Do you think the half-bred farm makes any contribution towards the improvement of cattle in India?—No; in my opinion it is a hindrance, because the Military dairy farms have for the past 15 to 20 years been selling half-bred bull calves, or even heifers, into the districts. The cultivators, and even our city people, have heard that these animals give enormous quantities of milk, so they have purchased them and treated them in exactly the same way

as the ordinary village cattle. The result has been that when disease comes along the first animal to pick it up is the half-bred.

6907. That is why there are no third crosses?—I do not know that it is due to that; I think it is due to the fact they are so hopeless it is impossible to rear them.

6908. Regarded purely as milk-producing machines, could you give any indication of the comparative value of selected indigenous cows and the half-breeds to which you have referred?—Unfortunately the crossing of our Indian cattle with European and other breeds was started many years ago, and the improvement of our indigenous cattle has only recently been taken in hand, so that to-day half-bred cattle and country cattle cannot fairly be compared. On my farm I have the son and daughter of an animal which gave in her lactation period 10,000 lbs. in 293 days. If as much work had been done on Indian cattle in the last 25 years as has been done on the half-bred, I believe the former would now be in the same position as the latter.

6909. Not quite, because an important contribution towards the improvement of the cattle of the country would have been made?—Yes. I am only referring to milk yield. Had the Military dairy farms tried to improve the native cattle, they would have made a contribution towards the improvement of the cattle of the country, instead of the reverse.

6910. Is there general agreement with your views that the second cross-back to the indigenous animal is a failure?—I think this question was fairly well thrashed out at the last Board meeting I attended, and there everyone agreed they were useless. I think that opinion is almost universal.

6911. Do you know if any recognised expert traverses that view?—I think the Military dairy farm people, who have done it themselves, now admit they have failed.

6912. They have not failed, because they were not attempting to improve the breeds; their only concern was with the milk yield?—Yes.

6913. On this matter of breeding bulls, you have provided the Commission with copies of the old and the existing rules. Do you wish to suggest any change in the practice or the rules?—No, beyond mentioning a small change I am having to make at the present time. We are giving a premium bull to a particular person and not to a village or a society or anything like that. We hold one man responsible. In our old rules, after three years the bull became the property of that man, and that was an encouragement to him to take the bull. After we had worked according to the old rules for some time, I found that out of 100 bulls we put out in the Presidency we only got good results from 35, which is natural when you are working with the cattle we have in India; there is nothing very pure about them yet. In order, therefore, not to lose a good bull I might have put in a village, I altered that rule so that the bull, instead of becoming the property of the man, remains the property of Government the whole time. Government replaces that bull free of charge whenever required. That scheme costs the village no more and costs the Government no more; it is the person who actually takes the bull who feels the loss. Owing to this arrangement it became a little difficult to put out bulls in some areas, so that I have now rescinded the clause in question.

6914. How many premium bulls are there in the Presidency at this moment?—At this moment I have in the Presidency 168 premium bulls.

6915. One hundred and sixty-eight premium bulls at stud at this moment?—Yes.

6916. Has it been brought to your notice that the cultivators complain they have to pay more than the recognised fee when they take a cow to a premium bull?—It has never been brought to my notice at all.

6917. You know this country far better than I do. Would you be at all surprised if there were instances where a little bit more than the recognised fee is charged?—There is no fee at all; none whatsoever.

6918. I am thinking of cases where bulls are at stud for a fee. For premium bulls there is no fee at all?—No.

6919. Have you known cases of charges being made for premium bulls?—Yes, but they are absolutely voluntary from the person who has taken a cow to the bull. In one village in the Dharwar district, we happened to put out a really excellent bull. The bull was intended for the use of the village only, and people from the surrounding villages, whenever they came to have their cows served by this particular bull, gave a sort of donation to the village for the use of the bull, either in the form of 2 lbs. of *ghi* or 5 lbs. of concentrated food to be fed to the bull itself. It was for the bull; there was no fee.

6920. I am founding myself on what the Commission was told the other day by a group of villagers whom we examined. I was wrong, I suppose, when I was told of that, in thinking they referred to premium bulls. Probably it was a bull belonging to some one which he let out at a recognised fee. Is there any extortion on the part of persons in charge of these premium bulls?—None whatsoever.

6921. You have given the Commission a very interesting note* on the question of fodder and grazing. I do not know whether you wish to amplify that at all, or whether you think your note covers every point you wish to put forward?—As far as I know at present it covers everything. If there is anything wanting, I may be able to answer any questions that are put to me.

6922. On the question of the facilities for grazing in forests or grass-cutting in forests, do you wish to say anything more than you have said?—As far as cattle-breeding goes, I may assure you that the closing of forests and the so-called restrictions on grazing lands, in my opinion, have very, very little effect on the deterioration of the cattle, for there is ample fodder in our Presidency during the monsoons, both in the form of grass and in the form of the *juar* that is grown in the Presidency that, if properly conserved and used, would last the scarce months through quite easily. But unfortunately we have not yet got to the stage where we can show the people that this is possible. We are doing it now.

6923. You refer to non-fodder-famine years?—Yes, I am referring at the present moment to the usual year, the normal year.

6924. What about periods of fodder famine?—We are getting over that difficulty in the Bombay Presidency very rapidly. We have got a Famine Fodder Fund, which is operating very successfully in, I think at the present time, about five or six of our talukas and districts where famine occurs fairly frequently, by storing the local fodder grown.

6925. You say you are getting on rapidly. Do you look forward to the day when a fodder famine will no longer be a menace?—I hope so.

6926. I am sure you hope so, but do you think so?—I think so. As I say, we have ample fodder, if we can only get the people to conserve it. In our worst tract, in the Ahmednagar and Sholapur districts, in a good year there is as much fodder grown as will last those districts for two or three years, which is about our limit of famine years in succession.

6927. How about the practice of stall-feeding in this Presidency?—All bullocks and all cows that are useful, that are giving milk, are stall-fed, but I am sorry to say that it is a very, very small percentage of the cattle of the Presidency. Especially is that so with regard to the cow.

6928. Is stall-feeding more prevalent in some districts than in others?—Yes. In Gujarat stall-feeding is resorted to considerably, and similarly in the Dharwar district.

6929. How do you account for that?—It is simply due to the fact that the cattle of Gujarat give a fairly substantial return to the owner. The buffaloes are known milkers; they produce fairly substantial quantities of milk; they are economic animal and are fed. In the remainder of the Presidency the

* *Vide* Government of Bombay, Revenue Department, Resolution No. 3252, dated the 30th June, 1925.

animal is not economic and the people cannot afford to feed it; it is let loose in the morning and returns in the evening, finding what it can.

6930. In the matter of dairying, do you think that a dairy carried out according to the European ideas of hygiene and so on is an economic proposition in this Presidency at this moment?—It is, and it would be more so if there were better control and legislation over the milk that is sold in the country at large. I might give you an instance. We have a company that supplies milk to Bombay from a place about 2 hours' run out of Bombay itself. That institute has a depot in Bombay to which it sends its milk, and it is pasteurised and cooled. The remainder of the milk in Bombay is produced from buffaloes that are stall-fed in the city itself. There is the producer of milk, that is, the owner of the buffalo, who passes his milk on to a wholesale or retail vendor, who, as a matter of fact, has no recognised residence in Bombay at all. The Municipal authorities inspect the milk produced by this company, it may be twice or three or four times a week; but though the milk produced by this man who has no residence may be tested, the next day when they go to look for him, he is not to be found. Therefore, the competition is unfair, and we cannot possibly compete with the people in Bombay in supplying milk.

6931. Are you broadly familiar with the conditions in Great Britain?—Fairly familiar.

6932. If all the statutes and rules which in England control the sale of milk, its quality and cleanliness, were to be removed, and milk which was dirty were offered to the East End population at half the present price, side by side with milk which was clean at its present price, do you suppose they would take the clean milk?—I do not see why they should not. The trouble in India is that the Hindu population will buy adulterated milk, but they will not adulterate it themselves. If you go to any one of our market places in India where milk is sold you will find the man has a vessel of pure milk; alongside it he has a vessel of water, and he will sell you whatever grade of milk you want. You cannot teach these people to buy two ounces of pure milk, take it home, and add clean water to it, that is not permissible, apparently, in the Hindu religion; whereas they will buy adulterated milk in the city here.

That is what I really meant by my question.

6933. Clean milk, and sound rules of hygiene in its distribution, are things which are really imposed on the general public by the more progressive elements in the community, and if left to themselves, the humble members of the community will not worry about these things?—I think myself that if the adulterated and dirty milk were removed and clean milk were supplied at the same price, people would accept it.

6934. At the same price?—It can be done at the same price; I am producing milk cheaper at this little place outside Bombay than they can do in Bombay at any time.

6935. Do you mean to say that you can produce first class milk under first class conditions, and sell it as cheap as the milk is being sold to the working class population in Bombay to-day?—As cheap as good milk is sold, yes. The person selling milk in Bombay will tell you, "Here is pure milk; you can have it at six annas or eight annas a seer; I will add one glass of water to it, and you can have it at 4 annas a seer." If they took it at the pure price from us our dairies would pay and pay well.

6936. How much of the pure milk is bought, as compared with the deliberately watered milk?—I think that depends on the size of the family.

6937. It is really an important point. After all, if there is no demand for pure milk, your case for the production of pure milk as an economic proposition goes by the board, does it not?—The production of pure milk does not depend only on the production of the milk itself. There are other factors working with it that would go to show that it is essential in this country.

6938. What would they be?—First and foremost, these people that produce milk in a city bring their cattle down into the city. They milk them for

9 months or 12 months, or even up to 18 months. When they have finished the animal is done, and it goes to the slaughter-house. To prevent this great drain on the country, it is essential that we should produce milk in the district. By producing milk in the district we are going to save the cattle of the country, and at the same time produce clean milk.

6939. How do you suggest a start should be made?—By encouraging and subsidising the starting of dairy farms in the district.

6940. By subsidising?—Yes. Every other commodity in India that has to be produced and cannot stand on its own legs is subsidised, and I cannot see why dairies should not be subsidised as well.

6941. Have you anything to say about the manufacture of milk or dairy products? Could that be made an industry of this country?—Yes, it could be made a very flourishing and paying industry. Unfortunately it has got into the hands of a class of persons whom it is very difficult to eradicate to-day; it will take us years. India had at one time a very large export trade in butter, but it has lost that owing to the quality of the butter exported. Australia has captured the Ceylon market, to which we used to send quite a lot of butter; and similarly with Japan, and the Straits Settlements. Owing to the quality of the butter we produce in India to-day, we have lost that trade.

6942. That is not due to conditions in India?—Not at all. Good pure butter can be made in India as in any other part of the world, and I believe more cheaply. We produce butter in Gujarat during the greater part of the year for something like 11 to 12 annas a lb. It simply means that the material is there and it is only the methods of manufacture that have helped us to lose this trade that we had.

6943. Is there any Municipal system of health control in a great city like Bombay? Is milk which is exposed for sale tested at all?—There is control, but I am sorry to say that it is a control on paper; it does not function very well.

6944. It works on paper, but not on the milk?—Not on the product.

6945. Are tests taken of the milk exposed for sale?—Yes, they are, but, as I tried to explain to you to-day, the only man who suffers is the man who runs a scientific dairy. We are being prosecuted, whereas the man who adulterates is not. His name is taken, his milk is analysed, but to-morrow if a summons goes for him he is not to be found. He was under the name of "Ali Bux" yesterday, but to-morrow he will call himself by another name, and you can do nothing.

6946. Is the distribution made from door to door?—Yes, it is from door to door. In some cases there are shops that sell the milk and sell many other commodities at the same time.

6947. Would you suggest the registration of itinerant vendors?—Yes.

6948. Might that make an important contribution towards the improvement of the general position, which would act generally on dairying?—Yes, it would help us in improving our cattle in the country to-day. That is the point I wish to lay most stress on. It is not so much that there is shortage of milk, but there is a very big drain on our districts for cattle to produce milk for these large cities. The drain is really big, and I think that legislation of any description is going to help very little, unless it is to encourage and give the man producing milk in the mofussil a chance of competing with the local man.

6949. What do you say about the production of a dual purpose animal, a milking and working animal, as against the opposite line of advance?—The time is coming, I am afraid, when we shall have to pay very serious attention to producing a dual purpose animal, for the simple reason, as I pointed out in the note that I presented to you, that we have in the buffalo an animal which is probably one of the greatest hindrances to the improvement of cattle in this country. The female buffalo calf is attended to from the day it is born till the day it calves, and ever afterwards, and naturally, with that attention it has improved. Whereas, the female calf of the cow, from the

day is born till the day it dies, receives no attention whatsoever. From a milk-producing point of view, there is very little attention, and less attention every year, being paid to the cow, and the time must come when the same position will be reached as was reached with our shorthorn cattle at Home, when they went on breeding them till they bred the milk out of them. It is going to be exactly the same. If very extensive steps are not taken to remedy this, I fear in time the cattle of this country will be in a very sad way.

6950. You think things are going from bad to worse?—Yes. The buffalo is spreading. As they get their milk from the buffalo, they pay less attention to the cow. In certain parts of India they produce milk from cows, but they cannot sell it. Unless we take very serious measures, I am afraid the time will come when the cow population of this Presidency will be in a very sad way.

6951. *Sir Henry Lawrence*: Do you consider there is a sufficiency of plough bullocks in this Presidency?—There is a sufficiency of bullocks in the Bombay Presidency, but they are not produced in the Bombay Presidency.

6952. Where does the Presidency derive its supply from?—I tried to work out the figures for the Commission, but I have really had very little time in which to do it. I will give you the facts, though I cannot give you the figures. We have in the Presidency, as most of the members of the Commission have seen, about nine different breeds of cattle; they are all exhibited at the Agricultural Show. Over and above this, we have three breeds of cattle that are used extensively in several of our districts. These are the Malvi, the Nimari from the Central Provinces and the Amrit Mahal from Mysore State. All those animals that are in the Presidency to-day are not bred here at all. Every Malvi bullock that is seen in the Presidency has come from Central India Agencies or from the Central Provinces or from Rajputana. I tried hard to work out some sort of figures, but I believe myself that almost a quarter, if not a third, of the bullocks of the Bombay Presidency come from outside.

6953. What is, approximately, the cattle population of the Presidency? Have you got the figures?—The cattle population of the Bombay Presidency is 9·9 millions.

6954. Of that, what proportion do you regard as uneconomic or useless animals?—In my opinion, 75 per cent.

6955. *The Chairman*: Seventy-five per cent. are useful or useless?—Useless.

6956. *Dr. Hyder*: Is that due to their number?—Due to their quality.

6957. *Sir Thomas Middleton*: You mean uneconomic?—Uneconomic. Excuse me; I may be leading you astray. When I say uneconomic, I do not mean that 75 per cent. of the 9·9 million or 10 million cattle that we have in the Presidency are uneconomic. What I meant to say was that 75 per cent. of the cow population of the Bombay Presidency is uneconomic.

6958. *Sir Henry Lawrence*: Out of the 10 million would about half be cows?—No.

6959. What proportion?—Our cow population in the Bombay Presidency is just a little over 1½ millions.

6960. That is all females?—All females; cows, heifers, and so on, and our bullock population is about 3½ millions. We are importing about a third of our cattle. We have got 1½ million cows to produce 3½ million bullocks. As you know, the Indian cow calves for the first time in the vicinity of 6 years of age, and it calves till it is about 14 years of age, making a total of about 8 years; they calve, as a rule, once in 18 months or two years. In their lifetime, they produce from 4 to 5 calves, of which 50 per cent. may be taken as males and 50 per cent. females. If you take 25 per cent. of these as casualties, you will find that we are producing only about two-thirds of our requirements in the Presidency. We have only got to material for the production of two-thirds of the bullock power that is necessary in the Presidency.

6961. One and a half million cows produce how many bullocks in a year?—They produce once in every 18 months or 2 years. They produce half that number; that is half of $1\frac{1}{2}$ millions.

6962. They produce about 600,000 a year?—Yes, roughly.

6963. That would be their total progeny in a year?—Yes; 25 per cent. of those die before they reach maturity.

6964. What would you estimate as the annual requirements of the Presidency in bullocks?—I am afraid I have not been able to work out that figure. I really do not know what the annual requirements are. I have here worked out that in 1920 the requirements of bullocks in the Bombay Presidency were 3,695,852.

6965. Thirty-six lakhs were required for the cultivation of all the cultivated area in the Bombay Presidency?—Yes.

6966. What life do you give to a working bullock?—We might take it that the working bullock matures in India at the age of $4\frac{1}{2}$ or 5 years; his total period of efficient working will not be beyond 12 years of age, that is to say, 7 years' work.

6967. If you divide that figure of 36 lakhs by 7, your annual requirements are 500,000?—Yes, I take it that would be correct.

6968. That figure of 7 years allows for deaths and other casualties?—No, I am not allowing for casualties.

6969. Making that allowance would you put it at 5 years?—It is hard to estimate in working years like that. Probably, it would be about 5 years, allowing for casualties.

6970. In that case, you require about 7 lakhs of bullocks per annum?—Yes.

6971. The local cows produce nearly that quantity; that is your estimate?—Yes.

6972. You have at stud about 160 premium bulls?—Yes.

6973. Are there other bulls possessed by District Local Boards put out to stud?—No, all stud bulls are put out by my department.

6974. The total number of bulls that Government, in any shape or form, produces for the improvement of the stock is your 160?—That is the number actually in use to-day. They are shifted after every three years from a particular village.

6975. Do you look forward to any fixed time within which you may be able to make any appreciable improvement in the cattle population?—No, I am afraid I cannot estimate any figure like that, because the conditions vary so, and one never knows. If we had good years every year we might be able to give you an estimate; but with famines and diseases cropping up it is really impossible to give any figure at all.

6976. Your operations with regard to premium bulls will have to be multiplied manifold before you can really do much good to the total cattle population?—Quite so.

6977. You would not like to give us any figures?—No, I cannot give you any figures. I may tell you that this is a very expensive proposition; when I am able to prove to my Government that this is a sound proposition I may get more assistance and more funds for this purpose.

6978. But you are satisfied that your 160 bulls are doing good service?—I am quite satisfied that at the present time they are doing very good service. It is a very difficult thing to gauge the result in rupees. A calf may be born to a cow owned by a man who may be in straitened circumstances; he may sell the cow and the calf and they go out of that district altogether; but we are at the present moment in the Bombay Presidency getting Rs. 20 or Rs. 30 more for a calf produced from one of my premium bulls than is paid for the ordinary cattle in the district.

6979. You regard yourself as at the very beginning of a very important improvement for the benefit of the ryot?—Yes, I think it is really very important.

6980. Do you wish to concentrate on one purpose or the other or do you think it better to produce a good serviceable dual purpose animal?—It all depends where we are working; we are trying to breed more milk into our draught breeds indigenous to a particular tract. In Gujarat we have bred milk into an animal which a few years ago was a purely draught animal. Unless we can produce an animal that will give more milk, that will calve more regularly and will mature at half the age, at the present time it must be uneconomical, and no man is going to keep an animal that is uneconomical. It is our duty at the present moment to produce an animal which will not be a burden on the cultivator; when we have reached that stage, the cattle problem of this Province will not be difficult. Until that is done, it is going to be a very serious uphill climb.

6981. How long have you been in the service of the Government of Bombay?—Since, 1919; but I have been breeding cattle in the Bombay Presidency since 1914.

6982. Have you got out any pamphlet or bulletin to suggest to Local Bodies the proper principles of animal-breeding?—We have issued certain information in the way of leaflets, but not on a very extensive scale. At the present time, although I have spent six years in the Bombay Government, I feel that there is a good deal more to learn on this particular question than I have been able to pick up in these six years, and I think it would be rather dangerous for me to go round to any particular person and tell him to do so and so in his particular locality, because I have really not had sufficient experience, and I do not believe there are many people in India who could or would attempt to give you a definite view on this particular point.

6983. Have you any Indian staff working with you?—I have myself three men for the whole of the Bombay Presidency.

6984. Three officers, of what standard?—Three men who are drawing at the present time about Rs. 115 a month.

6985. Are they from the Agricultural College or the Veterinary College?—I have two from the Agricultural College and one from the Veterinary College; that is my district staff. Then I have my farm Managers as well; I have three farms and I have Managers in them.

6986. So that to make any real impression on District Local Boards and get them interested, you require some more men to do propandanda work?—Yes, a good deal; I hope the time will come when the Bombay Government will consider this seriously and give me a bigger staff.

6987. Have you yet made any proposals to the Bombay Government?—Yes, we are making proposals very frequently during the year. I got a letter in only to-day with reference to starting another farm and gradually I suppose we shall be able to get what we think is required.

6988. So far the importance of your work has not been recognised in your opinion?—Yes, in my opinion it has not been recognised.

6989. *Sir Ganga Ram*: What price has the cultivator to pay for a pair of bullocks ready for the plough from your institution?—I do not sell bullocks.

6990. What does it cost you?—I do not produce bullocks.

6991. *Sir Thomas Middleton*: Where are your headquarters?—Poona.

6992. Have you visited all parts of the Presidency?—Yes.

6993. Would you care to name three or four districts where the cattle are distinctly above the average for the Presidency, and similarly three or four where they are distinctly below the average?—Yes. We have excellent cattle in Sind, in Gujarat and in Dharwar, and very fair cattle in Satara. The districts which have very poor cattle are Poona, Nasik, Khandesh, Bijapur and Sholapur, and our worst cattle are in Konkan, Karwar and Ratnagiri.

6994. Are there obvious reasons for these differences?—In the Dharwar district the people breed and look after a very fine type of cattle. In Gujarat the buffalo is what it is to-day because the people there have been able to regulate breeding owing to the fencing that exists there.

6995. You told us that the cattle in Dharwar and the buffaloes in Gujarat were very fine, and therefore the people were taking care of them?—Yes.

6996. I put it to a previous witness this morning that the cattle had been taken care of, and that therefore they were valuable?—Quite right.

6997. Which comes first, the care or the value?—The point is the cattle are valuable because they have been taken care of and they have been able to regulate their breeding, with the result that they have the good cattle which they care for to-day.

6998. I attributed quality in the case of Gujarat cattle to the enclosures you have just mentioned?—Our cattle in Gujarat are at present produced by the Rabari, who goes from place to place. Enclosure has little or no effect on him, but he knows the value of a bull and he selects a bull which he keeps, and no other male stock are allowed anywhere near his cattle.

6999. You have shown in your memorandum that the Rabaris did their work well in the past?—Yes.

7000. But I gather from your memorandum that their practices are deteriorating?—Yes.

7001. And that they are not now so efficient?—No, owing to the fact that the trade is also deteriorating and their movements are restricted.

7002. From your memorandum I gather that in the period which I can recollect (30 to 35 years) the cow, as distinct from the bullock, in Gujarat has suffered badly in competition with the buffalo? That was beginning when I first knew the country?—Yes, that is so.

7003. Reference has been made to second crosses. What exactly do you mean by a second cross?—We have found the second cross is nothing like the first cross. It deteriorates in stature, physique and milk yield. A first cross is where we put an Ayrshire bull, say, on a country cow. The Ayrshire bull put on the calf of that first cross gives the second cross.

7004. Often called the three parts bred?—Practically.

7005. Is it the influence of the second cross itself which is detrimental, or the fact that you have an animal much more nearly resembling the breed from which the bull comes, and entirely unsuited constitutionally to the climate and conditions of this country? What is it that makes the animal so useless?—I think the lot of different things are brought to bear on it. For one thing, the second cross is physically unfit to thrive in this country. It is not because it resembles the Ayrshire more, because pure Ayrshires brought out here have thrived to a certain extent; there are cattle brought in by almost every ship that brings horses to Bombay and Madras, and those cattle thrive.

7006. Crossing tends to find out weaknesses?—Yes.

7007. I was interested to hear you say that in your opinion ample supplies of fodder were available in the Presidency. I should have thought that at any rate in the Deccan and some other districts of the Presidency there could not be ample supplies?—It is my opinion that though there may be one or two talukas (and I could name you one or two) where there is not enough, yet they are not the Presidency, and in the Presidency as a whole there is grass in abundance in the monsoon period. If people would only conserve it and make hay and silage of it there would be ample for one, two or even three years.

7008. Your point is that the grass exists in the reserves in the forests?—Yes, and in the grass lands adjoining our villages.

7009. We are well aware that there is a vast amount of grass grown in the forests, but the evidence we had the other day was that there were only 500,000 tons in the reserve accumulated by the Forest Department?—Yes, but it is not that grass I allude to at all; it is the grass in the locality. For instance, here in Poona we have hills all round. In Khandesh we have the Satpuras with miles and miles of grass land. The Forest Department has given the people every right and facility to get grass from the forests

at 4 annas a cart, and they have only to go 16 or 17 miles to get it; and if they wanted to conserve it they could.

7010. They have to cut it for themselves?—Yes.

7011. Are they able to undertake that work in addition to the cultivation they have to carry on?—That is the great drawback, that both these functions come at the same time; but I think it could be overcome. Silage-making, for instance, is done at a time of the year when there is no other work possible, when the monsoon is on. The crops are growing and the people are idle; they could set to work to make silage.

7012. The difficulty about silage is the heavy cost of carting it any distance?—You cannot expect people to cart green fodder 30 or 40 miles, but people should certainly be able to cart green fodder 2 miles to make silage; and where we have no grass we have an ample supply of *juari*. In Dharwar there is very little grass, but there is sufficient *juari* to justify Government opening a shredding and baling plant and purchasing fodder to keep as a reserve against famine for other districts.

7013. With regard to the number of calves in this Presidency, you have here 2,700,000 cows. These cows calve on an average once in 18 months, but, assuming they calve at two-year intervals, the number of calves born would be about 1,350,000?—Yes. My figures show that we have 1,062,000.

7014. *The Chairman*: The first calf is at 6 years old?—Yes, and our improved stock in India calve at 4½ or 5 years. I should not care to say when the ordinary village cow calves.

7015. What proportion of the females shown in that list would be under 6, and what over?—It would be very difficult to say. You would have to take it as about 50 per cent.

7016. *Sir Thomas Middleton*: The figure given here refers to cows 5 years old and upwards?—I think you cannot possibly base it on that figure. I have seen census reports. A man will call a bullock working in the fields a bull because it is entire. You may have a heifer 6 years old, and because it looks like a cow it is put down as a cow; but if it has not calved it is not a cow but a heifer.

7017. This figure of 2,700,000 given in the Bombay memorandum; what number do you think it represents of cows?—I should not care to say, but I do not think it represents all cows. It most probably includes buffaloes. My figure is 1,062,000, or about half of what you have mentioned. The buffalo population is about another million, which makes it correct.

7018. I did not know that the figure in the memorandum included buffaloes?—Yes; I am fairly sure my figure is correct.

7019. You talk of butter selling in Gujarat at 11d. a pound. That includes buffalo butter?—It is practically only buffalo butter.

7020. *Dr. Hyder*: Your purpose here in this Presidency is to evolve a dual purpose breed; is that not so?—Not exactly. We are trying to evolve a dual purpose animal, in that we are trying to get our present draught breeds to give more milk than they do.

7021. I find from your note that the buffalo is in close competition with the cow so far as milk is concerned?—It is in competition with the improvement of our cows; that is the point.

7022. How do you get over the buffalo difficulty when you are face to face with the problem of a dual purpose breed?—The point is that all we are trying to do is to produce an animal which will be more economical for the cultivator to keep in good condition. If we do that, and he knows the progeny from that cow will give him more milk to support his family, and will at the same time give him a good draught animal, he will breed that and leave the buffalo alone. The buffalo has no place whatsoever in the home of a cultivator. He cannot afford to feed two mouths to produce two animals which are required for two different purposes.

7023. Do you think the cattle population of this Presidency is beyond its fodder resources?—No. My opinion is the fodder resources of the Presidency are ample, but the cattle in the districts are so poor (as I have said, 75 per cent. of the cattle of the Presidency are probably uneconomic) that a man will not stir or spend 4 annas to bring a cartload of grass to feed them, because he knows they are of no use to him. If they can find sufficient food to keep themselves alive, let them; if it is not to be had they do not get it, and when they get so lean they can hardly walk and they are taken by the butchers.

7024. Are these hills round Poona to which you refer under the control of the Forest Department?—Yes.

7025. Whether they are covered with trees or not? The majority of them are bare.—We have three or four different sorts of grass land. We have grass land under the Forest Department; we have revenue waste land under the Revenue Department, and there are other lands which produce very little else but grass under the Forest Department.

7026. You said the dairy industry in Gujarat was not a success?—The organised dairy industry in Gujarat is not a success, but the dairy trade as it is, is a very profitable thing to Gujarat.

7027. I imagine the products of that industry are milk and butter?—Yes, and a certain amount of *ghi*.

7028. The home demand in this Presidency is chiefly in the form of butter or *ghi*?—The demand for *ghi* is greater than for butter.

7029. Do you think if the dairy industry in Gujarat devoted itself to *ghi* rather than butter it would find a profitable market?—No; a man makes most money when he sells his produce as near to milk as possible. If he can get a fair price for it as milk it is more profitable to him to sell it as milk. Next comes cream. The cultivator can make more money on cream than on butter, and so it goes on until you get to *ghi*, which is the least paying of any one of the four steps in the milk trade.

7030. The rise in the price of *ghi* has not been so great as the rise in the price of milk?—For the quality of *ghi* the villager would turn out from his butter he would not get the price he should do; he realises a better price if he sells it as butter.

7031. You mentioned some figures with regard to the annual requirements in the way of bullock-power: I think you said 31 lakhs. How many acres do you allow to a pair of bullocks?—We have taken the Presidency as a whole. These figures I am giving you are from the Report of the Cattle Committee that was appointed by the Government of Bombay four years ago. I have not had time to get out anything more recent.

7032. *The Chairman*: What year was that?—It was published in 1923. That is not the little note I have given you; I wrote that the other day.

7033. *Dr. Hyder*: Are these figures from the Report of the Cattle Committee figures which result from an enumeration of the cattle, or are they based on the total area cropped divided by the acreage you would allow to a pair of bullocks?—As a matter of fact, for our purpose I have taken here as an average throughout the Presidency about 15 acres per pair of bullocks.

7034. You know the total area cropped, and by dividing it by 15 you get at your bullock requirements?—Yes. If we take as an average that one pair of bullocks will plough and cultivate 15 acres of land, taking the Presidency as a whole we would require 36,95,852 bullocks; not pairs, but bullocks. That was in 1919-20.

7035. With regard to subsidised milk, you know that India is an agricultural country?—Yes.

7036. Therefore to require State-aid for the production of milk is peculiar?—The point is that the dairy and cattle-breeding industries have been

neglected for so many years that the improvement of crops has outstripped them considerably, and the cow and the buffalo to-day cannot compete with other agricultural pursuits. They cannot compete with cotton, for instance. Yet it is absolutely essential to this country that we should have milk and that we should have cattle, and therefore it is now up to Government to give the State-aid it gave to cotton and iron and other things and bring this on a level with other schemes.

7037. Land produces many things. It can produce cotton, wheat, sugarcane, grass, cows, milk. The fact that so much of the land is devoted to these other crops which are more profitable shows that the dairy industry is not profitable?—Yes.

7038. You would require to support it by means of a subsidy from Government?—Yes, until it becomes equal to and can compete with the other crops of this country.

7039. *Sir Chunilal Mehta*: You said there was ample grass of fodder of other kinds available for the cattle population of this Presidency?—Yes.

7040. The grass requires cutting at a particular time?—Yes.

7041. Is that possible?—I think so.

7042. Take the Khandesh forest, which has the largest amount of grass. How do you expect the cultivator to cut at a time when his crops also require attention?—I expect there is a little difficulty in that, but he could make silage.

7043. So far there is no indication that silage will be popular?—I should not care to say that. We have not spread ourselves sufficiently over the Presidency to say it is not popular or that the people will not take to it.

7044. The Agricultural Department has been advocating silage for the last few years?—Ever since I have been with the department, yes.

7045. Yet people are not taking to it?—That is so.

7046. There must be some reason?—It is like everything new that is brought into the country and forced on the people like that. They will have to study it for a season or two before they will take to it. That happens whenever you introduced anything new into the country. I think the time we have devoted to it has not really been enough.

7047. Have you found out the reasons why people do not take to silage? Is there any particular difficulty?—We are demonstrating it now, and the people say the cattle will not eat it and do not like the smell. If we got at the people for a succession of years and showed them that the cattle did eat it and that it was useful they would use it. In Nasik the Department of Agriculture built a silo tower which was taken over by a private person in the Nasik district, and to-day he makes and sells silage in the same way that other people make hay and sell it. If it succeeds there, why should not it do so elsewhere?

7048. Do you consider the Navapur grass would make good silage?—I think so.

7049. Has not there been a complaint that that grass is unfit for cattle unless it is cut at a particular time?—That is true, and it applies to practically all the grasses in the Bombay Presidency. Our grasses are cut too late. Moreover, especially in Navapur, where the forests are heavy, in an 80-lb. bale of grass you will most probably find 10 lbs. of leaves and sticks. The people are prejudiced. We have found in Khandesh that the grass there, cut at the time of year when it is usually cut, is of very little use to us during our famines.

7050. In good years there is a surplus of *kadbi* in those areas where *juari* is largely grown?—Yes.

7051. You say the cultivator should take this and make it available in subsequent years?—Yes.

7052. Why is not that being done?—Because the poor man does not know any better. He gets his fodder and stores it for a little while, and then some broker comes along and produces Rs. 100 and offers to buy his grass and he sells it.

7053. Is that the only difficulty, or have you found that the cultivators are afraid to stack it because of the risk of fire?—That is quite true. In North Gujarat we have tried to get the people to stack *juari* fodder, and they are afraid, because they think people may set fire to their *juari* owing to the damage their cattle have done to the crops while they were growing. That is an established thing in Gujarat.

7054. And there is some truth in it?—There is.

7055. Attempts have been made in the past to get the people to go in for communal storage of *kadbi*?—I do not know about the rest of the Presidency, but that is so in the Dharwar district.

7056. Yet the whole thing has come to nothing?—I think it will take a little time.

7057. You still hope it will be possible?—I have every hope.

7058. From what you say I gather the buffalo is really destroying the cow; that is what it amounts to?—Yes.

7059. The population of this Presidency has a preference for buffalo milk?—Yes.

7060. And for *ghi* made from it?—Yes.

7061. Do you think measures should be taken to get over this difficulty?—Not to stop the buffalo, but to pay more money for and spend more attention on improving the cow to make it as useful as the buffalo. I still maintain the buffalo is essential for our dairy, *ghi* and butter trade, but that is from a commercial point of view only. I say the buffalo has no place with the cultivator.

7062. *The Raja of Parlakimedi*: In this district, do you mean?—In every district.

7063. *Sir Ganga Ram*: Do you not use buffaloes for ploughing?—To a certain extent, in the rice tracts; but we have a breed of cow we have proved to be better than the buffalo in every respect for wet cultivation and ploughing, our Dangi.

7064. *Sir Chunilal Mehta*: Is the Dangi bullock now being used in Konkan?—Yes.

7065. Is it displacing the buffalo?—No. It has been in competition with the buffalo all through. Why the buffalo has a hold there is because you can buy a male animal for Rs. 15, whereas the cow would cost Rs. 75 to Rs. 80. (The poorer class of rice cultivator still keeps and uses the buffalo bull.

7066. What steps do you desire either Government or the people to take to meet this competition of the buffalo?—By improving and breeding and caring for the cows more than they do at the present time.

7067. Have you any hope of altering the taste of the people for buffalo milk?—I think the time will come, but as I have already mentioned the buffalo will always be there for the milk-supply of towns and larger villages, though circumstances will make the cultivator utilise the milk of his cow, as indeed he does to-day. If a cultivator has a cow which gives 4 to 6 lbs. of milk over and above what her calf requires he consumes it; he does not go to the bazaar and buy buffalo milk.

7068. You consider a time will come when the buffalo will only supply the milk requirements of cities?—And the *ghi* requirements of the country. What I want to impress on the Commission is that our cattle in India at the present time do not give any milk at all. The cow is used at present to produce a male animal. For a cow to produce a male animal a man has to keep it for six years, and in the sixth year it may produce a female calf which will be no use to him, so he will have to go on for two years more.

It may be nine years before it produces a bullock, and it will be five or seven years at least before that bullock is useful. Therefore he keeps one animal 14 years to produce a bullock, and during that time gets nothing back from that cow at all. I say the cow must give milk, so as to become an economic proposition.

7069. I quite agree; the whole object is to make the cow an economic proposition?—Yes.

7070. How do you propose to do that?—By improvements in our breeding methods, by producing premium bulls from our Government farms and other institutions where we hope to get help.

7071. What subsidy do you require from Government for this purpose?—It all depends upon the amount of work which is going to be undertaken by an individual; but I think the subsidy should cover his losses for at least three years.

7072. Whose losses?—The losses of the person who has undertaken to produce the cattle or start the dairy or whatever it may be.

7073. Then your plan of campaign would be to multiply the number of premium bulls as much as ever you can?—Yes.

7074. You have got 168 now?—Yes.

7075. Are you limited by finance in putting out more bulls?—My finance is limited.

7076. Are you limited by the difficulty of getting bulls?—I am limited by finance and I am limited by the difficulty in getting bulls.

7077. So that if you had all the finance you wanted?—At the present moment I could not buy the bulls.

7078. You could not use that money?—No.

7079. Therefore your present plan is to increase the number of breeding bulls?—Yes.

7080. And that you are doing not only by breeding them on Government farms, but by making arrangements with private institutions like *gorakshans* and *pinjrapoles* to breed on scientific lines under your supervision?—Yes.

7081. To breed bulls which you undertake to buy and put out in the country?—Yes.

7082. That would be your plan of meeting this difficulty?—Yes.

7083. What more assistance do you require from Government?—The point is that if all these institutions started and worked as we wanted them to work, and if we filled the deficiency by starting farms where no such institution existed, and produced the bulls, that is all that is really wanted at the present time as far as bull production is concerned. We want institutions and places where we can produce the required pedigree bull to improve the cattle of the country.

7084. You suggested that subsidies might be given to dairies. What is your idea with regard to that?—The point is that to start a dairy in India at all, it must be started with at least 20 or 30 buffaloes or cows as the case may be. To purchase 20 or 30 animals in the first year of starting a concern is a very difficult matter; in those 30 animals you may buy 15 animals that have paid their way, and you may buy 15 animals that have not paid their way. For that reason it takes a man at least three or four years to get a herd together of sufficient size to be self-supporting. During that period in my opinion he must be subsidised, because he cannot possibly do it otherwise.

7085. What co-ordination have you now with the Military dairy farms?—None whatever.

7086. What would you suggest?—The Military dairy farms are working in our midst in our Province, and my contention is that they should not only produce milk for the Military but they should be producing an animal that is useful for our district, and it should be one of the best media

for the production of first class animals. I think this Commission should lay a great deal of stress on that particular point, because while these people are here no doubt to produce milk for their troops, at the same time they should be assisting the districts in which they are located. Here, as I tried to point out to you, they use half-bred animals, and instead of being a source of help to the Bombay Government, they are a nuisance to us, sending out into the villages half-bred animals which are really dangerous to our cattle.

7087. Are you in frequent touch with the Expert of the Imperial Institute?
—Very frequent.

7088. I suppose the Military farms would be beyond the scope of his authority?—Yes.

7089. You said there was not enough co-ordination with the other Provinces?—Yes.

7090. In what way do you suggest there should be co-ordination?—I think it would really be met by having a sort of committee that would function in each Province; that would not be isolated or placed in Simla or Pusa with an office, but it would function in each Province; that is, it would do useful work in each of the Provinces. It would be in a position to make recommendations. We will take for instance the United Provinces. We have a very fine type of animal which I believe would meet their requirements in a particular locality, and I recommend that they get these animals and breed them in their Province, or get the Bombay Presidency to produce bulls for them. By doing that they would save the Bombay Presidency at the present moment the starting of three farms for producing Malvi cattle which we are using extensively in the Panch Mahals, in parts of Khandesh and parts of Lower Gujarat. If we had some sort of co-operation with an original farm where these cattle come from, we could breed our cattle in the Provinces where they are now using the Malvi, at a great deal less cost than the establishment of a farm would entail.

7091. Have not your meetings with the Board of Agriculture been of any assistance to you?—None at all. If it is going to have meetings which are anything like the meetings of the Board of Agriculture, I think I would rather do without it; we want a more virile body of people who will move round the country and advise and be useful to each Province in turn. If it is going to be isolated so that you have to write letters and receive answers to letters, I would rather do without it.

7092. Have you noticed in any part of the Presidency the cow used for any purpose except for milking and breeding?—In the Mysore State they actually use them in the plough, and the cow is used as a beast of burden for carrying produce by a certain class of trader.

7093. Do you think the tendency to use the cow for the plough is on the increase?—I should not care to say.

7094. It is only just beginning, is it?—No, I think it is an old established practice in Mysore State, but I should not like to say the practice is increasing.

7095. Has that been tried in the Punjab?—I could not tell you. That is an instance of how this committee I have suggested would be of immense help to us.

7096. You have a bull at Manjri, have you not? Is Manjri in your charge?—No.

7097. You have nothing to do with Manjri?—No.

7098. *The Chairman:* In answer to a question put to you by one of my colleagues a short time ago you spoke of the possibility of the issue of some manual of instruction. I think you ought to know that Dr. Mann, in answer to a question put to him by Sir Henry Lawrence which ran, "Have you issued any manual on cattle-breeding to indicate to cattle-owners the proper principles for the improvement of their cattle?", said: "I have

a bulletin of that kind which has just been drawn up by Mr. Bruen in my office; we have not issued one, but it is ready for issue?"—I was asked if I had issued any and I said 'No.' It is ready for issue; it is in the press; it is in the College to-day, but only to-day.

7099. I thought you would wish to know that?—I was asked if I had done anything up to the present, and I have not. It is only going out now.

7100. *The Raja of Parlakimedi*: Have you any buffalo-breeding stations at all in the Bombay Presidency?—We have, at our College of Agriculture; they are doing a little buffalo-breeding, and we have one place in Sind at Sukkur.

7101. Is it by selection, or what?—At the present time by selection and breeding from pedigrees.

7102. Is it entirely to improve the milking strain?—Entirely to improve the milk production.

7103. The percentage of butter in buffalo milk is greater than in cow's milk, is it not?—Yes.

7104. And India is a very large butter-eating country?—Yes.

7105. Would you not encourage buffalo-breeding stations?—As I have said before, as a commercial proposition buffalo keeping may be encouraged, but that is not our business. Our business at the present moment is to improve the agriculture of the country by improving the cattle. My contention is that for the cultivator we must produce an economical animal. The cultivator cannot afford to feed a buffalo and a cow for two different purposes, so that we must give him an animal which, though its milk will be a little poorer in fat, will give him a little extra milk which will help him to keep his family as they should be kept. I do not for a moment say we ought to condemn the buffalo and slaughter it.

7106. In the Bombay Presidency is not the buffalo used for rice cultivation?—Yes, but to a very small extent. We have a breed called Dangi which is infinitely better than the buffalo.

7107. They are not even used for draught purposes?—Very little in the Bombay Presidency, except in the Konkan.

7108. Are the stall-fed animals as healthy as animals allowed to graze in proper grazing grounds?—It is very difficult for me to answer that question. Cattle brought up on good pastures do infinitely better than cattle that are stall-fed; but I am afraid there are no good pastures in India.

7109. What would you substitute to make up for the deficiency in stall-fed animals? Exercise is essential, is it not?—Yes.

7110. And a stall-fed animal must suffer from want of exercise?—No, it gets its exercise. An animal when it is outgrazing gets a certain amount of food, but it does not get sufficient food in India not to be stall-fed. By stall-feeding I do not mean that the animal is tied by the neck to its trough for 24 hours in the day, but I say stall-feeding is essential to supplement the poor grazing in this country.

7111. What is the best fodder for milk-giving cattle in this Presidency?—A green fodder such as *juari*.

7112. Lucerne?—I am afraid that is one of the things we lack in our Presidency. We have no institute in which we could experiment to find out which of these fodders is the best, but judging from yields it most probably is the best. The Indian, as you know, has a prejudice against feeding lucerne, because he thinks it has a bad effect on his animals; he thinks it makes a milk animal go dry, and it is very difficult to introduce it in this country.

7113. If that is so, it is peculiar to the Bombay Presidency; it is not so in other parts of India?—I am only talking of Bombay.

7114. Have you any statistics as to cattle fed on cotton seed and ground-rut cake?—No.

7115. Are they equally good?—As far as we know. We can tell you from the analysis which is better, but the analysis is apt to be misleading.

In our Presidency we have not up to the present carried out any extensive feeding experiments, and whether our cattle digest the one as easily as the other I am not in a position to say at present.

7116. *Sir James MacKenna*: You have given some answers to the Chairman and to other Members on the question of organisation. I understand you consider that Agricultural, Veterinary and Cattle-breeding should all be under the same Minister. Under whom do you work as Cattle-breeding Expert?—I work under the Director of Agriculture.

7117. Do you think cattle-breeding should be under the Agricultural or the Veterinary Department?—Under the Agricultural Department, certainly.

7118. That is your firm conviction?—Absolutely.

7119. Is any training in the principles of cattle-breeding and dairying given at the Poona Agricultural College?—Yes.

7120. Who gives it?—The Professor of Agriculture and his staff.

7121. Have you anything to do with that?—Nothing.

7122. That seems to suggest a certain lack of co-ordination, does it not?—It means that I am fully occupied in the district and I have not got the time to devote to the College.

7123. On the general question of training in cattle-breeding and dairy work, do you think that subject should be taken up centrally by the Government of India, or should it be left to each Province to develop on its own lines?—I am of the opinion that each Province can do its own work quite well, but that there should be some way of co-ordinating one Province with another so that each Province can help its next-door neighbour. I think I have answered that question already twice.

7124. Yes, you have. So that you are not in favour of the centralisation of training in the principles of cattle-breeding and dairying under the Central Government?—I might tell you that one of my opinions as to agricultural education in India is that the people do not get sufficient practical training.

7125. But that hardly answers my question?—And I am very much in favour of any institution that gives more practical training than our Agricultural Colleges give at the present time. Our college here is an Agricultural College; dairy training is only a side line. I think that an institute that furthers the teaching of dairy farming as is done in Bangalore should be encouraged.

7126. My point is that the essential principles of cattle-breeding are of general application?—Yes.

7127. And it might be economical of money and men to have it centralised instead of having each Province playing with it, which is all they are really doing now?—At the present time, since the Provinces are not equipped with as good institutions as that possessed by the Government of India, it may be we ought to take advantage of the Government of India institutions; but if our Province were equally equipped and we were staffed as well, I do not see any reason why we should not do the teaching here.

7128. You made some rather severe criticisms of the Board of Agriculture; did you attend the meeting of the Board of Agriculture at Pusa last December?—I did not.

7129. The subject of cattle-breeding was discussed then?—Yes. I did not criticise the Board of Agriculture.

7130. Then I must have misunderstood you?—I was speaking of the action taken with regard to cattle-breeding; that the Board of Agriculture being the body that it is, not only the Provincial Governments but the Central Government have taken very little notice of what that body said or did.

7131. One of the recommendations of that Board was that an All-India Cattle Committee should be appointed; do you approve of that recommenda-

tion?—I have made mention of that twice already to-day; I advocate it very much.

7132. I am putting it definitely in the terms in which it was passed by the Board; do you approve of that?—I do, yes.

7133. We have had rather a central organisation put before us. I think the officer who brought the idea before us called it a central organisation for research or an advisory council. I suppose if such a central agricultural advisory agency came into being, the All-India Cattle Committee which you suggest might work under it as a Cattle Sub-Committee?—Yes, to co-ordinate the work in one Province with that in another and to advise; as an advisory body I would welcome it.

7134. That is exactly the idea, you would have provincial representation on the Cattle Committee?—Yes, I agree, as I say again, on the condition that it is a functioning body, that it moves and meets and does some work in each Province.

7135. Do you think enough research work has been done on animal nutrition questions?—No.

7136. You said something about the Military dairy farms, and the general impression that might be drawn from your evidence is that you look with considerable disfavour on them?—I do.

7137. But I put it to you that at the time these farms were initiated the main problem was the immediate supply of suitable milk for the troops?—Yes, I agree with that.

7138. Do you not agree that in those circumstances the line they took for increasing that milk-supply by the introduction of foreign breeds of cattle was the only line that was possible?—Probably at that particular time the only thing they could do was to cross with cattle from Europe or America. That is probably the quickest way of getting milk, but it is not the quickest way of improving the cattle of the country.

7139. No, but that was not their problem?—No. I may mention that the Military have a farm at Ferozepore; all their cattle at that particular farm are indigenous Montgomery cattle, and most probably that farm pays them better than the farms on which they have half-bred cattle. If they had done that in these other Provinces with the indigenous cattle you can imagine the amount of good they would have done to the country to-day.

7140. That is the line along which you would recommend them to develop?—Yes.

7141. You think they ought to abandon the cross-breds, or at least, not sell the cross-breds?—They should keep them to themselves and not pass them around the country indiscriminately. They usually sell an animal which is no use to them; it comes into our districts and most probably is useful for about 3 months; after that it harbours disease which as soon as it gets run down, it spreads to all the other cattle we have in the vicinity.

7142. *Professor Gangulee*: Do I understand that you do not take any part in the teaching of animal husbandry in the Agricultural College?—I do not.

7143. You leave that entirely in the hands of the Professor of Agriculture?—The Professor of Agriculture and his staff.

7144. Has he had any training in this matter?—Yes, he is a man trained in England.

7145. Do you carry on any research on livestock breeding or on fodder and animal nutrition?—Yes, I do a certain amount on my farms; I am experimenting on different things in my farms to-day, but it is only very, very rough research, if you can call it research. We are trying to find out what we can; I have no laboratory, I have no institution under me where I can do research work.

7146. And you do not publish the results of your findings?—Yes, they are published.

7147. Of your own research?—As I tell you, I have no research.

7148. Experiments?—Only certain experiments which I have published; they have been published in the Journals at Pusa and they have been published in our Presidency. One was published from Chharodi Farm where we tried an experiment with grass and the quantity of food required to be fed to an animal which was being fed grass only; that has been published and any other work I have done in that way has been published.

7149. Are you in touch with the work of the Imperial Institute of Animal Husbandry in Bangalore?—I am in touch with the Imperial Dairy Expert, but I have had no occasion to deal with their Animal Husbandry Section; but our Grass Committee of which I am a member are trying to do a little work with them.

7150. Have you had occasion to visit Bangalore?—I was Imperial Dairy Expert myself for 9 months.

7151. So that you know that the Bangalore Institute originated from the suggestions made by the Board of Agriculture?—Yes.

7152. So the Board of Agriculture, after all, has done some work?—Yes; all I said was that there are a lot of things discussed at the Board of Agriculture which it takes years to get into the Provinces at all. What we want is a more mobile body, a body that will know something about each Province and be able to make recommendations which a Province will accept.

7153. Are there any big landowners and cultivators in the Presidency who have taken up cattle-breeding?—Not to my knowledge; there are just one or two cases where we have given land to private people to do work, but it has not been very successful up to the present.

7154. Are there many co-operative cattle-breeding stations here?—Yes, in Dharwar we have co-operative breeding stations, all started since the Government cattle-breeding station was started. All over the Presidency we have 18 such societies.

7155. Did the initiative informing those societies come from you or from the local people?—I should not like to say; I should say it came from the Co-operative Department; they formed the society of which you will find five representatives on the grounds in the Show.

7156. Do you as Livestock Expert of the Presidency offer assistance to these co-operative societies?—I do.

7157. Do they come to you?—Yes, every time.

7158. Do you inspect their breeding stock?—I do.

7159. In the event of the outbreak of an epidemic, do you obtain any assistance from the Central Veterinary Research Service?—Every time.

7160. You are in communication with them every time when there is an outbreak here?—I never attempt to go out of my sphere of work with regard to veterinary science; whenever I feel I should get the assistance of the Veterinary Department I get it at once.

7161. Have you got an adequate supply of the necessary sera for inoculation?—I have nothing to do with that; if I want my cattle inoculated I tell the Superintendent of the Veterinary Department. Where he obtains his serum has nothing to do with me.

7162. Do you keep any herd register?—I do.

7163. In keeping a herd register you must grade the stock?—Yes, for breeding.

7164. Do you follow any system?—I do.

7165. What is the basis of your selection? Do you look for milking quality, or what?—No, it all depends what I am breeding for. As I told the Commission before, I am trying to breed a certain amount of milk into all my breeds. Every year or twice a year I go over my herd very thoroughly; I look to the standard points of the particular breed, and I have regard to the milking

qualities of the animals combined with other points. Each animal is registered, each animal's milk is weighed, each animal is measured and weighed.

7166. Do you consider that cattle-breeding is a paying proposition?—No.

7167. That is one of the reasons I suppose why the professional cattle breeder is fast dying out?—Yes.

7168. And yet the price of cattle is going up?—Yes.

7169. And the fodder supply in the country is quite adequate?—Yes.

7170. Yet it is not a paying proposition?—No; I will explain that to you if you wish.

7171. I should like you to clear up that point?—In Ahmednagar district we have a breeder who breeds the black and white animal which you have seen at the Show. He leaves his home and goes from place to place through the different forests right away down to Surat and back again. He lands back at his home just before *Diwali* when he sells his stock. In the old days it did not cost that man a pice to rear his cattle; to-day in this particular locality there are only a very few of these breeders left, and now the cattle have to be supported on purchased fodder; it costs an anna a day to feed these animals. You can imagine what it is going to cost in four years, and in that locality the animal sells at probably about two-thirds of what it has cost to rear it. It could not possibly be a paying proposition.

7172. *Dr. Hyder*: But if it costs more to feed the animal, the breeder sells at higher price?—He does not.

7173. And the price of milk has gone up?—He gets a bigger price for the dual purpose animal.

7174. Prices are about double what they were?—So is the price of everything else.

7175. Why should he go out of the business?—Because now his business does not pay him. I tried to explain; in the old days it did not cost him a pice except for the food of his man or men who went round with the cattle, and the money for that was obtained by taking 1 or 2 ozs. of milk from each animal, making it into *ghi*, and selling it at the next village they went through, or exchanging it for wheat or *bajri* or whatever it might be. Now these people have to pay for all this food, and no matter at what figure you estimate the cost of keeping an animal for a year, it is not a paying proposition. When I say in this note of mine that it is not a paying proposition, I have laid stress on the point that it is not a paying proposition for a man to produce a bull that is fit to use as a breeding bull. Pedigree bull production does not pay and will not pay for years, for the simple reason that out of all the male animals that are born to-day, even on the most advanced farms, you will find there will be about 25 or 30 per cent. of them that cannot be used as premium bulls owing to the degree of impurity in the animals we have.

7176. *Professor Gangulee*: Leave out of consideration this nomadic cattle breeder. Why has not this business attracted the attention of the big land-owners of the country, if there is any prospect of success in it. I mean there is such a big need. And you say that cattle-breeding societies are increasing, and that cultivators are beginning to realise that in order to improve their stock cattle-breeding must be encouraged. In view of all these considerations I do not quite understand why you have not been able to attract private enterprise to this business?—Because it is not paying.

7177. What are the results achieved by the co-operative breeding societies?—They are not paying, and especially during the first four years. After the first four years, when they commence selling their bull calves, they become self-supporting, but it will take them many years to become millionaires from cattle-breeding.

7178. *Mr. Calvert*: I think we have settled now that cattle-breeding does not pay; but you still, I think, hold the opinion that dairying is a paying proposition?—Yes, under the circumstances I have mentioned, where the demand is fairly steady it does pay. The Military dairy farms are paying to-day.

7179. If this dairying is a paying proposition, why is it your capitalists have not taken to it?—The point in this connection is that the capitalist here puts his capital into a dairy farm, but it is actually run by his servants, and the return after the servants have done with it is so very small that the people have not come forward at all. I doubt whether private enterprise could take up dairying as a business for many years to come.

7180. Do you not think the fact the capitalist does not take to dairying is proof positive it is not a paying proposition?—No, because what they fear is disease breaking out and their capital being wiped out along with their cattle, or a severe famine occurring, when they would have to purchase fodder at exorbitant rates. We have not yet actually proved right up to the hilt that dairy farming under present conditions is a paying proposition.

7181. You mentioned liability to disease?—Yes.

7182. As long as there is that liability to disease, do you think it is sound to encourage small cultivators to go in for high-priced animals?—Yes, because disease in India is actually spread by animals which are ill-fed and not taken care of at all. You will find here that, in our Province especially, the animals that are wiped out first are those which are not good animals at all. With a good animal the cultivator knows very well that if he does not give it the necessary attention he is likely to suffer. A man who keeps a more expensive animal than the ordinary village bullock takes a bigger risk, but he is repaid by getting very much more efficient work from a good animal than he would from the ordinary village animal.

7183. *The Chairman*: Is it really your view that resistance against, say, rinderpest or septicaemia is sensibly greater in the case of well-fed animals than in the case of poor animals?—I feel certain of it. If a wave of disease passes over a locality it is the poor animals that go first; they have not the power to resist it. The well-fed animals may be immune or may only get a slight attack from which they recover.

7184. Have you much foot-and-mouth disease?—We have it nearly always, but it has no effect on our cattle at all. You may have to tie them up for two or three days, but that is the end of it. There are no deaths from foot-and-mouth disease in India.

7185. *Mr. Calvert*: With regard to the system of common grazing in India, when you turn cattle out for common grazing would not your good milk-yielder suffer in comparison, with a barren cow or poor yielder?—That is a question put to me very often. Someone says to me: "Will a particular type of animal thrive in a particular place?" If I say it will thrive, I do not mean it will thrive if kept in the same way as the ordinary village cattle which are kept purely as manure producers. It requires more care.

7186. Has one result of this common grazing system been the survival of the fittest, the fittest being the disease and famine resister?—I have put it the other way; in my note I have said that in olden days the improvement of the cattle was due to the survival of the fittest, owing to the cattle passing through large forests and similar areas where the lame and the maimed and the unfit fell behind and were devoured; but to-day the common grazing area is a positive danger to the cattle of a village; each one has an equal chance of getting such grass as there is to be had.

7187. As long as you have the common grazing system, with equal treatment of all animals, your good milker will suffer?—Yes, certainly.

7188. Have you any experience of milk recording by private cultivators in India, apart from official farms?—Yes.

7189. Do you think it is a thing you can introduce as a means of calling attention to a good yield?—We hope in time to introduce it successfully wherever any milking at all is being done. I am doing it in two places in the Bombay Presidency to-day.

7190. If by milk-recording societies we bring home to the cultivator the fact that his cow is uneconomic, what will be the effect? Will he turn to

the buffalo, or try to improve the cow?—We have also to show him the cow is not only a milk-producing proposition, but a proposition for producing draught. We must take the two together.

7191. England is doing very well with a single-purpose animal?—Yes, but the single-purpose animal there is a dairy animal which produces large quantities of milk and has been bred for the last 150 to 200 years.

7192. Our co-operative records show that one of the biggest single reasons for borrowing is to replace cattle?—Yes.

7193. If you are going to introduce a higher priced animal, without reducing its liability to disease, the tendency will be to borrow more?—The point is that like everything else, when this improvement of cattle is first started the cattle must be a little more expensive, but eventually, when they are produced in larger numbers, they will come down to the usual price. It has happened in our Dharwar district already. When three or four years ago we purchased cattle from the Mysore State you could not buy a good pair of bullocks in Dharwar under Rs. 600 to Rs. 800; now they have come down to Rs. 400, simply from the fact that people have taken an interest in it and are doing their own work which somebody used to do for them before.

7194. Were you at the Pusa Conference last December?—No.

7195. At that Conference they had an auction of their spare cattle, and those animals produced very high prices when purchased by ordinary cultivators?—Yes.

7196. It seemed very dangerous to allow such high-priced animals to go to cultivators without their having got over this liability to disease?—It is like everything else; you must take the risk if you want something good. A man has got to have his milk or do without it.

7197. You spoke of the drain of good milch cattle to cities?—Yes.

7198. Do you think that is an appreciable proportion of your total cattle?—Yes, of buffaloes; I was not talking of cows.

7199. Is anything being done here for sheep or goat breeding?—Yes.

7200. Is satisfactory progress being made?—We started three years ago with sheep and have now two centres.

7201. Did you meet with any special difficulties?—One of the experiments I conducted was on a Government farm, and the other on the farm of a fairly large landowner. His attempts have been very successful, and were exhibited at the Poona Show. I obtained cross-bred merinos from Hissar and crossed them with the country sheep, and now I have reached the third generation and hope this year to get sufficiently good results to put into the country to be a striking enough example to the people to carry on.

7202. Have you had any complaints about spotting?—I have had complaints of a number of black animals through crossing two whites, but not of spotting.

7203. *Mr. Kamat*: The state of things in Gujarat is better than elsewhere in the Presidency?—Yes.

7204. Is it receiving any subsidy from Government?—No.

7205. Why are things better there than in the Deccan and elsewhere?—Because, as I have pointed out already, the people in Gujarat pay more attention to their cattle, both buffaloes and cows. They are very particular as to what bull serves their buffalo or cow. In the village grazing areas in Gujarat most probably all the animals will be she-buffaloes or cows; but if you go to the grazing areas of the Deccan you will find as many, if not more entire bulls than there are cows or buffaloes. The consequent deterioration has been so rapid that the animals do not produce enough milk to pay.

7206. It is not the famine conditions of the Deccan, or some such cause, but ignorance of the economics of dairying?—Yes, that *plus* famine conditions and disease.

7207. If you spread a knowledge of the economics of dairying in the Deccan, do you think there would be a chance for the dairy business here?—Yes, with animals imported from Gujarat, but not with the local animals.

7208. In that case, no subsidy from Government would be necessary?—Yes, it would be absolutely necessary. In Gujarat dairying is a paying proposition because it is a cottage industry; it is only a subsidiary industry to the cultivator which his wife carries on, and every pice he gets is profit.

7209. But with effort it could be made a cottage industry in the Deccan as well?—Quite easily.

7210. You said we had lost the butter trade. Would it not be possible to revive it in places like Bombay?—The trade is there, but before and during the War we used to supply large quantities of butter to Ceylon, Java, the various countries of the Malay Peninsula and Burma. Within the last two years Australia, on account of the superior quality of her produce, has cut us out of all that trade.

7211. You said the cow was being neglected in competition with the buffalo. Do you think that, even with all the improvements possible in the breed of cows, the cow could become as profitable as the buffalo in this part of the country?—Yes. I have laid stress on that point before. I say the buffalo as a commercial proposition in a commercial dairy is one thing, and deserves every consideration, but I am not dealing with that question at present; what we are dealing with is the cultivator, and I say for the cultivator the only proposition is to have an animal which will give him a certain amount of milk which he can sell or consume and which will pay for the food of the cow, instead of having to keep a buffalo to supply his milk and a cow to supply his bullock power. That is where I say the dual purpose animal is essential. In a commercial dairy the dual purpose animal is crowded out altogether.

7212. The cultivator values the calf the cow gives him as a draught animal?—Yes.

7213. But he finds himself helpless, so far as the cow as an economic animal is concerned, to maintain her for three or four years until the bullock is mature?—Yes. He has to feed her during such time as she is carrying the calf, and then her and the calf until such time as she calves again or the bullock gives him a return in bullock-power, or, if the progeny is female, until such time as the female progeny produces milk or another calf.

7214. He knows the value of the thing, but with all your improvements can you get over the difficulties for him?—We are striving to produce an animal which will be economic, which will calve earlier and calve regularly, and which will give in addition a great deal of milk to support itself and its calf during the period before the calf becomes useful. Even if it only gives him 2 or 3 lbs. of milk, at 2 pice a pound that gives him sufficient to keep those animals in good condition.

7215. That you are going to evolve?—We hope to.

7216. *Dewan Bahadur Malji*: In Gujarat has not the Rabari's business been chiefly taken over by the Sindis coming in with their herds of cattle?—Not taken over. There is competition between them.

7217. How is it that the Rabaris are giving way?—The Sindi who comes into the Bombay Presidency is not a breeder; he is another leech on the animal breeder. He is a broker who purchases animals from people when they are hard up for cash, and who brings them along in large herds and sells them. He is not a breeder, but a *datal* or agent for selling cattle.

7218. Do you not think the Sindi manages to realise better prices than the Rabari?—He is doing better, because he comes with a mature animal, whereas the Rabari rears the animals.

7219. How does the Sindi breed compare with the Gujarat breed?—What the Sindi brings with him is not the Sindi breed; it is the Malvi and the cross Malvi that he brings down from Rajputana as draught animals.

7220. Am I right in thinking the Sindi breed does not compare favourably with the Gujarat breed?—It does not, as a draught animal.

7221. Can these Sindi herds of cattle resist disease as well as the Gujarat breed?—I do not know.

7222. You told us the butter business had failed in Gujarat?—No, not failed; I said we have lost a certain amount of the export trade we used to do.

7223. What were the chief drawbacks there?—The quality of the butter manufactured.

7224. Did you issue any instructions in those days?—I was not there.

7225. *Sir Ganga Ram*: In the cattle business, cattle lifting pays better than cattle-breeding?—That is so!

7226. Is this Presidency free from that?—Absolutely; we have nothing like it, except in Sind. Our people are honest here.

7227. *Sir Chunilal Mehta*: When giving Sir Henry Lawrence certain figures as to the number of cattle in this Presidency, the imports of cattle and so on, you had not all the figures before you. I have here the last Government Resolution on the subject; perhaps you would like to put that in?—Yes. (*The document was handed in: Government of Bombay, Revenue Department Resolution No. 3252, dated the 30th June, 1925.*)

7228. *The Chairman*: Are you prepared to tell the Commission what you estimate as the cost of maintaining a pair of working bullocks for an average month in the year?—I am afraid it means giving you 12 different sets of figures for different parts of the Presidency, and I could not very well do it.

7229. Are there bulls at stud at the Agricultural Department's farm, apart from the premium bulls?—Yes. Whenever we have facilities for offering our bulls to the public we certainly do so.

7230. At what price?—Free. To the city people and others making a living out of it and to rich merchants there is a certain charge, but I do not know of any instance where a cultivator has been charged anything. It is not under my control.

7231. I am only interested in the difference in practice between the Agricultural Department and your own in that matter. If it is true the Agricultural Department charges a small fee, do you know why it does so?—I really could not say, unless I was told where it was. As I say, I do not see any reason why a wealthy merchant in Poona who keeps a cow should not pay for the service of a bull.

7232. As to the different melting points of butter made from buffaloes' milk and butter made from cows' milk, can you tell us what the difference is?—The average of the results of four experiments subsequently conducted on the melting point of butter is as follows:—

Cow's butter 39·87° c.; buffalo's butter—33·25°c.

7233. Is it really important?—It is a point raised by the people themselves. They say buffalo butter is a great deal more useful for cooking purposes than cow butter. The housewives will tell you that.

7234. Is there any demand for Indian cattle abroad?—There was a very big demand at one time.

7235. If you could really improve your breeds here, do you think that demand might give rise to a very important business?—A very important business. It would help our breeders considerably and change the aspect of cattle-breeding in this country.

(The witness withdrew.)

The Commission then adjourned till 2 p.m. on Monday, the 1st November, 1926, at Bombay.

Monday, November 1, 1926.

BOMBAY.

PRESENT :

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

Sir HENRY STAVELEY LAWRENCE,
K.C.S.I., I.C.S.

Rai Bahadur Sir GANGA RAM, KT.,
C.I.E., M.V.O.

Sir JAMES MACKENNA, KT., C.I.E.,
I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Professor N. GANGULEE.

Dr. L. K. HYDER.

Mr. B. S. KAMAT.

The Hon'ble Sir CHUNILAL V. MEHTA.

Dewan Bahadur A. U. MALJI.

Mr. J. A. MADAN, I.C.S.

Mr. F. W. H. SMITH.

} (*Co-opted Members.*)

} (*Joint Secretaries.*)

Mr. W. J. JENKINS, M.A., B.Sc., I.A.S., Officiating Secretary of the
Indian Central Cotton Committee, Bombay.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) The present organisation of research work in the Bombay Presidency, judged by results, is proving satisfactory.

I have only one or two suggestions to make which, in my opinion, might be carried out with advantage.

(1) More facilities and more funds should be provided for *district research*, i.e., research into *local problems* by *investigators* on the spot.

For instance, the Tapti valley area in East and West Khandesh is a large and important wheat growing tract. In this tract, much could be done by the introduction of new varieties, by botanical selection, by improved agricultural methods, etc., to increase considerably the profits of the wheat grower. But such work to be effective and to make an appeal to the Tapti cultivator cannot be done at Poona, or even at Jalgaon or Dhulia. At an expenditure of about Rs. 1,500, a small wheat research station could be started in the Tapti area and the problems of the local wheat crop studied and investigated.

Such instances could be multiplied in Khandesh and, doubtless, in all other Divisions of the Presidency.

I am therefore in favour of the formation of a *Provincial Research Committee* at Poona, under the chairmanship of the Director of Agriculture. This Committee would administer a *special permanent Research Fund* and, problems such as I have indicated above, should be submitted to this Committee by the district officers with an estimate of the money and staff required to deal with them. This Research Committee would have the advantage of knowing what research schemes were contemplated all over the Presidency and, if the problem seemed a sufficiently important one, would allot the men and the means of undertaking the investigation.

The central expert at Poona would act as an adviser to Deputy Directors in laying out and controlling such local research schemes, in addition to carrying on his own general research work at a central research laboratory or station.

(2) The central research experts should take steps to get in *closer touch with district problems and district workers*. At present, there is a large staff of specialised officers, centred at Poona, who are responsible to a great extent for special types of agricultural investigations.

The visits of these officers to the various districts of the Presidency are *not nearly so frequent* as they ought to be and with the exception of such occasions as a meeting of the Provincial Board of Agriculture, the district officers have little or no opportunity of discussing their problems with these central workers.

This difficulty is being overcome by the formation of Research Committees, viz., the Khandesh Cotton Breeding Committee, and such a system should be greatly extended and developed.

In addition, central research experts should undertake the training of selected district officers who are intended to undertake the investigation of special problems in their district.

The ideal organisation of research work is, in my opinion, the present system of co-operation in cotton research between the Indian Central Cotton Committee and Provincial Governments. The Provincial Governments submit *definite schemes* of research into some *important* problem on cotton cultivation. These schemes are considered by the Agricultural Research Sub-Committee and, if deemed of sufficient importance, are recommended to the Central Committee who, by means of grants-in-aid, provides for the conduct of the research for a definite period of time. Annual progress reports on the scheme are considered by the Agricultural Research Sub-Committee and by the Central Cotton Committee who can control the work of the investigators. Cotton research is thus being adequately provided for and its continuation is not liable to checks or restrictions imposed by the fluctuations of annual provincial budget grants. I would advocate all research work in a Province being organised on similar lines with a *Provincial Research Committee* acting in the same way as the Central Cotton Committee does with regard to cotton research; with a Special Research Fund of a permanent nature in place of the funds of the Cotton Committee and with central research workers and senior district officers taking the place of Provincial Governments as in the present cotton research organisation.

The Provincial Research Committee of a Province should contain representatives of the Agricultural Department—both central and district workers—of other departments of Government dealing with rural development and a non-official member appointed from each of the Divisional Boards of the Presidency. The Director of Agriculture should be *ex-officio* Chairman of the Provincial Research Committee.

(b) In my Annual Administration Report of the North Central Division (Nasik and Khandesh) 1924-25, I mentioned several promising subjects of research and investigation in that Division. Certain of these have been taken up but, others through lack of staff and funds, still remain uninvestigated:—

(a) *The wheat crop of the Tapti valley*.—Proposals for this work had been submitted before I left charge of the Division.

(b) *Ground-nut harvesting in Khandesh*.—The immense increase in the ground-nut area in Khandesh—from 4,119 acres in 1912-13 to 1,40,190 acres in 1924-25 combined with the increasing scarcity and expense of field labour, has raised the problem of ground-nut harvesting by mechanical means to a *very high importance*. Experiments with different types of implements, viz., potato diggers, converted ploughs, etc., were tried on Jalgaon farm but were all unsatisfactory. This problem requires immediate

investigation by agricultural, engineering and mechanical experts.

- (c) *Fruit cultivation, including the drying and preservation of fruit.*—In Khandesh, the cultivation of fruit is growing rapidly and interest is already being shown by advanced cultivators in the manufacture and disposal for fruit products. Fruit growing in Khandesh has its own special problems which require investigation if the industry is to develop. No other type of agricultural research would attract so much *non-official interest and help* in Khandesh as investigations of this nature. A beginning has been made by the establishment of a small nursery in West Khandesh through the assistance of Rao Saheb Gulabchand Shet, a local fruit-grower and a member of the Divisional Board of Agriculture.
- (d) *Sheep-breeding for wool production.*—In Khandesh, the chief income from sheep farming is derived from folding. The *immense* improvement in the wool which selective breeding could accomplish in a *very short period of time* is quite uninvestigated, an important and valuable line of research for the livestock experts.
- (e) *(The improvement of inferior millets.*—The inferior millets form the main staple of food for a large proportion of the inhabitants of the hilly tracts of Khandesh. Their yield is low and could be greatly improved by selection and cultivation of high yielding strains.)
- (f) *Power cultivation in Khandesh.*—Tractor farming is attracting much interest in the more prosperous parts of the Division and the possibilities of co-operative power farming are awaiting investigation. The large importing firms will not conduct the necessary trials required to establish the economic utility of tractoring in India and results obtained in other countries are useless. Efforts to obtain complete information on the financial side of tractor and power farming as well as the cultural aspect of the problem, are badly needed.

These few instances by no means exhaust the list of problems which are being inadequately conducted or completely held over in Khandesh on account of insufficient resources or organisation. The importance, as well as the diversity of the instances quoted above, may indicate however the urgency of increased development of research especially in the districts.

Another point which is worthy of mention is the necessity of encouraging—and if necessary, subsidising—non-official gentlemen who have facilities and are desirous of conducting small schemes of research work on their own farms, under the guidance and direction of officers of the Agricultural Department. I have come across many such progressive cultivators in Nasik and Khandesh districts and I believe that with a little encouragement and help from Government, there is a wide field here for extending our knowledge of agricultural improvements at small expense and in a practical and effective manner. The results of research work actually obtained in the district are much more likely to be adopted by the cultivators of that district than improvements worked out elsewhere and imported for introduction.

QUESTION 2.—AGRICULTURAL EDUCATION.—My experience of agricultural education in my late district of Nasik and Khandesh was confined to—

- (a) Dhulia Vernacular Agricultural School, Dhulia, West Khandesh.
 (b) Agricultural bias classes at different centres in the Division.

Dhulia Vernacular Agricultural School was opened in January 1923 and students who were sons or relatives of cultivators in the Division and who had passed the 4th Vernacular Standard, were admitted to a two years' course. The students are now accommodated free in buildings on Dhulia Government Farm and their board is defrayed from funds, collected by a

local committee of non-official gentlemen. The number of students is fixed at 30, 15 being first year and 15 second year scholars. The training is largely practical, full advantage being taken of the facilities offered by the farm.

Agricultural bias classes have been started at about six centres in the Division with the object of giving an agricultural outlook to primary rural education.

(i) The supply of teachers and institutions in the Division would appear to be sufficient although there was a demand for another agricultural school for Nasik district and for agricultural bias classes at other villages. It is doubtful however whether these demands form a *real reflection* of the cultivators' requirements. It was always *difficult to get the full complement* of boys for the Dhulia School and required much preliminary propaganda on the part of the Headmaster and my district staff.

(ii) No, I am not prepared to say that there was an urgent need for the extension of teaching facilities in any part of the district. If there was, it was not sufficiently voiced to come to the attention of my district officers or my Divisional Board.

(iii) Yes, I consider it advisable that teachers in rural areas should be drawn from the agricultural classes, as they would be much more fitted to gauge the educational requirements of their pupils. I am strongly in favour of agricultural bias classes which in my opinion, are doing good work, the results of which will only be fully realised later on. Such classes must have teachers from the agricultural community and these *must be practical men* with a working knowledge of the agriculture of the district.

(iv) In my experience, it was always possible to bring the complement of students at Dhulia School up to full strength but it was necessary to do much propaganda and the Headmaster had to tour the villages personally in order to obtain the requisite number of suitable boys. The cultivators do not appear on the whole to appreciate the advantages of an agricultural training for their sons and many of them must feel that it is not possible to spare a boy from the work of the home fields for so long a period as two years. There were one or two cases of boys leaving the school during the course and not returning. This was generally due to his services being required at home.

(v) At the commencement of Dhulia School, it was laid down that the course should be *solely* for the sons and relatives of cultivators and the object of the training would be to *fit them for the better farming of their family lands*. However, several applications from former students were received for fieldmen's posts in the Agricultural Department and I believe that the hope of obtaining service of this nature was a *big incentive* for many of the students in undertaking the training. I see no objection to this being the case as I consider that the supply of properly trained fieldmen is regrettably scanty and must be considerably increased in the interests of agricultural work in the Division. It is not possible to find a source of *trained local men* from the agricultural classes except from the former students of an institution such as this.

(vi) In the institutions, mentioned at the commencement of my replies to this section, *all pupils* were drawn from the agricultural classes.

(vii) I have always endeavoured to make the existing courses of study in the agricultural schools under my control as *practical as possible* and have made modifications in the courses of training from time to time with this object in view. No other type of training is of any *real value* to students attending agricultural schools.

(viii) Nature study, if applied to practical agricultural problems of the district is valuable; if not, it is a waste of time. Many teachers, I have found, are too apt to wander off into theory, without emphasising to their students the practical application which, in most cases, lies behind it.

School plots are useful if well supervised and made an object of interest to the pupils. The best school plots in my district were organised at Bhusaval High School, East Khandesh, by a teacher interested in agriculture. The

boys worked on the plots *after school hours* and were allowed to dispose of the produce of their own plots as they wished. Most of the school plots in my district were much too small and were badly laid out and managed.

A school farm is *essential* to a real agricultural school. At Dhulia, the Government Farm, with the exception of the cotton breeder's area, is managed by the Headmaster of the school who is also the Farm Superintendent. By this means, the students are enabled to get complete training in all farm operations *which they do themselves* under the guidance of the staff of both the school and the farm.

(ix), (x) and (xi) I have no replies to offer on these points, as all the boys attending institutions under my control, were from the cultivating classes and returned to their villages on the completion of their training.

(xii) and (xiii) With reference to adult education in rural tracts, I would like to point out that, in my opinion, the greatest deficiency in the present system of agricultural education is that there are *few if any facilities provided in the districts for the training of men of the muccadam (fieldman) type in specialised forms of agriculture* from the practice of which such men could make a good living. I refer to such subjects as well-making, working of boring machines, tractor driving, fruit cultivation, repairing of implements, *gul* manufacture, care of cattle, poultry farming, etc.; and more generally, the cultivation of certain major crops, *e.g.*, wheat, cotton, sugarcane, etc. I believe that a greater demand exists for such a type of man—after he has received practical training—on the larger estates and bigger farms of Khandesh than for the agricultural graduate. It should not be impossible for the Agricultural Department to utilise the staff and resources of district farms and experimental stations for the organisation of *short and purely practical courses* for cultivators and men of the "Kamgar" class who are either specially interested in such subjects or are desirous of adopting one of them as a profession. Such short "farmers' courses" have proved very popular and useful in other countries, *e.g.*, Denmark, and all that would be necessary for the institution of such courses would be the provision of accommodation for men at certain selected centres and the organisation of suitable staff for instructional purposes.

I would also suggest that students at Poona Agricultural College who take general farming or farm economics as their special subject should be obliged to spend a definite period of time on a Government farm in the district before being allowed to appear for their final examination.

During my period of work as Deputy Director of Agriculture, Nasik, and Khandesh, I endeavoured, at the suggestion of Sir Chunilal Mehta, then Hon'ble Minister for Agriculture, to organise an annual course in farm management at Jalgaon farm, East Khandesh for graduates of Poona Agricultural College. The idea of the course was to fit men for such posts as farm and estate managers and it was anticipated that there would be a demand for such trained men from the big landowners in Khandesh and elsewhere. Accommodation for four graduates was erected on the farm and the proposed course was well advertised. Very few applications were received and most of these were from applicants who were *not* graduates of Poona Agricultural College. One or two from these were selected for the course but failed to report at the farm. In short, the proposed course proved unattractive to the type of man for whom it was arranged and whom it was intended to benefit. There are probably many reasons for this but, in my opinion, the chief ones are:—

- (1) The desire for immediate employment after leaving college and the unwillingness of graduates to spend further time in study or practice before entering employment.
- (2) The length of the proposed course and the unattractive condition of residence—without allowances—at Jalgaon farm.
- (3) The doubt as to whether attendance and completion of the course would be of any very material assistance in getting better employment afterwards.

It is not easy to put forward methods of overcoming these objections to such a course but I suggest the following:—

- (a) Such a course should not be confined to graduates of Poona Agricultural College but should be advertised as available for any applicant in India who is approved by the Deputy Director of Agriculture, North Central Division.
- (b) The length of the course should be shortened to six months—say from May to October—which will cover the cotton growing season.
- (c) Government should be approached to grant a subsistence allowance to men from Bombay Presidency who undertake the course and arrangements should be made to enable the students to live entirely at the farm.
- (d) The authorities at Poona Agricultural College should be approached to give more publicity to the course among final year students and in addition employers of skilled agricultural labour in Khandesh may be requested either to send their present managers, estate agents, etc., to the course or to insist on future employees having taken this course of training. A register of possible employers should be maintained at the farm and every effort made to bring students of the course in touch with such big landowners as may desire trained men.

If new conditions are approved, these should be widely advertised not only in the Bombay Presidency but also in the Central Provinces and in the Nizam's Dominions.

QUESTION. 3.—DEMONSTRATION AND PROPAGANDA.—(a) The measures which have proved most successful in influencing and improving the agricultural practice of cultivators are:—

- (1) *Well-organised, continuous and intensive demonstration and propaganda work conducted in the districts, especially in co-operation with non-officials and non-official local bodies.*

Note.—Actual field demonstration on the cultivators' own land conducted by well-trained practical demonstrators is the *only really effective method.*

The areas for a demonstration campaign should be *small and carefully selected* and only *one or two* improvements, specially chosen with reference to the main requirements of the area, should be demonstrated at a time.

The distribution of vernacular literature on agricultural improvement, unless in conjunction with field demonstration is of *practically no value.*

Similarly village lectures, magic lantern shows, the use of the cinema, etc., are generally *very ineffective agents in agricultural propaganda.* The chief value of such measures is to attract cultivators to attend field demonstrations.

The *value of non-official help in agricultural propaganda cannot be over-estimated.* In Khandesh, Bombay Presidency, this help has crystallised in the shape of Taluka Development Associations, which bodies have been of great value in the past and, if suitably financed, will do much more important work in the future. When I was Deputy Director in the North Central Division, Bombay Presidency, I got much help from these Development Associations and co-operated with them to the fullest extent. I should like to see an active Taluka Development Association in every taluka.

More use should be made of *ex-students of agricultural colleges and schools* in district propaganda. A good cultivator who knows improved methods of agriculture and *applies them with success on his own lands*, is the finest type of demonstrator.

Successful district demonstration and propaganda work *can only be achieved with the co-operation of all departments of Government*, especially the Revenue Department. In Khandesh much success was due to this co-operation.

I am not particularly enthusiastic over small *district agricultural shows* as agents in propaganda.

A great deal of progress in agricultural improvement could be made if more use were made of *co-operative credit societies* to organise field demonstrations for their members. The more co-operation there is between the Agricultural and the Co-operative Departments, the more rapidly will agricultural improvement spread and the cultivators be benefited.

All this work, mentioned above, can be of very little avail without:—

(2) *The organisation of sources of supply and maintenance, in the case of improved materials, and, of supervision and direction, in the case of improved methods.*

Note.—Propaganda must be followed and supplemented by organisation of:—

Supply and maintenance	Materials.
Supervision and direction	Methods.

In the first instance, this organisation must necessarily be *official* or, at least, semi-official. As the improvement demonstrated catches on and spreads, it should become solely *non-official*, e.g., introduction of iron ploughs.

Firstly supply was organised by the Agricultural Department from the Government farms and implement depôts. Secondly, this work was taken up by non-credit co-operative societies, credit co-operative societies, Co-operative Banks and Taluka Development Associations. Now, in Khandesh at least, the bulk of supply is direct from manufacturers' agents to the cultivators.

The introduction of artificial manures, especially in irrigated tracts, is following the same sequence.

The Agricultural Department should eventually *cease all supply* and should be the guardian of the interests of the cultivators in their relations with suppliers.

In this work, there is an *immense field* for *co-operative enterprise*.

Manufacturers and suppliers are *not* assisting, as they ought to do, in this aspect of agricultural development.

The important fact is, that, *in order to introduce agricultural improvements on a wide scale*, the cultivator must not only be convinced of their economic advantage but also must be *provided with local facilities for adopting such improvements and continuing them in his own practice*.

In the case of the introduction of improved *methods*, it is necessary that propaganda should be followed up by the organisation of *direction and help* to cultivators who wish to adopt the improvement.

The Agricultural Department must take a bigger share of this work and continue it longer than in the case of the introduction of improved *material*. Finally, this supervision should be done *co-operatively* or by taluka organisations until the necessity for such guidance disappears and the improved method becomes regular practice.

(b) A field demonstration, to be effective, must be:—

- (a) Well organised.
- (b) Efficiently conducted.
- (c) Completely followed up.

At present, in my opinion, the organisation of field demonstrations is *capable of considerable improvement*.

The essentials are that the demonstration should be *sufficiently advertised* beforehand; that efforts should be made to have, at least, one *preliminary discussion* on the subject of the demonstration in the village sometime before it is actually commenced; that the programme of demonstrations should be formed only after *full consideration of local requirements* and, if possible, in *consultation with local cultivators* and all demonstrations should be *followed up to their logical termination*.

To do all this successfully, a better organisation than is in existence at present is necessary. I am of the opinion that, just as there exists in nearly every village, a revenue *patel* and a police *patel*, so, especially in the larger villages, an agricultural or "shetki" *patel* should be appointed whose duty it would be to assist officers of Government and non-officials interested in agriculture in organising and advertising field demonstrations, etc. If such men could not be obtained on an honorary basis, some small remuneration might be granted to them by Government. In addition, these "Shetki" *patels* could be given two or three iron ploughs, a chaff-cutter, *petari*, etc., and any such improved implements suitable to their village conditions. These implements would be available for demonstrations whenever an overseer or fieldman of the Agricultural Department or local association visited the village and they could also be hired out to the cultivators and a small commission on the hire receipts allowed to the agricultural *patel*. I believe that a system of this nature would be the cheapest and most efficient means of bringing agricultural propaganda to the notice of the large masses of the agricultural population and would result in the development of a very much wider and diffused interest in improved farming methods.

In addition, the appointment of "Shetki" *patels* would have considerable value in emphasising to the villagers the importance of better agriculture in the eyes of Government.

Field demonstrations must be well-conducted and the technique should be as perfect as possible.

At present a large bulk of field demonstrations in the districts are conducted entirely by men of the "fieldman" type, i.e., men drawn from the cultivating classes with little or no training in improved agricultural methods. Their work is supervised by "agricultural overseers," generally graduates of Poona Agricultural College.

This supervision, on account of shortage of staff, cannot be thoroughly effective and, as every worker in the district knows, the efficiency of the fieldmen appointed by Government and by non-official associations for work among the cultivators is, in more cases than not, extremely low.

In Khandesh, I endeavoured to meet this difficulty by organising a class for fieldmen on the Government farm, Jalgaon. This class did not extend beyond a fortnight but it was attended by practically every fieldman in the Division, both in Government and in non-official employment and proved a very valuable training. If field demonstrations are only to be conducted by men of the agricultural overseer type, progress will be extremely slow as these officers are expensive and cannot be multiplied to meet all requirements. Many minor improvements can easily be demonstrated by men of the "fieldman" type, if such men are given a good preliminary training and examined as to their suitability and efficiency before appointment.

The lack of trained fieldmen is one of the greatest hindrances to the wider extension of non-official organisations for agricultural improvement.

Every Department of Agriculture should now be organising and training a large body of these men, who can go out into the villages and demonstrate with their own hands and in an efficient and practical manner, the agricultural improvements most suited to the areas in which they have to work.

Finally, field demonstrations, to be thoroughly effective, must be closely followed up. For instance, suppose it has been arranged to hold a field demonstration in a village, to illustrate the advantage of using castor cake as a manure for cotton.

In my opinion, the following programme should be followed:—

- (1) The agricultural overseer should visit the village about the end of May—two to three weeks before sowing time—and should explain the purpose of the demonstration to the cultivators and endeavour to arouse their interest in the work. This could easily be done by an informal talk in the village "kacheri" in the evening. At the same time, he should select the field for the demon-

stration and mark out the plots, control plots, etc., and give full instructions to his fieldman.

- (2) The actual sowing of the seed and manure should be done by the fieldman and the differences between the treated and untreated plots clearly explained to the cultivators who should be called to attend the work at this time. They should also be given details about the cost of the manure used.
- (3) During the growing season, *at least* one demonstration should be held by the fieldman on the plots under treatment and, at such a time, any differences between the manured and unmanured plots should be discussed with the villagers and comparisons made.
- (4) A final demonstration should be arranged about the time of the first or second picking. The agricultural overseer should be present and the result of the demonstration should be discussed and the cultivators shown *by actual weighments on the spot*, how the manuring had proved advantageous and profitable. This would be followed up, in the evening, by another informal talk in the village when opinions would be invited and the whole course of the demonstration reviewed. At this time, the names of cultivators, desiring to make their own tests with the manure next season, should be taken and the organisation of a future supply of castor cake to the village should be considered.

If a system of work on these lines were adopted and put into general practice, I feel certain that field demonstrations would make a very much wider appeal to the cultivators and would prove of much greater value in the improvement of local agricultural practice.

I consider that the accurate recording of field demonstrations—as opposed to field experiments—is of little or no value and is a waste of valuable time and energy. The purpose of such demonstration work is not to provide material for annual reports or association leaflets but to *educate the cultivator, through the agency of his own eyesight*, on the value of introducing agricultural improvements in his farming practice.

In conclusion, I would like to state my belief that the amounts of money spent on research work and on propaganda work are quite disproportionate having regard to the relative importance of these two necessities in agricultural progress. Research work is of *no value whatever to the agricultural masses of India unless the results obtained from it are brought to the notice of the cultivators and are incorporated in their general agricultural practice.*

It has been my experience however that whereas money for research is generally comparatively easy to obtain, the provision of funds for propaganda among the cultivators is almost ludicrously inadequate.

I commented on this fact in my Annual Administration Report, North Central Division, Bombay Presidency, 1924-25 when I wrote:—

“Judged by the only real criterion of success, namely the extent to which agricultural improvements demonstrated, are adopted by the cultivators, the year's propaganda work has proved very successful. It is therefore all the more to be regretted that more funds are not available for this work. A sum of Rs. 700 is totally inadequate for demonstration work in this Division and imposes a definite limit on expansion in this direction, even when non-official assistance is taken into account.

The North Central Division (Nasik and Khandesh) comprises in all 33 talukas and petas so that the amount available for demonstration in my budgetted grants for 1924-25 was little over Rs. 20 per taluka.”

QUESTION 4.—ADMINISTRATION.—(a) Speaking from the standpoint of a Deputy Director of Agriculture, I feel that a better co-ordination of the agricultural activities of Governments in India, especially with reference to the means to be adopted for introducing agricultural improvements to the culti-

vators, would be facilitated if provision was made for a *fuller interchange of experience and opinions* between officers of the Agricultural Departments of different Provinces, particularly of such Provinces to which certain problems are more or less common.

For instance, much of the work, both research and propaganda in Khandesh is *very similar* to the work being carried on in the Berar district of the Central Provinces and an interchange of ideas between, not only the superior officers, but also the district staff, of these two districts could not fail to be productive of mutual advantage. Further such co-operation between the agricultural staffs of adjoining or similar districts in different Provinces may be of direct practical importance as in the case of the prevention of the admixture of the Khandesh ground-nut crop or in questions affecting cotton marketing.

However, although the Deputy Director of Agriculture, Khandesh, may meet his colleagues from the Konkan or from Sind several times during the year, his only contact with the Deputy Director of Agriculture, Berar, is by correspondence, by the perusal of annual reports and similar literature or by a chance meeting at a biennial Board of Agriculture in India, provided that both officers have obtained the sanction and the wherewithal to attend from their respective Provincial Governments. The facilities afforded to other and less senior members of the district staffs for interchange of ideas and opinions are even less than these.

However convenient it may be to organise the Departments of Agriculture in provincial cadres, it appears to me that some provision is very long overdue in order to enable official workers towards agricultural improvement in all its different directions to reduce somewhat the very arbitrary restrictions imposed by purely geographical limitations. During my five years service in Khandesh I can recollect only one occasion on which the Cotton Botanist of the Central Provinces visited my cotton research station at Dhulia and similarly only one occasion on which my Cotton Breeder at Dhulia was permitted to visit the Central Provinces. As both these officers were busily engaged on work which, if successful, held vast possibilities for the improvement of the cotton crop in *both* districts, I consider that a much greater degree of personal co-operation should have been achieved, and fuller facilities provided for mutual discussion of problems so common to both areas. I have only had one opportunity of attending the All-India Board of Agriculture at Pusa and of seeing the work carried on at the Agricultural Research Institute there. In my opinion, by no means the least valuable result of this experience was the opportunity afforded to meet agricultural workers from other Provinces and to obtain from them fresh ideas and suggestions which could be adapted to meet the special requirements of agricultural problems in my own district.

(b) I am strongly in favour of a very effective and well-equipped *central organisation* supplementing the work of Provincial Departments and dealing in particular with problems of All-India importance.

I would not have this central organisation concentrated at one large Central Research Station but I would have a system of small investigation centres, manned by agricultural experts, and dealing with *definite agricultural problems* in tracts where the result of successful research would be to the greatest advantage to the cultivators. These centres would be maintained by a fund administered by the central organisation and they would co-operate in the fullest manner with provincial workers dealing with similar problems.

In the same way as the work of the Indian Central Cotton Committee in no way replaces provincial research on cotton improvement or enables Provincial Governments to reduce expenditure on this branch of agricultural research, so, an active central organisation dealing, not only with research but also with other equally important factors of rural development, has a definite and important place to fill in the improvement of Indian agriculture. The Institute of Plant Industry at Indore, which is largely financed by the Indian Central Cotton Committee and which is primarily intended for investigation into the cotton crop of Central India, is the type of central

research station which I advocate. The Institute has already achieved a high degree of co-operation with other cotton research stations throughout India and I see no reason why the organisation for the improvement of other crops should not follow successfully on similar lines.

Research workers are notoriously self-contained and jealous and a system which encourages research purely on a provincial basis will not succeed in developing the team spirit which, in my opinion, is essential to successful and rapid results. Further, although it may be submitted that the necessity for a central organisation is not strongly felt at present and that the work of rural development can easily be controlled and fostered within purely provincial boundaries, I believe, that with the development of *co-operative organisation* as a more potent factor in agricultural improvement, the necessity of an efficient All-India organisation will become more and more felt.

✓ QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) As it is unprofitable to generalise on the subject of agricultural indebtedness I shall confine my evidence to the case of the Khandesh cotton-growers, whose condition in this respect, I have had special opportunities of observing and investigating.

In Khandesh and at the present time, there is *no evidence to show that the cotton-grower is seriously hampered by indebtedness* and, indeed, the results of a recent detailed investigation financed by the Indian Central Cotton Committee, indicate that he is very considerably less the victim of his financing agents than is generally believed to be the case.

(i) *The main causes of borrowing are:—*

- ✓ (1) At the commencement of the sowing season—for current cultivation purposes, *e.g.*, purchase of seed, purchase of cattle, etc. (In some villages, tenants have to pay the rent of their lands in advance and this accounts for some heavy borrowings.)
- (2) At harvest time, for the expenses incurred in harvesting and marketing the crop of *kapas*.
- (3) For maintenance of self and family during years of crop failure.
- (4) To meet the expense of social and religious obligations.

(ii) *The sources of credit are:—*

- (1) The village *sowcar*.
- (2) The co-operative credit society.
- (3) Petty cotton traders.

Investigation in 10 typical cotton-growing villages of Khandesh during the 1925-26 cotton season showed that, at the commencement of the sowing period, out of 806 cultivators questioned, 620 (76.9 per cent.) had made borrowings, totalling, in all Rs. 1,70,885.

In 8 villages, there were co-operative credit societies; in 2 there were none.

Of the 620 cultivators mentioned above:—

- 248 (40%) took advances from *sowcars* only.
- 206 (33.2%) took advances from co-operative credit societies only.
- 163 (26.3%) took advances from both *sowcar* and co-operative credit society.
- 3 (5%) took advances from petty traders.

The total amount borrowed (Rs. 1,70,885) was taken from the following sources:—

Sowcar	Rs. 82,571 (48.3%).
Co-operative credit society	Rs. 88,289 (51.7%).
Other sources	Negligible.

(iii) *The main reason which would prevent repayment is, in my opinion, complete or partial failure of the cotton crop which is the money crop of the cultivators.*

In West Khandesh about 12 per cent. of the cultivators investigated borrowed more than their crop realised. The percentage was higher still in East Khandesh but here, the area under ground-nur was approximately equal to that of cotton in the villages examined and advances therefore really relate to *two* cash crops instead of one.

The annewari valuation of this year's crop was—

West Khandesh	8 annas
East Khandesh	6 annas

taking the districts as a whole.

QUESTION 8.—IRRIGATION.—(a) In my late charge—Nasik and Khandesh—there is no considerable development of canal irrigation and I do not know of any schemes under contemplation for the construction of new canals or the extension of existing systems in the near future.

(The most interesting form of irrigation in the Division is the "co-operative irrigation" which is to be found in the *patasthal* areas in Nasik and West Khandesh, especially in the Panjra valley of the last named district. This "phad" system of irrigation has its origin in the mists of antiquity but there is no doubt but that, for generations past, the cultivators of these irrigated tracts have been practising and practising successfully, a system of co-operative irrigation which is, so far as I know, quite peculiar to these districts and which is worthy of imitation wherever similar conditions exist.

The water-supply is derived from *bhandaras* built across the river bed which descends in a series of steps to the level ground around Dhulia. Many of these *bhandaras* are structures of considerable age and were obviously built to last. Distributary channels convey the water from the collecting area to the village lands, which are sub-divided into a varying number—generally three or four—large sections or "phads" from 100—500 acres in extent—or even more—according to the size of the village. All the village cultivators have holdings in each of these "phads" the size varying, of course, with the wealth and standing of the owner.

The management of the entire system is conducted by a village council or "panch" of prominent cultivators who decide not only *which phads are to receive water each year*, but also *what crops are to be grown in them*. The distribution of the water is done by village servants, generally *Bhils*, who receive payment in kind from each cultivator and who have certain additional privileges such as the right to grow crops in the water channels, etc., etc. Each *phad* receives water in rotation so that, in a four *phad* system, perhaps only one, or at the most two, *phads* would receive water in one year and heavily watered crops, *e.g.*, sugarcane would only be grown on any one *phad* once in four years. A typical system of few *phads* would contain one sugarcane *phad*, one wheat *phad*, one *bajri* or *jowar phad* and one *phad* devoted to miscellaneous pulses, etc. The crops to be grown each year in each *phad* are decided by the village council and, as far as my information goes, disputes or appeals to the Revenue officials of the district for mediation, are conspicuous by their absence.

The advantages of such a system are too obvious to require much mention but it is noteworthy that some of the best cultivation in Khandesh is to be found under this system, and the villagers of such tracts are generally most receptive to the introduction of improved agricultural methods or material.

It is indeed a most remarkable sight in a district of comparatively small holdings to come across a three hundred acre block of sugarcane cultivation, the ownership of which may possibly be shared by as many as sixty different cultivators. In years when water is scarce, the village council "cuts its cloth to suit its coat" and dry crops alone may be grown. Such a system, as is described above, can readily be imagined to lend itself to the development of co-operative enterprise in other directions, *e.g.*, manure supply, crop protection, etc.

I think that the possibilities of extending a system of irrigation on these lines, which has stood for generations and which is so thoroughly suited to the

needs of the irrigator and the requirements of his capital and his land, would repay the closest and most thorough investigation.)

(Another, but less pleasing feature of irrigation in Khandesh is the very large number of wells which have gone out of use, whether this is due to physical or to economic reasons, it is difficult to say. Probably both have had some effect. The extension of cotton cultivation and the high prices of *kapa* during the past few years, the scarcity of labour and of good work cattle are all factors which have had some influence on the decline of well irrigation. Possibly, however, the main reason is to be sought in the physical effect of long continued use of well water resulting in the frequent lowering of the water surface of the well below the sources of recuperation which thus gradually choke up and the well "goes dry.")

I suggest that there is much research to be done on this problem and that the possibilities of boring, blasting or some similar mechanical treatment of the wells might repay scientific investigation.

(In conclusion, I would like to mention a type of irrigation problem which was constantly being brought to my notice in Khandesh and Nasik districts. I refer to the construction of *small river bhandaras* to catch the monsoon rainfall for storage and subsequent utilisation for direct crop irrigation or for indirect use in the form of improved well-supply. Many of the schemes which I examined during my tours had to be rejected immediately on account of cost, but I believe that a combined engineering and geological survey of certain river and *nulla* beds in Khandesh might pave the way for the commencing of profitable and effective schemes of this nature. I am influenced in this opinion by the exceedingly large number of old and broken down *bhandaras* and weirs which are to be found on nearly every little stream in the district and which, to my mind, indicate that the ancestors of the present Khandesh cultivators found the production of small areas of irrigated crops a feasible and a paying proposition.) My experience in the districts convinces me that the descendants of these old Khandesh cultivators are beginning to realise more and more the agricultural wisdom of their forefathers in this respect.)

QUESTION 10.—FERTILISERS.—(a) I am of the opinion that, although the most rapid means of obtaining higher yields and better crops is by the general introduction of *better cultural methods*, much greater use could be profitably made of manures, both natural and artificial.

I do not think, however, that the time has yet come for intensive propaganda in this direction as, until cultural methods are improved considerably, the introduction of manurial treatments, especially on dry crops, can only be partly successful.

To begin with, I would advocate the fuller utilisation of *natural manures*, e.g., farm-yard manure, crude night-soil and poudrette, castor and ground-nut cake, composts of different kinds and decomposed waste materials, e.g., ground-nut husks, leaves, straw, cotton stalks, etc.

In most cases, one or other of the above-noted materials are generally available in comparatively large quantities in every village of the Deccan and *their proper utilisation is within the means of every cultivator*.

In detail:—

Farm-yard manure is the most commonly used manure in spite of the fact that it is largely utilised for fuel. Every cultivator is aware of the advantage to be derived from the use of farm-yard manure on his fields. Propaganda to demonstrate the advantages of this manure is not necessary. *What is badly needed is instruction and propaganda to show:—*

- (a) the best method of storing farm-yard manure, i.e., construction of manure pits, etc.;
- (b) how to utilise small quantities of farm-yard manure to the best advantage, i.e., by mixing with other waste organic materials; thorough incorporation with the soil, etc.

Crude night-soil and poudrette.—A very valuable source of nitrogenous manuring which is, *by no means, fully exploited and utilised.* In Khandesh, the results of crude night-soil manuring of the cotton crop on the Government Farm, Jalgaon, have had a most remarkable effect in overcoming long standing prejudices and in popularising the use of this material by the cultivators. The price of this material per cart has *increased at least threefold* in the past five years and the *demand is now greatly in excess of the supply.* I would advocate every assistance being given to Municipalities who wish to organise the manufacture of poudrette and I have submitted a *list of recommendations to the Government of Bombay* as the result of a full inquiry into the utilisation of night-soil and town sweepings as a source of manure in the North Central Division of the Bombay Presidency.

Castor and ground-nut cake.—The advantage of the use of these substances as a manurial treatment for the cotton crop has been one of the *chief subjects of propaganda* in Khandesh during the past five years. The extension of this improvement has been very rapid and forms, I think, the only instance of a *wholesale introduction* of a dry crop manure in the Bombay Presidency. In view of the great increase in the ground-nut crop in Khandesh, the use of ground-nut cake as a cotton manure is of increasing economic importance. On Jalgaon Farm an *average increase of over 200 lbs. of kapas per acre* has resulted from cake manuring during the past five years.

Composts.—There is much to be done in research and experiment into the value of different kinds of composts for manurial purposes and into the best methods of their preparation. I consider, however, that compost manures have a great possibility in many parts of the Presidency and that no time should be lost in investigating the potential sources of such natural manures. The forests and waste lands of the Deccan contain much material which at little expense or trouble, could be converted in the villages into a valuable source of nitrogen for the crops.

Decomposed waste materials.—Before I left my late Division, plans had been submitted for a scientific investigation into the use of waste materials for manurial purposes by the agency of bacterial decomposition. This work should be commenced *as early as possible* and every effort made to examine thoroughly the possibilities of increasing manurial supply in this direction. In Khandesh, ground-nut husks and cotton stalks are to be obtained in immense quantities and, if suitably treated, might form a valuable adjunct to the manurial resources of the district.

The most important considerations governing the use of substances, such as those mentioned above, for manurial purposes are :—

- (1) They must be *available cheaply and in large quantities.*
- (2) They must form a *source of nitrogen and add appreciably to the organic content of the soil.*

Artificial fertilisers, *e.g.,* nitrate of soda, sulphate of ammonia, etc., cannot compete with organic manures *except in the irrigated tracts and on valuable crops.* The relative expensiveness of these materials make their introduction into any area where rainfall is insecure and only dry crops are grown a most difficult and hazardous business.

In the irrigated areas and on garden crops the use of nitrate of soda and sulphate of ammonia is *increasing considerably* and is proving most profitable to the cultivators of such crops as sugarcane, onions, etc., etc.

(b) I have not met with any instances of the fraudulent adulteration of fertilisers in my late district. It might be possible to authorise officers of the Agricultural Department to visit the stores and godowns of dealers in artificial fertilisers in the villages, take small samples of their stocks and submit these to the Agricultural Chemist at Poona for analysis. If fraudulent admixture was detected, action by law could be then taken against the vendor and supplier.

- (c) The only method of popularising new and improved fertilisers is:—
Demonstration followed by organisation.

By demonstration, I mean field demonstration on the villagers' crops and, by organisation, the necessary arrangements to supply the required fertiliser to the cultivator in *his own village* and *at the cheapest possible rate, consistent with good qualities, e.g.,* co-operative manure supply societies. As an inducement to cultivators to lend their fields and crops for manurial demonstrations, I used to arrange for free supplies of the manure under trial to be given to cultivators willing to allow the results on their land to be recorded and demonstrated. There was never any difficulty in getting a sufficient number of cultivators to agree to such an arrangement.

Visits to Government farms, where manurial experiments are being conducted, have proved valuable in the introduction of new manures but such farm demonstrations *must be supplemented by field demonstrations on the cultivators' own lands.*

- (d) *In Nasik district:—*

- (1) The use of *sulphate of ammonia* for the *sugarcane* crop in the canal areas. This is now a general practice in all the canal sugarcane growing tracts of Nasik district. It is rather exceptional to find a cane grower in these tracts who does not use this manure along with castor cake for his cane crop. This introduction is entirely the result of departmental demonstration.

- (2) The use of *castor cake* (400—600 lbs. per acre) for the *chilli* crop in Nasik district.

This treatment was recommended to the cultivators as a result of experimental work in Nasik district. It is being widely adopted.

- (3) The use of *nitrate of soda* 200—400 lbs. per acre for the *onion* crop in Nasik district.

This has been widely adopted and organisation of supply of the fertiliser is being undertaken.

- (4) The use of *ammonium sulphate* as a substitute for "rab" on the *rice* crop in Nasik district.

After demonstration by the department, the demand for the ammonium sulphate increased ten times in one year. A special supply depôt for the rice tract was opened.

- In Khandesh districts.*

- (1) The use of *castor cake* (300—400 lbs.) per acre for the *cotton* crop.

This practice is extending very rapidly and shows indications of becoming general. The chief necessity at present is the adequate organisation of supply.

(e) Some of the results of investigations into manuring with artificial nitrogenous fertilisers are given above. I would not say that the effects of such manuring have been sufficiently investigated but *this work is still going on* on our experimental farms and plots, as well as on the cultivators' fields in the districts. I do not think, from my experience, that *potash and phosphatic manures*, except in a few very special instances, e.g., coconut, betel, vine, etc., give sufficient promise of good results to be persevered with at present when there are so many more urgent and promising lines of investigation to be explored. It is possible that better results will be obtainable from these classes of manure when a higher standard of cultivation is attained.

(f) I can suggest no other means except the opening up of other sources of fuel, e.g., by *co-operative leasing of fuel coupes in the forests* by local associations and continuous propaganda to impress upon the cultivators that by *burning cowdung for fuel, they are burning their crops and losing their profits.*

QUESTION 11.—CROPS.—(a) (i) Apart from the improvement of crops by the introduction of better cultural methods, use of suitable manures, etc., which are dealt with under other sections of this questionnaire, the improvement of existing crops depends upon the *production of improved varieties and their general adoption by the cultivators.*

The improvement of crops takes place therefore in two stages each of which presents its own problems and its own difficulties.

The first stage, i.e., the production of new and improved varieties, is the work of the plant breeder and the experimental station; the second stage, the adoption of these improved varieties by the cultivator, calls for the district demonstrator and the organiser.

What crop improvements make the greatest appeal to the cultivator? In my opinion, they are in order of importance—

- (a) *Higher yields.*
- (b) *Better quality.*
- (c) *Suitability for special environmental conditions.*

The introduction of a *higher yielding variety* of an existing crop is the *easiest form of improvement* to popularise among the cultivators. It makes an immediate appeal by reason of the facility with which the advantage of the improvement is translated into *increased profit to the grower*. For instance, the introduction of N. R. cotton (*neglectum roseum*) into Khandesh has been most successful as the increase of yield of lint per acre is estimated to give an additional profit of Rs. 7 per acre over the ordinary local mixture. This, too, inspite of the fact that its quality, i.e., staple length, is lower than the variety which it is replacing. The introduction of such an improvement necessitates for its success, a very *complete organisation for the provision of seed* to the cultivator, which is capable of extension as demand increases.

The work of the plant breeder and the botanical expert in evolving new and higher yielding varieties will lose the greatest part of its value and its economic importance unless the district officer and organiser is simultaneously building up his organisation for the provision of seed of the improved crop to the cultivators.

In addition, arrangements must be made to *maintain the standard of improvement* which the original introduction offered. If this standard is allowed to become lower year by year by mixing in the fields, deterioration, cross-fertilisation, etc., without the provision of an annual *renewal of stock seed of the highest quality*, the tendency will be for the improved variety to lose its distinctive qualities and return to a general level of mediocrity.

The introduction of a *better quality variety* of an existing crop demands the same precautions as in the case of the introduction of a higher yielding variety with this addition that the organisation must go beyond the mere provision of an adequate seed supply to the cultivators and *must be extended to ensure that the grower receives, in marketing his crop, the additional price to which its superior quality entitles him.* This is specially important in the early stages of introduction and is, indeed, the only means whereby many introductions of better quality crops can be permanently established. Take, for example, the work at present going on in the direction of obtaining a better-stapled cotton for Khandesh. The work of the plant breeder has resulted in the production of a variety which is very greatly in advance of any variety at present grown in Khandesh with regard to staple but which shows no improvement in yielding capacity. The introduction of this improved and better quality variety will only be successfully accomplished if—

- (1) cultivation of the new variety is organised in *pecially selected centres* from which an outward spread can be established.

- (2) adequate arrangements are made to market the superior lint in such a way as to obtain an *adequate premium* for quality to the grower.

The introduction of improved varieties, *i.e.*, varieties more suited to special environmental conditions, *e.g.*, wilt resistant cotton, drought resistant *bajri*, etc., might also be included under higher yielding varieties as the fundamental importance of such improvements is to give a higher yield to the cultivator under special conditions of environment which reduce the yield of the ordinary crop. In this case, however, special attention has to be given to *demonstrations on the cultivators' fields* with the object of convincing the grower that his losses from the special factors which are reducing his crop yields can be considerably reduced by cultivating a variety which has been found to be more suited to the peculiar nature of the conditions under which it is to be grown.

To summarise, the improvement of existing crops is the combined work of the plant breeder and the district organiser.

The plant breeder must—

- (1) have adequate scientific equipment,
- (2) a definite problem to work on, and
- (3) realisation of the actual conditions under which the improved variety will be grown by the cultivator.

The organiser must—

- (1) be prepared to meet the demand for the improved variety by an adequate organisation for seed supply,
- (2) arrange for assisting growers of better quality crops to obtain the best price for their produce, and
- (3) demonstrate the advantages of the improvement amongst the cultivators who could adopt it with the greatest profit to themselves.

In my opinion, the methods of technical crop improvement which are most likely to prove successful are, in order of importance—

- (1) By selection within existing varieties.
- (2) By hybridisation, after all the possibilities of selection are exhausted.

(ii) The introduction of new crops, including new fodder crops, is, to my mind, quite an unimportant matter, which, at the present time, is not in the least likely to benefit the Indian cultivator. There is so much to do and such an immense field for work in the improvement of the staple Indian crops from the agricultural and the botanical point of view and the possibilities of increasing the fodder supply of India, without recourse to imported fodder crops, are so great that I consider all time and money should be concentrated on these matters alone.

(iii) As I have mentioned above, the distribution of seed is a most important consideration in the introduction of an improved variety of crop. There are many agencies through which such distribution can be carried out, and in different parts of the country different methods have proved most successful.

In Khandesh, the original distribution of N. R. cotton seed was entirely carried out by the Agricultural Department but, with the development of co-operative enterprise in the district, it has been found very advantageous and profitable to entrust the bulk of distribution to co-operative agency.

Roughly the present system is as follows:—

- A Taluka Development Association or a large co-operative credit society appoints a few of its members as "seed growers". These members are supplied with seed of the improved variety

by the Agricultural Department from the Government seed farm at Jalgaon. The "seed growers" grow the improved crop under the supervision of the Agricultural Department and their Association. One half of the total seed produce of their crop is taken by the Association or society, at a price approved by the Agricultural Department, and is distributed to other members in the next year. The other half remains the property of the seed grower to dispose of as he wishes. It is generally sold to other members of his Association or society. In this way centres for the growth and distribution of N. R. seed have been formed in the district. In addition, the Agricultural Department supplies seed to two or three official "seed growers" and similarly one half of their seed produce is repurchased by the department and sold to Co-operative District Banks who supply it on indent to their constituent co-operative credit societies in the villages.

These systems of distribution have worked well and are proving effective in enabling even the small cultivators to get supplies of improved seed for cultivation.

I am strongly in favour of the work of seed distribution being *entrusted as completely as possible to co-operative and non-official agencies*. The Agricultural Department should assist in this work by providing an annual supply of pure seed to seed growers and by assisting in the "roguing", and maintenance of purity of seed growers' crops in the fields, but should not undertake the actual distribution from seed stores or depôts.

(c) The gradual development of ground-nut as a cultivators' crop in Khandesh from 4,119 acres in 1912-13 to 140,190 acres in 1924-25 has largely resulted from the use of quick-growing varieties of high oil content (Spanish peanut) by the Agricultural Department.

This development is important in many ways. Firstly, the better variety matures earlier and allows the cultivation of a succeeding *rabi* crop if desired. Secondly, it is worth more per acre than the local ground-nut variety and is a most excellent rotation with cotton. Thirdly, it is an equally valuable crop to grow as a substitute for cotton.

The cultivation of N. R. cotton is also an extension which has resulted in much profit to the Khandesh cultivator and it is grown over lakhs of acres in both the East and West Khandesh districts. The demand for seed of this variety is annually at least twenty times more than the available supply from all sources although this difference is gradually being reduced by the co-operation of Taluka Development Associations, Co-operative Banks, etc., in seed distribution.

QUESTION 12.—CULTIVATION.—(i) The improvement of tillage and crop cultivation has always been one of the *most important* items of district propaganda in my late Division (Nasik and Khandesh). There is *no other improvement* which would result in *so great or so rapid an increase in the yield of crops* or which would cost less for the cultivator to adopt. The improvements in tillage, with special reference to the cotton crop, which the Agricultural Department has been endeavouring to introduce in Khandesh are:—

- (i) Ploughing of the land immediately after harvest and deep harrowing.
- (ii) Two or three good ploughings and cross harrowings before sowing, in order to prepare a good seed bed.
- (iii) A series of interculturings during the early stages of growth to mulch the soil surface and conserve soil moisture.

The existing practice in the district is to leave the land untouched from the harvesting of the last crop until shortly before the commencement of the sowing season. Then the land is roughly harrowed—in some cases

shallow ploughed with wooden plough—and seed is drilled after first rains. Interculturing is done only in a few cases after germination and the start of growth. The average yield per acre of cotton on Jalgaon farm during the past seven years is 572 lbs. of kapas per acre. I estimate that the average yield of an average cultivator growing cotton on similar land over the same period of time will not exceed 300 lbs. of kapas per acre. 50 per cent of the difference is, in my opinion, due to the improved cultivation of the farm alone.

The improvement of cultural methods in Khandesh really resolves itself into the timely preparation of a well-tilled seed bed and the cleaning of the land from deep-rooted weeds. The practice of interculturing the crops is becoming more and more common in Khandesh and I believe that the next few years will see a great improvement in field tillage in this part of the Bombay Presidency.

What is now required is continuous demonstration and propoganda combined with the organisation of a supply of suitable tillage implements at a cheap cost.

I once made the suggestion at my Divisional Board meeting that a greater advance in the adoption of good tillage methods and improved cultivation of the soil would be made if the Revenue Department could co-operate to a greater extent in measures tending to induce cultivators to improve their standard of cultivation. My idea was that rebates on land assessment fees should be granted to cultivators who obtained "good tillage certificates" from the local senior officer of the Agricultural Department. Such rebates would be for one year only and would be limited to a definite number of cultivators in each taluka. Any loss to Government would be fully compensated by the gradual rise in the standard of farming which, I believe, would result from this or some such similar measure of encouragement. Another important factor in promoting good tillage is the ready supply of improved tillage implements in the villages at the cheapest rates. As this matter is dealt with under another section of the questionnaire, it need not be further commented upon here.

(ii) With regard to existing rotations of crops, the only improvement which seems eminently desirable at the present time is the increase of the part played in rotations by leguminous plants, especially in tracts where the supply of organic manures is deficient. The cultivation of the ground-nut crop in Khandesh, which has extended so considerably during the past decade, is of great importance in the general agriculture of that district on this account.)

The present rotation on Jalgaon farm, which is pre-eminently a seed farm for the production of N. R. cotton seed, is:—

1st year—Cotton.

2nd year—Cotton.

3rd year—Either *kharif* crops, e.g., *jowar* and *udid* or ground-nut or *rabi* crops—wheat, grain or coriander.

The 1st year cotton gets one of the following manurial treatments:—

(a) 15 cart loads farm-yard manure per acre.

(b) Sheep folding (2,000 per acre for one night).

The 2nd year cotton gets 300—400 lbs. castor cake per acre.

The 3rd year rotation crops are unmanured.

From experiment, it was found that cotton after ground-nut yielded, over a period of six years, roughly 280 lbs. more of kapas per acre than cotton after *jwar* and that the average profit per acre of the combined crops was—

	Rs.	} two-year cycles
<i>Jwar</i> and cotton	86	
Ground-nut and cotton	174	

It is a very difficult matter to continue any intensive propaganda in the districts on the advantages of special crop rotations but evidence is not wanting, especially in the "patasthal" areas of Nasik and West Khandesh districts where large areas are under communal irrigation, that the advantages of suitable crop rotations are not neglected by the cultivators.)

QUESTION 14.—IMPLEMENTS.—(a) Wherever and whenever possible, the improvement of existing agricultural implements is preferable to the introduction of new types.

There is practically no agricultural operation which is carried on in general farming practice in the districts where greater efficiency could not be obtained by the improvement of the indigenous implements in use. Such improvements must be cheap and easily effected in the villages.

In my late district of Khandesh, I formed, shortly before my departure, a small committee composed of non-official gentlemen and experienced members of my staff to consider all local agricultural implements and to make suggestions for their improvement. The report of this committee was to be sent, along with a sample of each implement referred to therein, to the Agricultural Engineer, Poona. I consider that a series of local enquiries of this type would supply valuable material which could be considered and discussed by the Agricultural Department in consultation with implement manufacturers and a programme of improvement commenced.

(b) (1) There are two distinct stages in the system whereby improved agricultural implements are brought into common use amongst the cultivators of a district. After the Agricultural Department has made sufficient tests of the implement and is satisfied of its suitability for a certain tract the first stage is *demonstration*. By that is meant the actual working of the improved implement on the fields of the cultivator, who is invited to come and form his own opinion. The second stage is *organisation*, which includes the necessary provision of facilities to the cultivator, to hire or purchase the implement for his own use.

These two stages are quite separate, though they may be going on at the same time, even in the same talukas.

It would be easy, in the case of the extension of improved implements, to sub-divide the talukas into "demonstration" talukas and "organisation" talukas and indeed that is what unconsciously is done, in outlining programmes of work.

The main difference between these two stages of extension is to be found in a consideration of the agencies which are, or should be, responsible for the work.

Demonstration is primarily the work of the Agricultural Department, assisted by manufacturers, non-official bodies and other departments of Government.

Organisation is not the work of the Agricultural Department but should be carried out by the suppliers and by co-operative organisation amongst the consumers.

(2) The extension of improved agricultural implements in my late Division has made rapid progress. The Division was formed in 1921-22. Every year since that time, the department has continued to intensify its propaganda work in the extension of improved implements. The "demonstration" stage has been adequately dealt with in practically every taluka in the Division. In 1921-22, Rs. 2,143 worth of improved implements were purchased through departmental agency. In 1923-24, this figure has risen to Rs. 14,000. In 1924-25 it is gratifying to report a decrease in this figure, due entirely to private individuals and agencies and co-operative bodies undertaking this work. Receipts from the hire of implements from the departmental depôts have risen from Rs. 435 in 1918-19 to Rs. 1,870 in 1922-23. During the past two years, a gradual decrease is again due to the activities of private bodies in this direction.

It does not seem too much to expect that, in a few years' time, the Agricultural Department, except in a few backward talukas where missionary work is still necessary, will be able to relinquish the organisation work in connection with the extension of improved implements, to non-official agencies who should be better fitted to deal with it.

The testing of improved implements, their adaptation to particular sets of conditions, and their demonstration to the public will always remain an important part of departmental work.

(3) It would not be out of place to mention here the prominent part which Taluka Development Associations have played in the demonstration and organisation of supply of improved agricultural implements to the cultivators. In 1921-22 there were only about six Agricultural Associations in Khandesh and two in Nasik districts who took any part in this work. The total receipts from hire charges did not exceed Rs. 700. In 1924-25, there were eleven Taluka Development Associations, whose officers conducted over 250 plough demonstrations in the Division and whose receipts from plough hire averaged almost Rs. 200 in the year. Some of these Associations also gave ploughs free for trial to their members.

To assist these Associations in this work, the department arranged to supply them with ploughs on the instalment system, one-third of the total price to be paid on receipt of the ploughs, one-third after one year, and the remaining third after two years.

It is gratifying to note that every Taluka Development Association in this Division has taken advantage of this facility and that 92 ploughs worth Rs. 3,200 have been supplied on the above system. All instalments are being repaid regularly as they fall due. As a matter of interest, the 92 ploughs above are of the following makes:—

Kirloskar 100	56
Kirloskar 9	7
Kirloskar 15	8
Kirloskar 11	2
Watandar No. 120	2
Ransom C. T. 1	6
Ransom B. T. 2	7
Others	4

(4) This work which is being done by Taluka Development Associations has rather usurped the functions of non-credit societies and there is not much to report on the part played by implement societies in the Division. The future of such implement societies would appear to be most promising if they undertake the business of co-operative purchase of expensive implements and power machinery on behalf of their members.

It is interesting and gratifying to note that the business of hiring ploughs and agricultural implements is being largely taken up by private individuals. That such work is profitable cannot be doubted and, under personal management, a return of 10—12 per cent on the capital utilised should be easily obtainable.

(5) In conclusion, I would like to express my opinion that a great deal more could and should be done by the manufacturing firms and their agents in the work of extending improved implements. To limit their activities to supplementing departmental and non-official work and to the production and distribution of literature seems to me to be a short-sighted policy. Kirloskar Brothers have, I know, extended their agency system throughout the Presidency. Other firms are following suit. I would however be glad to see a demonstration campaign inaugurated by some enterprising firm, itinerant demonstrators despatched through the country districts and some intensive effort made, quite unofficially, to increase sales in a particular district.

- (6) Proposals for further extension of improved implements:—
- (1) A taluka census of the number of improved agricultural implements, iron ploughs, cane mills, etc., actually in use in each taluġa in the Division should be taken.
 - (2) The Agricultural Department should adopt the policy of placing implement depôts and conducting implement demonstrations only in backward talukas or where there is no other agency for the purpose. At all depôts, farms, Agricultural Overseers' offices, etc., a small stock of spares for the most popular types of ploughs, etc., should be kept.
 - (3) Itinerant demonstrations should be arranged during the ploughing season, especially in areas where further extension of the iron plough is desirable.
 - (4) Taluka Development Associations should be encouraged to stock more ploughs on the instalment system for hiring to members. Each Taluka Development Association fieldman should hold, at least, 60 plough demonstrations during the year.
 - (5) Co-operative Credit Societies should be permitted to stock a few ploughs for sale, on instalment system, to members. Each Co-operative Credit Society should be asked to arrange for a meeting of members once during the year, when a demonstration of the iron plough can be given by the departmental staff.
 - (6) The formation of co-operative distributive societies should be encouraged and the supply of improved agricultural implements should form part of the business of such institutions.
 - (7) Every encouragement should be given to manufacturing firms and their agents in the extension of their goods in the districts. This can be done by notification of gatherings of cultivators, arrangements for tests and assistance in placing articles for sale on consignment account with co-operative bodies, etc.
 - (8) As good cultivation is a *sine qua non* to good crops, the department, Taluka Development Associations and credit societies should only appoint as registered seed growers such cultivators as are in the habit of using improved implements for tillage purposes.
 - (9) Leaflets should be prepared, in the vernacular, on each type of improved agricultural implement, illustrating its use and giving the current prices and sources of supply of the most suitable makes. These leaflets should be distributed in the villages through the agency of the Revenue Department.
 - (10) An inquiry should be made to find out to what extent, the extension of improved agricultural implements is being restricted by lack of, or an inferior service of, spares, etc. The result of this inquiry should be published.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) In Nasik and Khandesh, there are at least six important breeds of cattle. These are:—

- (1) Tapti Khillari,
- (2) Sonkheri,
- (3) Nimari,
- (4) Khargundi,
- (5) Malvi,
- (6) Dangi.

Two non-official associations, Shirpur Agricultural Association, West Khandesh, and Jamner Agricultural Association, East Khandesh, started breeding farms for two of these breeds, the Tapti Khillari and the Khargundi respectively. The Tapti Khillari herd at Sangvi Cattle Breeding Farm,

Shirpur, West Khandesh, is one of the finest pure-bred cattle herds in the Presidency.

To improve the breeds of the Division, action on the part of Government is absolutely necessary—

- (a) To investigate the *sources of supply of good breeding bulls* of the above-noted breeds and to make arrangements for their placing on the "premium" system with approved cultivators.

It is a great hindrance to the extension of cattle improvement in Khandesh and Nasik that no adequate source of supply of breeding bulls of the chief breeds is available.

In addition to the above works, steps should be taken to compile lists of owners of good *cows* of these breeds, which would be suitable for breeding purposes. The advantage of such information would be to enable the fullest use to be made of good bulls, either by stationing them in suitable centres or by planning out itineraries for service purposes.

- (b) To encourage, to a much greater extent than is done at present, the *formation of co-operative cattle-breeding societies*, by granting forest grazing areas on concession terms.

Co-operative cattle-breeding is a subject which is arousing considerable interest in Khandesh and I have received many inquiries dealing with proposals of this type. Essential conditions to the success of such schemes are the segregation of a good grazing area for the herd and careful selection of a first class breeding bull. There is a considerable disinclination on the part of forest officers to reduce forest revenues by granting sole rights of grazing over forest grazing coupes at concession rates to such societies. I am of the opinion that, provided the members of such societies are prepared to *enclose their special grazing area* and to follow the advice of livestock experts in *selecting the female stock*, a first class breeding bull should be supplied *free* by Government and the Forest Department should be prepared to forego the loss of revenue which such schemes might entail. In the sum, such losses could only amount to a very inconsiderable amount, and the result of schemes of this nature would be of inestimable value to the cultivators.

- (c) To increase the staff under the *Livestock Expert* to Government in order to provide at least *one livestock officer* for each Division of the Presidency.

This measure should be supplemented by the formation of *Divisional Cattle Committees*, largely non-official in character, who could discuss and direct the livestock policy of the Division. Such a Committee would be invaluable not only in the execution of its official duties but as a means of interesting big landowners in the improvement of livestock.

- (d) To increase the supply of *trained practical cattle men* of the "Kangar" type who would be available for employment under co-operative cattle-breeding schemes or under private owners of herds of improved cattle. Suitable men could be selected from the districts and trained on one or other of the larger Government cattle farms in the practical care of cattle and other livestock. The herd of Tapti Khillari, maintained by the Shirpur Agricultural Association, was suffering badly from lack of such skilled attention and, although efforts were made to obtain an efficient working manager, they were not successful.

(b) (i) Overstocking of common pastures, e.g., village waste lands, etc., is considerably intensified, as a source of injury to cattle—

- (a) by the poor *sparse covering of inferior grass* generally found on such places,

(b) by the large proportion of *unthrifty and worthless cattle* which graze upon them.

I suggest efforts should be made to *improve the quality of the better type of village common lands, by the introduction of better grasses combined with a system of rotational grazing.* This would require co-operation of the villagers and might be attempted, in the first instance, where such co-operation is offered.

(ii) I do not think that there is much hope of increasing fodder-supply by *any considerable augmentation* of enclosed pasture land. Grazing on grass borders in tilled fields is a common practice but, in Khandesh at least, enclosed pastures are most uncommon. The planting of such perennial fodders as Guinea grass along the borders of water channels might be valuable in some irrigated districts.

(iii) There is no doubt but that the use of dry fodders, *e.g., kadbi, straw, etc.,* could be carried on to much greater profit and advantage if the cultivators could be induced to *prepare the material in a suitable manner before feeding it to their cattle.* I believe that, at least, *25 per cent of these materials are wasted* when they are fed to cattle *without being previously shredded or chaffed.*

In Khandesh, the increase of the ground-nut crop should provide a valuable additional source of fodder. The haulms and leaves, however, are very brittle when dry and must be removed from the field and stacked immediately after harvest.

(iv) The absence of green fodder in dry seasons must be specially injurious to dairy cattle. On unirrigated holdings, silage seems to be the only alternative measure.

(v) I do not think this is important although I would advise cattle-owners to allow their animals access to salt or include that substance in their feeds from time to time.

(c) (In Khandesh, fodder shortage is most marked in the months of March, April, May and June, and sometimes July.) Scarcity of fodder may be said to exist for 12—14 weeks. After this period of scarcity, about 3—5 weeks are necessary before growing cattle begin to thrive on the fresh abundance of fodder which comes in with the rains.

(d) Before I left Khandesh, I had laid out a scheme for work on the fodder problems of the district. The main points of this scheme were:—

- (1) Provision for careful and detailed investigation into successful schemes of *co-operative fodder storage* in the Presidency with the object of introducing and organising similar work, adapted to the special requirements of Khandesh.
- (2) Propaganda in favour of schemes of *co-operative fodder storage* in those parts of the Division where such work would be most useful.
- (3) Construction and demonstration of "*kutchra*" silo pits and silage making at several selected village centres.
- (4) The erection of a "*pucca*" silo at Jalgaon farm, East Khandesh, to demonstrate the manufacture and use of silage.
- (5) The wide demonstration of *hand power chaff-cutters* in the district and the provision of facilities for the supply of these implements, *on part payment system,* to cultivators desirous of using them. Tests of different types of chaff-cutters manufactured in India were also to be made at Jalgaon farm.

If facilities had been available, I would also have added:—

- (6) A *complete investigation* into cultivated fodder crops in the Division with the object of working out a *system of intensive cultivation,* giving the highest yields from the minimum area, and suitable for cultivators' practice.

In addition to the above, I would like to suggest that *co-operative bodies* such as Taluka Development Associations, large co-operative credit societies, etc., might consider the possibility of *taking a forest grass or grazing area on co-operative lines*. Much of this business is in the hands of contractors who make considerable profits. When such forest facilities are auctioned or otherwise disposed of, certain coupes might be offered at concession rates to encourage co-operative enterprises of this kind.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—I do not propose to offer detailed replies to the sub-heads of this question which deals with subjects to which I have not been able to give particular attention or study.

(With regard to subsidiary industries to agriculture, the chief source of revenue for the Khandesh cultivator, apart from his agriculture, is the hire received for the use of his carts and bullocks when not required for his own purposes.)

The development of other subsidiary industries appears to me to be *directly dependent upon the progress of the co-operative movement*. I do not think that isolated attempts at starting such industries are likely to succeed as cultivators will not be prepared to undertake the purchase of raw materials and the disposal of finished produce on their own account.

A great deal of educative work has yet to be done before any great expansions in this direction can be hoped for.

✓ QUESTION 20.—MARKETING.—(a) and (b) Under this head, I desire to confine my evidence to *cotton marketing in Khandesh*. I do not consider the existing market facilities and system of marketing to be satisfactory.

There are two chief methods by which the cotton-grower in Khandesh disposes of his *kapas* :—

(a) By sale to itinerant petty dealers in his village.

(b) By sale through “*adatyas*” or brokers at some recognised market centre.

Of these two methods, the first is by far the most common and popular.

(NOTE.—A recent enquiry into cotton finance in Khandesh showed that out of 806 cultivators whose sales were investigated—

680 (84·4 per cent) sold all their *kapas* in the villages.

97 (12 per cent) sold all their *kapas* at a market through a broker.

29 (3·6 per cent) sold some *kapas* both in village and at market.

Only 26 cultivators ginned their cotton and sold lint.)

In my opinion, the reasons for the preference shown to village sales are :—

✓ (a) Convenience and absence of trouble connected with carting to market and selling there.

(b) Difficulties in getting the price agreed in market sales, owing to disputes about quality and weight, etc.

There is no reason to believe that village sale is to any great extent necessary on account of financial indebtedness of the cultivator. The rates obtained in the markets are, on the whole, considerably higher than those given in the villages and this fact is well known to the cultivators but, under present market conditions, is not a sufficient inducement to give up village sale and take their *kapas* to the market.

Khandesh cotton markets.—There are about 35 established cotton markets in Khandesh, the chief of which is Dhulia, West Khandesh. The system of sale is everywhere much the same. Carts gather in the early morning, *dalals* are fixed and show samples to merchants, bids are made *under cover* and the seller accepts a rate. No memorandum of sale is given at this stage. The carts are then removed to a ginning factory designated by the buyer where the *kapas* is weighed. *After this*, a memorandum of the weight and rate is given to the cultivator who collects his money at the *dalal's* office in the evening. Payment is generally made on the day of sale and the cultivator can go off to his village at nightfall.

Prices and rates.—The daily rates are fixed by the merchants and *dalals* and are based upon telegrams giving the previous day's closing rates in Bombay. These telegrams are not posted up in the markets and the rates are not known to the average seller. It is doubtful, however, whether such knowledge, under present market conditions, would be of much use to him.

Storage.—There is no storage accommodation for *kapas* in any of the markets. In some centres, merchants and *dalals* can get storage accommodation in the compounds of ginners and press houses.

Weighments.—Commonly weighments are all made in the compounds of the ginning factories on Avery Beam balances. In some markets, platform balances have been installed but these are distrusted by the cultivators. I do not think that much loss is caused to the cultivators by incorrect weighments. The weighmen are usually servants of the broker or *adatyā*.

There is no definite standard of weights which vary in different markets, e.g.,—

West Khandesh—

(a) Dhulia	1 Maund = 72 seers.
(b) Shirpur	1 Maund = 50 seers.
(c) Navapur	1 Maund = 40 seers.

East Khandesh—

(a) Pachora	1 Maund = 80 seers.
(b) Amalner	1 Maund = 72 seers.
(c) Jalgaon	1 Maund = 48 seers.
(d) Edlabad	1 Maund = 22 seers.
(e) Bodwad	1 Maund = 21½ seers.

There are similar variations at other market centres.

N.B.—1 seer = approximately 2 lbs. (avoir.).

Allowances and deductions.—The rates of special market allowances and deductions vary considerably from place to place. The average payment made by the cultivator on this account amounts to approximately Rs. 2 per cart or 3—4 annas per large maund.

The chief complaint of the growers with regard to the present market conditions is that the rate fixed at the time of sale in the market is very seldom the rate actually received owing to "Vandhas" or disputes about quality, weight, etc., of the *kapas* after weighment in the ginning factory compound. In such cases, the cultivator has no option but to accept the reduction which generally amounts to 4—8 annas per maund but may be much higher.

(Note.—In the course of the investigation mentioned above, 79 out of 97 cultivators who sold their cotton at market centres stated that they had suffered loss by reductions on account of disputes after weighment.)

Improvement of Khandesh cotton marketing.—In my opinion, the improvement of cotton marketing in Khandesh can be brought about by—

- (a) The organisation of regulated cotton markets with open prices, controlled and managed by Market Committees which include a large growers' representation and the introduction of definite market rules and by-laws. I understand that a draft Cotton Markets Bill for the establishment of open cotton markets of this nature and constitution is under the consideration of the Government of Bombay.
- (b) The development and extension of co-operative cotton marketing, especially in conjunction with co-operative cotton ginning and sale of lint.

The essentials to the success of such societies are that the working system adopted should be suited to local requirements, that the volume of business controlled must be large enough to influence the market, that

producers only should be members, that a system of grading produce be adopted and that management should be expert and efficient. In addition, the society should avoid incurring the hostility of *dalals* and merchants and be willing to conduct its business with their help and through established agencies.

QUESTION 22.—CO-OPERATION.—(a) In my opinion, the *only hope of any general rise of the standard of living in rural India depends entirely upon the development of the co-operative movement.*

Apart from the agricultural research work carried on by the Agricultural Department and the urban co-operation work of the Co-operative Department, the remaining activities of these two departments of Government could profitably be combined in a *Rural Development Department* and organised and carried on as an indivisible and complete organisation for the development of rural India.

If this had been done originally, all agricultural research work could have been conducted by an All-India organisation and we would now be hearing less about the function of such an organisation under the present system. However, as things are, I am firmly convinced that the rate of agricultural progress and, indeed, of general rural uplift, in any Province, will, in the future, largely depend upon the extent to which working co-operation between the Agricultural and Co-operative Departments can be achieved and on the ability of these two sister departments to enlist *non-official interest and assistance* in their common task. Government can assist the growth of the co-operative movement—

(1) By providing very much larger funds for its development than have hitherto been granted and by expending these funds, not only through the agency of a Co-operative Department or non-official co-operative institutions but through *every* agency which is capable of extending the movement among the cultivators.

These funds should be devoted to educational and propaganda purposes.

(2) By enabling all its officers working among the rural communities to obtain sufficient knowledge of the co-operative movement to fit them for propaganda work on its behalf in the districts. In this connection, facilities for personal study of the co-operative movement in other countries are important. In addition officers of the Co-operative Department should be in possession of a certain amount of agricultural knowledge, not necessarily sufficient to make them capable of giving expert advice, but certainly enough to ensure their appreciation of the practical agricultural problems of the district in which they are working.

(3) By encouraging cultivators to become members of co-operative societies, both credit and non-credit, by granting concessions, facilities, exemptions, etc., to these societies, *but not money.*

(4) By assisting non-official co-operative bodies in management and supervision in the initial stages and by fostering independence by withdrawing such interest when it appears to be no longer required.

(5) By collecting information and diffusing knowledge of the working of the co-operative movement in India and in other countries of the world.

Government should *not* take any active part in the organisation of co-operative societies. I have experienced the results of such authoritatively organised societies in Khandesh and Nasik and the result is *almost always* failure and liquidation, resulting in a set-back to the movement in the locality. Likewise Government should *not* give direct subsidies to co-operative societies although many enthusiastic and keen co-operators will disagree. For instance, Government subsidies up to a maximum of Rs. 1,000 and equivalent to the amount raised by local subscriptions are given annually to Taluka Development Associations. The result is that now these associations, in many cases, are appealing for larger donations from Government to extend their activities, instead of increasing their resources by adding to their membership as the result of village to village propaganda in their area. If any such subsidy is given to a new society at its beginning,

it should be definitely earmarked for organisation and not utilised for any other purpose.

Non-official agencies can best encourage the co-operative movement by—

- (1) Organisation.
- (2) Propaganda and education.

In this connection, I would remark upon the excellent work done by the Bombay Central Co-operative Institute and its branches in the districts, which cannot be too highly praised. Every member of a successful co-operative society becomes a disciple in the movement and it is a great pity that it is not possible to utilise the villagers of such a village as Hadapsar, near Poona, on missionary tours on behalf of the co-operative movement throughout the Presidency.

A great hindrance to the extension of the co-operative movement in many villages is the existence of "factions" in the village. The special difficulty encountered by co-operative missionaries in such cases is that while one faction is anxious to form a society, the other as a matter of course is opposed to it. The society is formed and naturally fails. Non-officials with influence in the districts could do much if they were to endeavour to reconcile the opposing parties and pave the way for common agreement in such places.

(b) I desire to offer evidence on the following types of co-operative societies only:—

- (1) Purchase Societies.
- (2) Cotton Sale Societies.

(1) *Purchase Societies.*

Distributive co-operative societies and stores in relation to the present economic situation in Khandesh.—In Khandesh, the development of agriculture is accelerating. There is an increasing demand for agricultural requisites among the cultivators. This demand is specially noticeable in the case of manures for the cotton and sugarcane crop, better seeds for sowing and improved implements of tillage. Certain materials, which were formerly deemed luxuries, are now looked upon as necessities. It appears reasonable to anticipate that this demand will continue to increase and will extend to cover articles, not purely agricultural, but including domestic and industrial requirements.

What is being done to meet this demand? What facilities are being made available to the cultivators to assist them to obtain, at reasonable prices, agricultural requisites of good quality and guaranteed standard?

Government, by the institution of implement depôts, etc., are doing a little; the suppliers and manufacturers in the trade, even less. The great potentiality of *co-operative organisation* in this matter remains unexplored and the few tentative efforts which have been made, have, often than not, resulted in failure and set-back. In most other countries, where co-operative distribution has developed to any great extent, its origin can be traced to a realisation of the necessity of co-operative action as a defence against the exploitation of increasing demand on the part of the supplying trade. Such realisation results from education. I am doubtful whether this stage has yet been reached in Khandesh. If goods are found too dear or of inferior quality, the tendency will be, not to organise for improvement, but to discontinue their use altogether.

In this fact lies the necessity for official propaganda and even for official organisation. All the research work of an Agricultural Department is futile unless the results of such research are definitely incorporated in common agricultural practice. In India, this can only be done, on an effective scale, by co-operation among the cultivators. The demand for such co-operation must be awakened from within by education and propaganda. Its translation into practice must be done in the first place under ex-

part official direction. The co-operative distributive movement will only extend, as it should, in the rural areas of India, when officials and non-officials combine, firstly, to arouse local interest and enthusiasm; secondly, to perfect organisation; and, lastly, to co-ordinate the interests of industry and agriculture in the stabilisation of the movement.

✓ *Distributive societies—the difficulties to be overcome.*—From consideration of the history of co-operative distribution in other countries and confirmatory evidence obtained from study of the many past failures in such organisation in India, the chief difficulties to be overcome may be summarised as under:—

- ✓ (a) *To ensure the loyalty of members to their societies or stores.*—This major difficulty includes many smaller ones. Amongst these are, the consideration of the suitability of any area, with reference to the common requirements of the inhabitants, for the organisation of a distributive society; the question of credit sales as against cash payments; the nature of business to be done and the financial interest of members.
- ✓ (b) *To ensure efficient business management.*—The technical side of management, professional or otherwise, the advertisement and general publicity policy of the society or store, and the realisation of an adequate annual turn-over.
- ✓ (c) *To ensure adequate control and supervision.*—This comprises consideration of the functions of Government in the movement; the determination of the size of units; adequate finance and a common financial policy and the education and training of organisers, workers and members.

Suggestions for the primary organisation of distributive co-operative societies and stores.—Space does not permit me to do more than give a very brief outline of what, in my opinion, might be done at once towards the organisation of distributive co-operative societies and stores.

Area of operation.—Distributive co-operative society stores should only be organised in areas where there is an assured and definitely increasing demand for, at least, one main type of agricultural requisite, e.g., Nasik district—artificial nitrogenous manures for garden and irrigated crops; East Khandesh—artificial manures for cotton crop and improved cotton seed.

The area of operation of a single society or store should be limited at present to four talukas. This is liable to extension as experience dictates.

✓ *Membership.*—The qualification for membership should be the holding of one 5-rupee share in the society or the membership of a co-operative credit society. All members, including shareholders, should pay an annual membership fee of Re. 1.

The privileges of membership will be the option of obtaining goods on cash payment or on a certain period of credit and a participation in the profits of the society by an annual bonus distributed according to the total amount spent in purchases from the store.

Capital.—Should be raised by—

- (a) Issue of 5-rupee shares to the public.
- (b) Members' annual subscriptions of Re. 1 per member.
- (c) Loans.
- (d) Donations and gifts.

No distributive society store should be started until Rs. 5,000 have been collected as share capital.

Management.—Each shareholder is entitled to 5 votes in virtue of each share in the society, which he holds. Each member is entitled to one vote. Thus a member holding 3 shares will be entitled to 16 votes at the Annual General Meeting.

An Annual General Meeting of all members will be held to appoint office-bearers, Managing Committee and non-official auditor.

An Advisory Board consisting of the Deputy Director of Agriculture, the Assistant Registrar, Co-operative Societies, and the Prant Officer will be formed and will attend personally, or by delegate, each meeting of the Managing Committee.

The Managing Committee will meet monthly and will appoint a paid store-keeper and will conduct the business of the society.

The District Agricultural Overseer of the district will act as honorary supervisor of the store and will report monthly to the Managing Committee and Advisory Board on its working. A paid store-keeper will be appointed on a monthly wage *plus* commission on the annual *profits* of the store. He should receive preliminary training in the work of the store, which should be arranged by the Agricultural and Co-operative Departments.

Any member of the Managing Committee or the Advisory Board can inspect the working of the store at any time. Such inspections should be arranged at the monthly meetings of the Managing Committee to take place at least once a week.

The society and store will be registered under the Co-operative Societies Act. The accounts will be audited half-yearly by the official auditor of the Co-operative Department in collaboration with the non-official auditor appointed at the Annual General Meeting.

Business.—The store will be empowered to deal in all agricultural and domestic requisites according to the discretion of the Managing Committee and Advisory Board. The store shall be open, *i.e.*, sales may be made to any one. Non-members must only be supplied on cash-payment, members on cash-payment or credit, if desired.

A list of articles, which if it is decided to stock in the store, should be sent, *with fixed prices*, to each co-operative credit society, at a definite time each half-year. These societies should be asked to submit members' indents and requirements, by a fixed date, to facilitate stocking and estimate of turn-over required.

It might be considered whether a certain percentage of the purchase price should not accompany these indents.

In the case of credit sales to members, recoveries should be made in three months' time through the credit societies to which they belong.

General.—The Agricultural and Co-operative Departments, with the assistance of interested non-officials, should undertake the organisation of these distributive societies and stores and the collection of share capital. A circular inviting membership should be sent to each co-operative credit society, who should be asked to forward a list of their members desirous of joining the store along with their annual subscription for the coming year. All annual subscriptions should be collected through the credit co-operative societies.

The Annual General Meeting should be convened by the Assistant Registrar, Co-operative Societies, and the Managing Committee, auditor and store-keeper appointed at that meeting.

The Managing Committee and Advisory Board should, at their first meeting, scrutinise indents, etc., and decide on the outlay of capital on stock, loans required, etc., etc. At each store a maximum and minimum schedule of stock should be prepared. Recoveries from members should be made through co-operative credit societies. The period of credit to be allowed should be fixed half-yearly by the Managing Committee and Advisory Board.

Profits should be disbursed, annually or half-annually, as under:—

- (a) Commission to store-keeper.
- (b) Interest on loans.

- (c) Dividend to shareholders.
- (d) Bonus on purchases made by members.
- (e) Reserve fund.

These will be fixed by the Managing Committee and Advisory Board and declared at the Annual General Meeting.

It is not possible to go into details of management, supervision, system of business, accounting, etc., in this note. The main principles, however, which should be followed, are shown above in a general way and include:—

- (a) Sale at usual trade prices (or slightly less to attract custom and patronage).
- (b) Cash sales only to non-members; cash or short-time credit (through co-operative credit societies) sales to members.
- (c) Distribution of profits in (1) dividends to shareholders, (2) bonuses to members, in accordance with total amount spent by each member in the store.
- (d) Membership confined to (a) shareholders, (b) members of co-operative credit societies.
- (e) Each shareholder, 5 votes for each share held; each member, one vote.
- (f) Shares on sale to the general public.
- (g) Control and management by members, through Managing Committee appointed at Annual General Meeting, and supervision and direction by Managing Committee, advised and assisted by Advisory Board and honorary supervisor.

(2) Cotton Sale Societies.

Khandesh is a very large cotton growing tract and produces annually about 3½ lakhs of bales. There are about 35 market centres in the district. Several attempts have been made to organise "Cotton Sale Societies" for the benefit of the cotton grower by securing for him fair dealings and better prices and to protect him against the inconveniences of the present marketing system.

The almost general result of these attempts has been failure and the only surviving society, at Pachora, East Khandesh, is not working on co-operative lines and does little more than secure fair weighing to cultivators who make use of it.

✓ The causes of this continued failure may be summarised in order of importance, as—

- ✓ (a) Inefficient management.
- ✓ (b) Hostility of merchants.
- ✓ (c) Lack of effective preliminary propaganda among the growers.
- ✓ (d) Inadequate finance.

In addition, the market rate of Khandesh cotton is liable to sudden variations and the cultivators are averse to hold or store their *kapas* in the hope of better prices. Further, as no superior qualities of cotton were offered for sale, there was no inducement for competition among buyers and grading was impracticable.

I do not see any prospect of successful cotton sale societies being established in Khandesh until considerable propaganda work has been carried out among the cultivators, efficient management and adequate finance provided through the agency of the Provincial or District Co-operative Bank and until a sufficient quantity of *superior* cotton is available to enable grading to be done and for sales to be made by auction through the agency of the sale society.

In the event of the introduction of a better staple cotton into the Khandesh tract, the sale society would not only be an advantage but a necessity to the growers of the improved type.

I would suggest that, in the meantime, preliminary propaganda be carried on among the cultivators and special consideration be given to the future financing of cotton sale societies in this important cotton producing area of the Presidency.

In connection with cotton sale societies, it may be mentioned that much interest is being evinced by cotton growers in Khandesh in the possibilities of organising *village co-operative cotton ginning societies*. I believe that such societies could be successfully organised and worked in several parts of the district and, as the sale of lint is more profitable than that of *kapas* and as commercial ginning charges are, in many places, very high, these societies would prove valuable and profitable organisations.

(c) I am of the opinion that resort to legislation to enforce co-operative action in schemes for joint improvement would not only be inadvisable but that, in the great majority of cases, will be found to be unnecessary.

My only experience of such co-operative schemes for joint improvement is in connection with fencing societies for the protection of valuable crops against wild animals.

While endeavouring to organise such a society in an irrigated (*patasthal*) tract of Nasik district, I found that local enthusiasm was inversely proportional to the distance of the villagers' lands from the outskirts of the area it was proposed to fence. The landowners on the boundaries were enthusiastic over the scheme whereas the cultivator who had the bulk of his holding in the centre of the "phad" evinced very little interest in the project. If recourse to legislation had been taken and "compulsory" co-operation resulted, I feel sure that the failure of the society could not be avoided. The method adopted was to suggest a graduated scale of payment, the outside owner—who suffered most—paying considerably more to the cost of the project than the interior landowner whose contribution was small. This suggestion was generally approved and, when I left the Division, the area had been surveyed and there was every prospect of a successful scheme resulting.

(d) I have no remarks to make in this connection except to draw attention to my views on the future organisation of agricultural co-operative societies as expressed on page 7 of the Report of Inquiries made into the Agricultural Co-operative Movement in Denmark (copy attached).*

* Not printed.

Oral Evidence.

7236. *The Chairman:* Mr. Jenkins, you are Deputy and Officiating Secretary of the Indian Central Cotton Committee, and you are late Deputy Director of Agriculture of the North Central Division, that is to say Nasik and Khandesh, of the Bombay Presidency. I understand that you do not wish to be examined in your capacity as Deputy and Officiating Secretary of the Indian Central Cotton Committee, on points other than those which you have set down in your memorandum. Is that so?—Yes.

7237. And you would rather that the Commission's special attention to the Central Cotton Committee should be directed to another witness. Is that so?—Yes.

7238. You have put in a very full and, if I may say so, interesting note of what you propose to lay before the Commission, and we are greatly obliged to you for that. Would you like, at this stage, to make any statement of a general nature, or would you proceed to question and answer?—I should like to proceed to question and answer.

7239. I think you have in your hand a note of your evidence?—Yes.

7240. On page 438, you are talking about the development of new varieties of wheat in the Tapti valley area in East and West Khandesh, and you say that such work, to be effective and to make an appeal to the Tapti cultivator cannot be done at Poona, or even at Jalgaon or Dhulia. You suggest that a small wheat research station could be started in the Tapti area and the problems of the local wheat crops studied and investigated. You suggest the figure there of Rs. 1,500 as the cost of such a small station. I can understand that demonstration must be local, but I do not quite see why research should be local. Would you develop that idea?—My sole idea was to interest the people in the district, where improvements are going to be introduced, in the methods whereby such improvements may be arrived at. At present, taking the same instance, the wheat crop, the plant breeder at Poona concentrates his wheat work at Poona. He sends up different varieties for trial and test in the District of East Khandesh and Nasik, and it is quite impossible to test them on any but the smallest percentage of the areas where we hope to establish better varieties of wheat; and I feel that in a case such as this, where one large crop is concentrated in a special area, the cultivators would be very much more inclined to adopt improved varieties and better methods of cultivation, etc., if they could actually see the effects of these from the demonstrations being worked out among them.

7241. And yet in spite of holding that view, you do not attach nearly as much value to demonstration farms as you do to experiments worked out on the cultivators' own fields?—I refer here to experimental work which is done on the fields of the cultivators. I do not advocate establishing an experimental farm; I advocate leasing a few acres of land for a short period and conducting the work among the cultivators on their own fields.

7242. Do you think that that could be carried out at the cost you mention?—I think it could.

7243. What do you contemplate, a house for the Director?—No, nothing like that. I contemplate leasing probably 15 to 20 acres of land, say, in Nandurbar, in the centre of the wheat-growing area, having a fieldman there in charge of the plot, and it would be supervised by my own plant breeder from Dhulia. There would be nothing on a large scale at all, merely a small station under identical conditions to those under which the cultivators work, where their problems could be worked out among them.

7244. In the light of that answer, how do you propose to spend your Rs. 1,500?—If we lease, say, 15 acres of land, at Rs. 30 an acre, and we had a fieldman on Rs. 30 a month, who would merely supervise and look after the plot, if we spend, say, another Rs. 300 on material and hiring of bullocks, and then an additional travelling allowance for supervision, I think we shall arrive at somewhere near that figure.

7245. On page 439, you say, "The ideal organisation of research work is, in my opinion, the present system of co-operation in cotton research between the Indian Central Cotton Committee and Provincial Governments." You go on to describe the outlines of the working of that scheme. Should I be right, if I suggested that continuity and co-ordination were the principal advantages gained by this scheme?—Yes, I think so.

7246. You attach great importance to an assured financial future for research work?—Yes.

7247. You cannot reduce and expand expenditure on research according to whether provincial budgets are easy or difficult?—I do not see how it can be done.

7248. In your experience has the scheme, as it has so far worked, led to correlation and co-ordination of work?—I think most decidedly it has.

7249. Has the degree of centralisation which it involves in any way restricted or narrowed the line of research?—No, not at all.

7250. You go on, as I said a moment ago, to apply this principle as a possible solution of the problem of organising provincial research. Have you gone a step further in your own mind, and applied this principle to research as an All-India problem?—Yes, I think I have mentioned that in my notes on Administration.

7251. You have, but I think it is convenient to take it up at this stage. You are, broadly speaking, in favour of the setting up of a Central Research Committee or Commission, or call it what you will?—Yes, not entirely confined to research.

7252. For agricultural progress in the widest sense?—Yes.

7253. Would you favour the development of research upon crops other than cotton being organised on the basis of the crop itself, and regardless of territorial boundaries?—Yes, I would, if it could be co-ordinated with the interests of the trade, and if the trade interested in that crop could be represented on the research committee controlling it.

7254. Of what crops are you thinking?—I am thinking of crops such as rice, jute, and wheat.

7255. I take it that all these crops, and indeed cotton, do present certain problems for solution which are of a purely local nature, and in your larger scheme you deal with these local areas?—Yes.

7256. But the major problems of more general application are dealt with according to expediency?—Yes.

7257. And the position of existing research stations and research facilities?—Yes.

7258. You attach importance, do you not, to representation on the cotton committee, or for example the jute or rice committee, if these existed, of the cultivator, the distributor, the manufacturer, and of course representatives of the Agricultural or other public Departments concerned?—I think it is quite essential.

7259. In your experience, the presence of these various interests on the Central Cotton Committee has resulted in a broad outlook over the problem as a whole?—There is no doubt about it.

7260. On page 440, in answer to question 1 (d), "Sheep-breeding for wool production," you say, "In Khandesh, the chief income from sheep farming is derived from folding. The immense improvement in the wool which selective breeding could accomplish in a very short period of time is quite uninvestigated, an important and valuable line of research for the livestock experts." There are two points about that. You say that the chief income from sheep farming is derived from folding?—Yes.

7261. What do you mean exactly by that?—The herdsmen in Khandesh are in the habit of travelling over the country with large flocks of sheep; in the commencement of the cultivating season they come down with these flocks to the agricultural lands, and they obtain a considerable income from

allowing these sheep to remain and to be folded on the lands during the night. At the Jalgaon farm, we folded a considerable area of the farm. We had 2,000 sheep per night on the farm at the rate of a rupee an acre per night. These sheep live on the land during the night or for two or three nights as required and their dung and urine fertilise the land and make it ready for sowing.

7262. Are these sheep receiving any ration apart from what they pick up on the land?—No.

7263. Is importance attached to the effect of the tread of the sheep on the land?—I have never heard of any importance being attached to that. The sole importance is the manure.

7264. Is it your suggestion that the cultivators should themselves take up sheep-farming?—In some of the hilly districts of Khandesh, I consider it would be profitable if they did; but to begin with, I would confine myself to these wandering herdsmen who form a large portion of the population on the fringes of the small hills surrounding the Satpuras.

7265. But do you suggest it would be possible for a nomadic shepherd to improve the breed by control?—He would have to have a settled herd for some time, in order to do that, and we would have to organise the marketing of his produce.

7266. It would be a good deal easier for the cultivator to improve the breed?—It would.

7267. How do they market the wool at present?—At present, I understand the wool is merely marketed in the large bazaars of Dhulia and such large towns in Khandesh, and, as far as I know, they do not get more than 12 annas to a rupee per fleece.

7268. Is it true that this wool is hardly segmented at all?—You get anything from stuff like goat's hair to very fine wool.

7269. You do get fine wool?—Yes.

7270. I suppose the goat's hair type is used for felting?—I am talking about examining these herds of sheep. You will find sheep with wool that resembles goat's hair and in the same herd you will find sheep with wool of quite a good standard.

7271. I was thinking of marketing. I take it some one does grade this wool sooner or later, because of course so-called wool which is in fact hair is useless for the ordinary purposes?—I suppose it is used for felting and stuffing.

7272. Do you know anything about the prices obtained for the wool in the markets available to the herdsmen?—I think 12 annas to a rupee per fleece.

7273. Have you traced the value of that wool any further in its course in the wholesale market?—I have not.

7274. Then, on page 440, you say, "Another point which is worthy of mention is the necessity of encouraging, and if necessary subsidising, non-official gentlemen who have facilities and are desirous of conducting small schemes of research work on their own farms, under the guidance and direction of officers of the Agricultural Department." What grade of officer would you suggest should be employed on that work?—The district agricultural officer and the expert officers who were at my disposal in Khandesh would be quite capable of doing that. As a matter of fact, in several cases we did do it.

7275. It does not mean constant attendance on the farm?—No.

7276. You just lay out the experiment, and rely upon the landowner to carry it out?—Yes. Many of these landowners are quite capable of conducting it without assistance.

7277. Are they capable of keeping records?—Yes.

7278. Did you find any encouragement necessary or were they really keen?—In Khandesh there are large numbers who are only too anxious to undertake the work.

7279. They are enthusiastic?—Yes.

7280. On page 440, you talk about the establishment of the Dhulia Vernacular Agricultural School, but you do not give your opinion as to the value of the work carried on at that school. Can you tell us anything about that?—This was the first effort at agricultural education of this type in the Division. The school was largely started through non-official agencies. The people of Dhulia pressed very strongly to get a school of this type founded, and they assisted considerably in its foundation. The school has now been running for three years, and I think there is no doubt that those boys who have completed the school course and who have returned to the land will, if suitably followed up, be very useful agents in the spread of agricultural improvements in the district. Further on I have mentioned that several of these boys have applied for *kamgars'* posts in the Agricultural Department; and I say that I have no objection to that, because I consider it a matter of primary importance that men of the *kamgar* type should be available both to the Agricultural Department and more so for the use of larger cultivators in Khandesh. I think it is rather early yet to say whether the school has really justified its existence or not but I certainly believe that every sign points in that direction.

7281. How do you reconcile your statement that the local cultivators called for the school with the fact that since it has been started, according to your own showing, it has been extremely difficult to get a full complement of boys?—It was not entirely the cultivators that called for the school; it was their educated representatives in Dhulia, members of the association.

7282. Have the members of the association, who called for the establishment of the school, taken a hand in encouraging their boys to go to the school?—Yes, very considerably.

7283. On page 441, you are giving your views about the openings available for these boys. Do you think that the absence of experience in farm management is a serious handicap to these boys when they go out into the world and try to obtain positions as managers and so on?—I do not think that is the sort of position which these boys would seek.

7284. How old are they, when they leave school?—About 18 to 20.

7285. Do you not think, if management posts were available, that would be an extremely suitable type of occupation for them?—I hardly think they are qualified for a manager's post even after the school training.

7286. Have you followed up the careers of those who have returned to their own land?—We were just starting to follow them up. I think they may be useful for propaganda work in the villages.

7287. Do you agree that in the working of these schools, each of which is an experiment, it is important that an accurate record of the after-careers of the boys should be kept?—I think it extremely important.

7288. You are not alarmed by the fact that a large proportion of the boys leaving the school are anxious to obtain public appointments?—No, I welcome it.

7289. That, of course, is in line with the experience in Europe and other countries, is it not?—I think education in other countries is generally directed on two lines, for boys who intend to return to their own lands, and for those who wish to seek employment other than on their own land.

7290. If you know the secret of education which makes boys return to their own land, I should like to know it, because we have not discovered it in Scotland yet. On page 443, you say you do not think much of the cinema for purposes of propaganda, unless it is backed up by other agencies?—No, or the magic lantern.

7291. Are you satisfied with the quality of the films that have been produced?—The ones I have seen are very good. The only ones I have seen come from America.

7292. Do you think in the matter of sanitation and hygiene there is an important future before the film without other agencies?—No.

7293. Why?—Because. I think the lesson which is taught by the film is not retained sufficiently long to have any real effect. It is more or less a fleeting impression and it is not retained by the ordinary cultivator beyond a very short period of time. I know it is a very difficult thing even for an educated person to recall the details of films, with presumably educational objects, which he has seen.

7294. On page 444, you say: "A great deal of progress in agricultural improvement could be made if more use were made of co-operative credit societies to organise field demonstrations for their members." To what extent are co-operative credit societies used as agencies for demonstration and education in your experience?—In my division of Khandesh I think very little use was made of them, not nearly as much as should have been. We were only starting to make use of this agency during the last year or two years as an active agent in demonstration and propaganda. For instance, in the case of propaganda against smut disease of *juar*, we circularised every co-operative credit society in Khandesh, asking them if they would stock a small number of packets of copper sulphate and issue these to their members, and if they were willing to arrange to summon their members together and hold a demonstration, at which an officer of my department would attend. I think only five co-operative credit societies in the whole Division replied to that circular. I think we ought to make use, and much greater use, of these co-operative credit societies, which are so numerous in Khandesh, as instruments in agricultural propaganda.

7295. How many societies are there in Khandesh?—I am afraid I cannot say offhand.

7296. Approximately, how many? Have you any idea?—I should say very nearly a thousand.

7297. Are they primary societies?—Co-operative credit societies; I am open to correction.

7298. A very important number?—Yes, quite a useful number.

7299. Only five out of the total even answered your request?—Yes.

7300. Now, do you attach most importance to the educative and, if I may so call it, moral side of co-operation, or to the provision of financial credit?—At present I attach most importance to the educative value of co-operative credit societies.

7301. On the same page, you are talking about the supply and maintenance of improved implements of tillage. You say, "Manufacturers and suppliers are not assisting, as they ought to do, in this aspect of agricultural development." What do you mean by "they ought to do"?—I think until quite recently, the Agricultural Department has been working alone in most of the districts of Khandesh in this matter. I admit that agencies of manufacturers are now being started in many parts and many towns in Khandesh; but these agencies have not been started until it has been obvious to the manufacturers from the work of the department that such business is going to pay them in the end; and I think that we might expect fuller co-operation from the manufacturers of agricultural implements, especially such as are cheap enough to appeal to the cultivators, in the actual work of propaganda in backward districts.

7302. Do you mean as a public duty, or as a venture in the interests of their shareholders?—I think if they consider both these lines, it would be to their advantage to do it.

7303. Does it not surprise you that, if there is this commercial field undeveloped and even unexplored, enterprise in India does not step into the breach and develop it?—In Khandesh at least it is doing it now, but not until the track had been blazed for them.

7304. Do you know of any difficulties in the way of Indian manufacture and distribution of agricultural implements?—There is the scattered nature of the districts over which these implements have got to be spread; there is probably the difficulty of obtaining reliable and suitable agents in

some of the backward tracts; and there is the question of finding a certain amount of capital which they will have to lay out for a considerable time.

7305. Would you proceed by direct sale or by loan?—I think the only hope is by sale on the instalment system; at least in the average tract of the district.

7306. And I see you advocate the appointment of a special *patel* whose business it would be to advertise agricultural improvements?—The reason for this proposal is that I feel that the Agricultural Department and the other departments interested in rural development are not getting down to the actual man in the village. Apart from the more educated and more wealthy cultivators our activities hitherto have not reached the people whom we wanted to reach, and I think we must have some local organisation which will continue to carry on stationary propaganda all through the year and interest the people in these activities if we are to be successful.

7307. I see that on page 446, you express the opinion that a great deal of money and energy has been wasted in the accurate recording of demonstrations on cultivators' fields and so on?—I would not go to the length of saying that money and time have been wasted; it has been valuable in educating fieldmen on the importance of results. But I think when improvements have been shown to be improvements, there is now no necessity for the accurate recording of results or weighing of produce such as is going on now.

7308. You think a certain amount of valuable data as to costing may be collected during the earlier stages of a demonstration, but that once they have been worked out, all attempts to keep accurate records should be abandoned?—I would differentiate between demonstration and experiment.

7309. On the same page, I do not feel sure that you are on such firm ground when you say, "Research work is of no value whatever to the agricultural masses of India unless the results obtained from it are brought to the notice of the cultivators and are incorporated in their general agricultural practice." Founded on that premise you say that the amounts of money spent on research work and propaganda are quite disproportionate. I follow the argument, but surely it is essential that research should keep ahead of current practice and therefore to some extent ahead of demonstration?—I agree, but I think demonstration is too far behind.

7310. It is a matter of degree?—Yes.

7311. You point out on page 447, the importance of a fuller interchange of experience and opinions between workers in various Provinces engaged on the same type of research. In your experience, is a good deal of improvement possible in that direction?—I think so. In this connection I might suggest something of the nature of crop conferences where the workers on the same crop in the different Provinces might meet and discuss important problems.

7312. Do you regard the great distances in India and the consequent high cost involved in these meetings as an important consideration?—I was especially thinking of the experiments on the cotton crop when I wrote this, in which the workers are scattered over Central India, Central Provinces, Berar, and Khandesh. The expense of holding such conferences in that case would not be very much. But I quite appreciate the difficulty that arises in the case of crops spread over the whole of India.

7313. In any case, do you not think that such conferences of research workers are of much value and workers even at considerable distances should be brought together?—I think it is necessary.

7314. I wonder what you mean actually when you link the development of the co-operative organisation throughout India with the idea of an All-India Agricultural Commission?—I was visualising the time when the development of non-credit agricultural co-operative societies, such as sales societies, marketing societies, and producers' societies will have reached an extent where the development of their further interests can be best facilitated

by an organisation which is not purely provincial. I may be looking a long way ahead.

7315. I am quite prepared to look a long way ahead, but I do not quite follow what the development of the co-operative idea has got to do one way or the other with the provincial organisation or All-India organisation of agriculture?—Take the case of manure societies. If we reach a stage when the demand for artificial manure is practically complete over all the big sugar-growing areas of India, I consider that the organisation of the supply of manure, such as calcium cyanamide and sulphate of ammonia and Chilean nitrate, from the sources from which these articles are derived will be necessary, and the supply of these manures could be done better and cheaper by an All-India organisation.

7316. An All-India co-operative organisation?—It would amount to that.

7317. You mention the investigations of a committee into the marketing of cotton. Is the report of that committee published?—The report is not published, but it is mentioned in the Minutes of the Central Cotton Committee.

7318. What exactly is the scope of that report?—The report deals with the finance of cotton cultivation in Khandesh.

7319. Including marketing?—Yes.

7320. I think it is very important that this Commission should have a copy of the report as soon as possible?—A copy was sent to the Commission, I think, early in October, of the final report of the Khandesh enquiry.

7321. Is not some enquiry going on at the moment?—We are carrying on enquiries in Gujarat, Central Provinces and Berar and Madras. These are all complete. I expect the reports of those enquiries will be submitted to the Cotton Committee in January.

7322. On page 451, you say you have submitted a list of recommendations about the manufacture of manure from night-soil. Could we have a list of those recommendations?—I can send it.*

7323. Do you know anything about the work of Mr. Fowler who is making investigations into this question?—Yes, he was working with me at Nasik.

7324. He is working privately now?—Yes, but we did work together on this problem.

7325. Where is he working now?—I do not know where he is now.

7326. Do you keep in touch with his work?—No, I have lost touch with him now.

7327. On page 452, you are talking about the need for continuous propaganda to persuade cultivators to give up the habit of burning cowdung. Have you studied the cooking habits of the villagers?—Not particularly, except that I have observed them.

7328. Has it occurred to you that there is probably something in the nature of their cooking vessels or in the practice of their cookery which requires a smouldering fuel?—Yes, I think there is.

7329. May that not be one of the principal reasons why the women object to giving up the use of cowdung fuel?—I had not thought of it before, but I think it is probably so.

7330. On page 453, you bring out in a very clear way the urgent need for getting for growers of better qualities of crop a higher price for the quality as against the volume factor?—Yes.

7331. Do these better varieties of, for instance, cotton involve a higher cost of cultivation?—The cost of cultivation is the same.

7332. He has to pay slightly more for the seed?—Yes. But the cost of cultivation is the same. When introducing a new variety we would naturally try to induce the cultivator to adopt the best methods of cultivation.

* *Vide* Appendix.

7333. If there is any reduction in the yield per acre, you have the improvement in quality?—That is so in Khandesh particularly where the poor quality cotton has the highest yielding quality.

7334. Are you familiar with the orders that have been issued in some Indian States in the Presidency, Rajpipla for instance, according to which growers are all compelled to grow approved varieties?—Yes, I am familiar with them.

7335. Do you know anything about the results of those orders?—The last report from Rajpipla pointed out that several legal cases had taken place over them, but that it was generally becoming the practice of the cultivator.

7336. Have you any information as to improved price as the result of bulking these good varieties for market?—When combined with the Cotton Transport Act they get the benefit of the good price.

7337. Is that assured now?—Yes.

7338. The Cotton Transport Act and the Cotton Ginning and Pressing Factories Act have proved very successful, have they not?—Yes, they have, especially in Bombay.

7339. On page 457, as to implements, you point out the advisability of improving the existing rather than introducing new implements, and then you talk about organising a local committee to investigate these possibilities. Would you not use some existing local body for that?—The committee I refer to, is a committee of my Divisional Board.

7340. Have you not got your Taluka Development Associations?—Yes, Khandesh is very fortunate in its Taluka Development Associations.

7341. Would they not be suitable bodies for this work? Can you not have sub-committees of those associations?—The Divisional Board I refer to contained representatives of the Taluka Development Associations; it was really a representative committee of the Taluka Development Associations.

7342. Your idea would be to have a small committee?—Yes.

7343. On page 459, you say, "Leaflets should be prepared in the vernacular on each type of improved agricultural implements, illustrating its use and giving the current prices and sources of supply of the most suitable makes. These leaflets should be distributed in the villages through the agency of the Revenue Department." How do you deal with proprietary articles in that way?—In that case we should write to proprietors for leaflets; most of them have already prepared them.

7344. But as public servants have you any instructions as to how to deal with proprietary articles?—No. I recommend what I think best.

7345. And you mentioned the proprietary articles by name?—I do.

7346. I wanted to know whether there are any particular instructions in the matter from Government?—No; I have not received any.

7347. On page 460, speaking about improving the breeds of cattle, you say, "To encourage to a much greater extent than is done at present the formation of co-operative cattle-breeding societies, by granting forest grazing areas on concession terms." Do you mean a very substantial reduction in terms?—No, we have had numerous proposals of this sort in Khandesh recently, and, as I have mentioned later, one of the essentials is that the grazing area where the breeding herd is to be kept should be segregated. That means that the cultivators who are members of the association have to undertake to fence by some means or other the area which is allotted to them for grazing purposes; I think this fact ought to weigh with the Forest Department in judging the price which is to be charged for the use of these grazing areas.

7348. Have you any personal experience of a scheme such as this?—I have.

7349. Has it proved successful?—It was held up through this very difficulty. There was a village near Dhulia where all the villagers were

willing to supply one or two cows each for a co-operative breeding scheme; they were further prepared to purchase a bull from the Agricultural Department under the premium system; they were further prepared to fence the area which was allotted to them by the Forest Department. In this case, unfortunately, the area was one which was covered with young trees, and the Forest officials of the district were afraid that these trees would be damaged by the people cutting and pulling the leaves for fodder in the dry season. When I left the district, the prospect of the formation of a society was very small on account of this fact.

7350. I suppose the difficulty was a material one from the forestry point of view?—From the forestry point of view it was, yes.

7351. They were young trees deliberately introduced?—I think it was a self-seeded area which had been cleared.

7352. Cleared and kept clear to encourage the growth?—Yes.

7353. What area known to you has the best type of cattle?—The best type of working cattle in Khandesh comes down from the Malwa plateau through the Satpura forests.

7354. Are many animals bred in Khandesh?—No, there is not much cattle-breeding in Khandesh.

7355. Do you associate enclosure with an improvement in cattle-breeding?—I think it would certainly assist the ordinary cultivator on the plains of Khandesh who was willing to take it up. As a matter of fact it would be necessary.

7356. The practical difficulties in the way of controlling breeding in existing conditions are almost insurmountable?—Almost insurmountable, and the result is that the cattle are brought down every year from Malwa and purchased by the cultivators.

7357. I do not quite understand this passage of yours on page 461, "I do not think there is much hope of increasing fodder supply by any considerable augmentation of enclosed pasture land." I should have thought that the enclosure of pasture land and grazing under a controlled system might make a substantial contribution to the fodder supply?—True; but all the land that is fit for grazing and pasture is already utilised for the cultivation of the more paying crops like cotton.

7358. You do not under-estimate the value of controlled grazing?—By no means.

7359. Do you think there would be much feeling against enclosure of part of the village common grazing grounds by groups willing to attempt improvement in the breeds?—I think it would be very unwise to attempt it except in villages where the co-operation of the people had been previously obtained.

7360. Do you think that a small minority should be in a position to defeat such schemes?—No, I do not; but I do not think the scheme would be successful unless the unanimous opinion of the people was in favour of it.

7361. The active opposition of the small minority would be very effective?—It would be sufficient to defeat the scheme.

7362. In dealing with Maketing (page 463) you give instances of extraordinary variations in maunds. Maunds are 72 seers, 50 seers, 40 seers, and so on, according to the places. Do you suggest standardisation of weights?—Yes.

7363. Do you think public opinion is ripe for such change?—I think in many parts of Khandesh it is.

7364. Do you think this complication in the unit of exchange operates against the interests of the cultivator and in favour of the buyer or the middleman?—I do not think it operates to any great extent against the cultivator, but where it operates at all it is against the interests of the cultivator.

7365. Where there are complications and difficulties, the man who is doing it all day and every day is likely to be better at it than the man who only

does it when he markets his own produce?—Yes, but I do not think this complication is an important contribution to any loss the cultivator may incur.

7366. Would you say the same thing about the system of dealing under the cloth?—Yes.

7367. You think that is definitely against the interests of the cultivators?—No, I do not think it is.

7368. I want to be quite sure about it. You do not think that the arrangement according to which commission agents buy and sell under the cloth is against the interests of the cultivator?—I do not think it is in the least, so long as there is no system of auction sale.

7369. The trouble appears to begin after the sale has been nominally completed?—Yes.

7370. That is when the cultivator begins to be milched, is it not?—Yes.

7371. Complaints are lodged and the weighments are challenged, and the cultivator having parted with his goods is more or less bound by *force majeure* to give way?—He has already emptied his cart, and rather than have the trouble of re-loading it and taking it away, in many cases he prefers to take the reduced rate. But I do not think it is altogether the fault of the dealers, because in many cases the best stuff is put on the top of the cart and the worst in the middle. But it certainly is the chief complaint of the cultivator against the present marketing system in Khandesh. I understand that in the Central Provinces there is a market law which forces any buyer complaining after weighment to re-load the cart of the cultivator if the cultivator is not willing to accept the reduced weight.

7372. What do you think of such a law here?—I think something on that line would be effective in checking the extraordinarily large reductions which are sometimes forced on cultivators in this way.

7373. The cultivator has to face not merely the labour of re-loading his cart, but also the economic cost of carting it back to his farm?—Yes, and trying to sell it each day.

7374. Are middlemen organised together?—The retailers or *dalals* are more or less organised.

7375. If the cultivator has a difference with one *dalal*, does he find it extremely difficult to sell his produce to another *dalal* next day?—Yes.

7376. What are the market charges?—They amount to about Rs. 2 per cart.

7377. Do you think that is excessive having regard to the services rendered?—I do not think it is excessive.

7378. Does that include the charity cess?—Yes.

7379. Are there any other charges?—The marketing charges are simply for stocking the goods. Then there are the *dalal's* charges, *i.e.*, broker's charges; charitable charges; and in some villages there is a charge for the national school; they mount up.

7380. Who levies the charge for a national school?—The market authorities levy it. It is levied in some of the markets in West Khandesh. It is a very small charge of one anna per cart.

7381. What is a national school?—There was a national school founded there, and this was one of the methods adopted for raising the money to run it.

7382. Did not the cultivators object to that charge?—No, the cultivators accept it.

7383. *Dr. Hyder*: Do you not think that the charges are excessive?—It is 3 or 4 annas per maund. Rs. 2 is the charge per cart.

7384. How many maunds are loaded in a cart?—About ten maunds.

7385. *The Chairman*: Is there no octroi as it would be called in France, or local tax?—No. In some of the markets, they have to pay small charges like 2 annas per cart for standing room. I think Nandurbar is a typical

market of this sort, the carts arrive overnight and in the market they pay 4 annas per cart for standing room and for water facilities.

7386. The produce is always sold off the producer's cart, is it not?—Yes.

7387. Not in a godown?—No.

7388. Are there any storage facilities?—No, there are no storage facilities.

7389. *Sir Henry Lawrence*: Are there any octroi charges for goods coming into the market?—No, I do not know of any charges being put on carts coming into a market for that reason.

7390. *The Chairman*: Do you think a case exists for investigation into, and analysis of, the price structure of produce grown and consumed in India and again of produce grown in India and exported?—Do you think it is important that the price structure of these goods should be recorded and analysed?—I think it would be valuable in the case of articles which form a considerable portion of export.

7391. But not of articles consumed in India?—I do not think in the case of *jowar* and most food crops it would be very valuable.

7392. Do you think the cultivator gets a better share of the world's price in the case of produce exported than he gets of the retail price of produce grown and sold in India?—I think he does. In the case of exported articles like cotton the price is connected with factors outside India altogether.

7393. And large and important buyers are at work in all the districts and their activities have a great effect on the local price, have they not?—In Khandesh the chief factor affecting the price given to the cultivator is the price in Bombay for lint on the preceding day.

7394. Is it not the case in the matter of produce consumed in India, that it is handled as a rule by smaller buyers than is the case with exported produce?—Yes; it is.

7395. Do you not think the cultivator is more likely to get a lower price than that which the retail price justifies in the case of produce consumed in India, than in the case of produce consumed overseas?—I really do not feel qualified to answer that question; I have not studied it.

7396. In the case, for instance, of a cultivator who is in debt, and who is bound to hand over his produce to the lender, is it not easier for the lender to discount an unfairly small amount of the loan in the case of a produce to be consumed locally than it would be for instance in the case of cotton where the price is known?—Yes; it would be.

7397. Do you not think a careful investigation of the marketing of all produce consumed in India might be illuminating?—I certainly think so; I think investigation of the marketing of all produce would be very valuable.

7398. Is much known at the moment as to the details and finance of marketing in India?—I do not think there is nearly enough.

7399. It is no use going on mere prejudice and hearsay in these matters?—No, hearsay is a very bad guide in this case.

7400. On page 466, in connection with the management of co-operative societies you say, "Each shareholder is entitled to five votes in virtue of each share in the society, which he holds." Is it the custom in India for societies to attach the vote to the share and not to the member?—I am afraid I cannot answer that. It is just a scheme I have submitted as a means of financing distributive co-operative societies.

7401. I wondered whether you thought it was in tune with the spirit of co-operation to attach the vote to the share and not to the member?—I want to attract as large a sum as possible to these societies.

7402. *Sir James MacKenna*: You are in favour of a central organisation for the development of agricultural research, and in your opinion the Central Cotton Committee has reached the high water mark of such centralised direction of a particular crop?—I think it is the best example in India.

7403. Am I right in thinking that was the direct result of the Indian Cotton Committee of 1917?—It was.

7404. Do you think that without an equally intensive inquiry into other crops, such as rice and wheat, we could build up an equally effective organisation?—I think an investigation of the same nature as that made by the Indian Cotton Committee would be extremely valuable, but experience of the working of the Indian Central Cotton Committee would do away with a certain amount of the investigation necessary in the case of other crops.

7405. Have you thought out in any detail how the central organisation would function or be composed?—I have thought a good deal about it, and I would suggest that the central organisation should be composed on very much the same lines as the Imperial Department of Agriculture in India, with the exception that it would not be centred at one large research station tucked away in the corner of a Province and not available for people to see. It should control throughout the Provinces small research stations, preferably situated according to crop requirement; and in addition it should co-operate very closely with the Provincial Research Committees. Under your main big committee you would have smaller provincial committees working on particular crops and particular items of research necessary for that Province.

7406. The big advisory central committee would necessarily work largely through sub-committees?—Yes, in the Provinces, which would have representatives on the central committee.

7407. Would you have trade representation as well?—Most decidedly; in every case possible.

7408. In all cases where the crop was commercial?—Yes.

7409. Have you any views about financing such a central body? It would require money, of course?—Yes.

7410. Have you thought of that aspect of it at all?—I have not, really. I only think it should be provided with the maximum amount of money possible.

7411. Wherever it comes from?—Yes.

7412. You have no suggestions to put forward on that? It is not quite as easy as the cotton proposition, where there was an organised trade willing to tax itself?—That is quite true.

7413. *Professor Gangulee:* Are you satisfied that the success hitherto achieved by the Central Cotton Committee justifies the adoption of similar methods of work in regard to important food crops?—I think so. I think the success of the Central Cotton Committee is the most outstanding feature in the agriculture of India in recent years.

7414. I follow that. But is there sufficient trade interest in Indian food crops to mobilise resources in the manner possible in the case of cotton?—No; I think that would be a difficulty in building up a similar organisation, but in the case of food crops mostly consumed in India the finance of any such organisation will have to come from some other source than trade.

7415. Am I right in thinking that the basic work of the Central Cotton Committee is in the field of research, and not in the field of propaganda?—The Indian Central Cotton Committee decided, at their initial meeting, that they would not touch subjects dealing with propaganda to begin with, but would confine their attention to research into the improvement of the Indian Cotton Crop. But I do not think that precludes them from adopting propaganda work, when they found it might be in the interests of the Indian cotton-growers to do so.

7416. Hitherto, you have not directed your attention to any propaganda work?—Only in a very small way, such as sending exhibits to the Poona Agricultural Show, and little things of that nature.

7417. Here you make a reference to it, and in answer to the Chairman you have already explained that you attach a great deal of importance to propaganda work?—I do.

7418. And you consider that amounts spent on research and on propaganda are disproportionate?—I think so.

7419. In the event of having an organisation like that of the Central Cotton Committee, you would not have it devoted solely to research work? Research is a fundamental pre-requisite to propaganda? Do you agree to that?—I do.

7420. Research, in the case of the Central Cotton Committee, is its basic motive?—At present it is, but I do not agree that it will always remain that.

7421. Gradually it will undertake some sort of propaganda work?—I think the propaganda side will develop, but at present there are so many urgent problems awaiting solution that the Central Cotton Committee decided it was more profitable to confine their attention to research to begin with.

7422. How do you organise your research work? When you have to formulate a definite programme, how do you proceed?—Definite programmes are submitted to us by the Provincial Governments. The Indian Central Cotton Committee consider them, first of all in an agricultural research sub-committee and finally at a full meeting of the Committee. They are discussed from every aspect, agriculture, trade, etc., and if they are considered of sufficient importance, the Central Cotton Committee allot a special grant to that Provincial Government, to be administered through the executive of that Government, in this definite line of work. That grant is granted for a special term of years, and every year the reports on that work are considered by the Committee, and at any time the Committee can stop it, or have the power of extending it.

7423. In this way, are you able to eliminate the possibilities of overlapping of research work?—I am not very frightened of overlapping in research work. We have two schemes at present, of which one is going on in Dharwar and the other in the Central Provinces, on the same problem, and we are much more likely to arrive at a solution as a result of both investigations than we would have been by one.

7424. By this Cotton Committee, you have been developing a sort of spirit of team work among the investigators?—I think we have.

7425. That is, a group of workers tackling one fundamental problem?—Yes.

7426. Can you cite an instance of an item of research that you have been able to undertake since the existence of the Indian Central Cotton Committee, to which inadequate attention was given by the Provinces?—Yes. We have got the subject of the boll worm, which is a problem, which affects not only the United Provinces, but also Gujarat and Khandesh, and creeps into the Central Provinces and Berar.

7427. The shedding of the boll worm?—The effect of the boll worm in the shedding of the bolls and the resultant loss in cotton. This problem could not have been undertaken properly except by an All-India organisation of the type of the Indian Central Cotton Committee.

7428. Take the case of the work begun by Dr. Leake. Am I right in thinking that this fundamental research work that he started would never have received much attention from the Economic Botanist of that particular Province, had it not been for the Indian Central Cotton Committee?—I think that the way to look at this is that the research worker in a Province is bound to direct his attention to those problems which appear to be most pressing for that Province for the time being, and he may have to alter occasionally. But when you have an organisation like the Central Cotton Committee, which is independent and provided with funds of its own, it can undertake a definite problem and get results, and the only justification of all research work is getting results.

7429. You have undertaken some fundamental researches on cotton?—We have.

7430. During the period of your service as Deputy Director of Agriculture were you obliged to give up any line of research on account of fluctuations of provincial budget grants?—As Deputy Director of Agriculture, I was never able to take up any research. My time was occupied with propaganda and

work in the districts, and I had practically no facilities for going in for research work at all.

7431. Would you have liked to have those facilities?—I enjoyed my work in the districts, but I should have liked to have a laboratory on one of my farms, where I could have undertaken little pieces of research work which seemed to me to be of importance in the districts.

7432. From the general trend of your memorandum, I gather that you consider that the time has come for the Indian Agricultural Department to devote more attention to propaganda than to research?—As a district officer, I feel more propaganda is necessary to put the results which research has brought to notice into practice.

7433. And you say you are handicapped by insufficient demonstrators?—We are handicapped for want of staff and money.

7434. There, do you agree that in order to have fieldmen and demonstrators, the next step of development must be in the direction of agricultural education?—Yes, we certainly need that.

7435. Therefore you would lay a great deal of emphasis on agricultural education schemes?—Of that type which will produce the men required, yes.

7436. You make a very interesting statement about non-official gentlemen taking a great deal of interest in the spreading of improved methods. Do you mean large landowners?—Some of them are landowners, but others are not.

7437. In the event of holding any demonstration, would they co-operate with their tenants?—They do.

7438. Is it your experience that the example of large farmers has in any way influenced the smaller farmers in the introduction of better methods of farming?—I am afraid I cannot say it has.

7439. It does not percolate down to the small man?—If it does so, it is a very slow process.

7440. Could you suggest any method of accelerating that process?—The only method of accelerating that process would be, as I have mentioned in my note, by making available the sources of supply of the material which are necessary for introducing these improvements at a cheap rate, and making these sources easily available to the small cultivator. The big cultivator can go himself and get these things and pay for them; but the smaller cultivator cannot, and they must be put down at his door if we are going to have any general rise in the standard of agriculture.

7441. On page 438, you make the suggestion that you would like to have a committee which would administer a special permanent research fund, but though throughout the memorandum you have emphasised the importance of propaganda, you have not made any suggestions for a fund for propaganda purposes?—I do not consider that money is so essential to propaganda work. What we want is to interest the people and get non-official co-operation. Any success we have had in Khandesh has been entirely due to that. But, at the same time, I think that the money we do get for propaganda work is insufficient. Demonstrations cost money. We have to cart ploughs about the country and to make arrangements for demonstrations in villages, and that needs money.

7442. For propaganda work you would depend on non-official agencies?—I think it is absolutely essential. We must have the co-operation of non-official agencies in all the villages if propaganda is going to be extended as it ought to be.

7443. In order to get them sufficiently interested, the State will have to take the initiative in this direction?—It is doing so now. We are subsidising associations.

7444. Are you of opinion that there are already agencies in rural areas, through which propaganda could be effected?—Every good cultivator is an influence.

7445. I am referring to organisations like the Taluka Development Associations?—Yes. We have good experience of these in Khandesh, and they have proved most valuable, especially in the direction of propaganda work.

7446. Would you call Taluka Development Associations voluntary organisations?—Yes, entirely.

7447. They were not organised by any impetus from the official side; they organised themselves?—They came entirely from within, and in that lies their special value.

7448. They are subsidised by the Government?—Yes, and I criticise that.

7449. The initiative came from themselves?—Entirely.

7450. Their growth is organic?—The growth is from within, and not due to any external pressure from officials.

7451. Do you hope to see these organisations as local nuclei for rural betterment?—I hope so. In Khandesh, my experience has been that the need is not to assist in the formation of these organisations, but to stop them from forming too quickly.

7452. Who are the organisers?—In most cases, they are men who are interested in agriculture themselves, often town dwellers, and are generally men of some public note.

7453. By training, they have had some agricultural education?—Most of them are farmers themselves. We have found that generally these organisations, as one would expect, arise in the taluka town.

7454. What was the motive behind their organisation? Were they purely co-operative organisations for the spread of agricultural knowledge?—I could see no motive, except to try to improve the agriculture of their district.

7455. Were they formed from any religious, social or political bias?—No. There was nothing of that.

7456. Do they correspond to the County Agents in the United States or the *Konsulents* in Denmark?—They are in the same category as the agricultural associations of Denmark.

7457. I am referring to the organisers?—The *Konsulents* in Denmark are generally men who are experts in agriculture.

7458. And so are the County Agents in the United States of America?—Yes, in these cases, the organisers of these Taluka Development Associations are, as I have stated, people who take an interest in the agriculture of the taluka, and generally men who are high up in the public life of the district.

7459. You have stated that you do not approve of State help (Rs. 1,000 a year, I understand it is) for the Taluka Development Association. Do I understand you aright?—Yes.

7460. You think the State should not give any aid at all?—No, I think the State should give its aid in the way of giving them an experienced graduate and paying him and letting him organise the collection of subscriptions and the local funds within the associations. I do not think it is in the interests of these associations to give them any pecuniary help.

7461. In addition to the number of village officials already in existence, you have made a suggestion with regard to the creation of a new official called the *Agricultural Patel*. What would be his status? Under whom would he work?—This is merely an attempt to bring agricultural improvements in closer contact with the actual villagers.

7462. Would he be a village official?—He would be no more an official than the ordinary *mulki* and police *patel* in the village; probably less so.

7463. Would he be under the Revenue Department?—No, under the Agricultural Department. It matters not which department he is under, as a matter of fact.

7464. Are the Revenue officers popular among the villagers?—In Khandesh the Revenue Department and the Agricultural Department have always co-operated extremely closely, and I have had nothing but very valuable help

from the officials of the Revenue Department all over the district ever since I went there.

7465. On page 441, you suggest that the teachers in rural areas should be drawn from the agricultural classes. What sort of education would you consider suitable for these teachers?—I am afraid I am not an authority on agricultural education. I merely think that if a teacher is going to work in an agricultural bias school, and teach the sons of agriculturists, he must know their mode of life, and he must not come from a town. He must be able to appreciate the point of view of an agricultural boy.

7466. Do you agree with me that agricultural education, in order to be effective, must rest on a basis of broad general education?—To a certain extent I do, but not entirely.

7467. On page 442, you make a very interesting suggestion. You say, "I would also suggest that students at the Poona Agricultural College who take general farming or farm economics as their special subject should be obliged to spend a definite period of time on a Government farm in the district before being allowed to appear for their final examination." Did you place that suggestion before the authorities?—I did when I was asked to submit my suggestions for the extension of the Poona Agricultural College. That was one of my suggestions.

7468. It has not been carried out?—Not as far as I know.

7469. From your personal knowledge of the co-operative movement, can you tell us if this movement is yet a living force in the rural areas where it exists?—I can only speak for Khandesh, and in many parts of Khandesh I think I would be speaking the truth if I stated that the co-operative activities of the societies in that district are the only force which is operating towards agricultural improvement, the only real non-official force, in any case.

7470. As far as Khandesh is concerned this movement has gained a dynamic character?—Yes, it has.

7471. You make a suggestion that the distribution of seed should be in the hands of a non-official agency. With the development of plant-breeding work in this country, do you agree that it is essential to have a satisfactory organisation for the distribution of seed?—Once it has been decided that the results of the plant-breeder's efforts are fit to be put in the districts, then the organisation of an adequate distribution of seed is essential.

7472. Would you entrust the co-operative or non-official agencies with this fundamental work?—I would.

7473. Would you exercise any control over them?—I would not exercise any control, but co-operate.

7474. Would you not exercise control over the purity of the seed and the germination tests?—The initial supply of seed has got to come from official sources, say, the Government farms, but I think after the seed has been produced on the farm, the function of Government and the officers of the Agricultural Department is merely to assist non-official bodies such as co-operative societies in their methods of distribution.

7475. I agree, but do you realise that the economic loss on account of bad germination is tremendous in this as in other countries, and that the only check is to have official control over the seed trade? In Denmark, although the whole trade originated from non-official agencies, the famine in 1893 made it necessary for the Danish Government to take charge of the seed trade, and have State seed-testing stations. In England a seed-testing station has recently been opened. Are you suggesting any such seed-testing stations?—I do not think that will be necessary for a long time to come yet.

7476. *Mr. Calvert:* You suggest a small wheat research station in the Tapti Valley area. Would the problems in wheat there be different from the problems now being studied at Pusa, in the United Provinces, or in the Punjab?—Yes, because I understand in the Punjab it is mostly an irrigated crop in the Tapti valley it is a dry crop. I do not know much about wheat in the Punjab. I have never been there.

7477. There are about four million acres dry?—This is practically entirely a dry crop, and the nature of the soil which is a deep black soil verging down to river silt, is of such a kind that it seems to be specially fitted for research on the spot.

7478. Do you really think that there are problems of almost purely local importance so great as to justify a research station?—Yes.

7479. Apart from the general work on the same crop in other Provinces?—I think so.

7480. Then you say that there are very few facilities for the training of men of the Mukadam type in specialised forms of agriculture. Have you tried special classes on your farms at all?—We have had foremen on the farm and endeavoured to give them the training they would require for special posts. But I think that is not enough. I think we ought to make more use of our agricultural stations for training this type of men.

7481. May I take it that what you advocate is beyond the present power of the Deputy Directors to carry out?—Absolutely beyond their powers.

7482. More staff would be required?—I have no facilities for training men in tractor-driving or well-boring in Khandesh.

7483. In fruit cultivation and repairs of implements?—I could give training in fruit cultivation with non-official assistance, because I am fortunate enough in having a very fine fruit grower who is willing to undertake the duty.

7484. Do you want a separate centre of activity in your own Division?—I should not confine it to my Division. I would like to be able to send men from my own division to a place where such training could be got.

7485. With expansion of activity, it practically comes to having a centre of training under each Deputy Director?—I do not think so. I might have no centre in Khandesh; I may have to send all the men I want trained to other parts of the Bombay Presidency.

7486. On the question of propaganda, have you tried concentrating propaganda within a few villages and trying to convert the whole of the cultivators of those few villages, rather than dispersing propaganda over all the villages?—We have gone further than that, and concentrated propaganda in one village in my district of Nasik.

7487. Did you find good results?—Since at the time I left we had been doing it only a year, I think the results of the attempts which we made were very good indeed. We disposed of nearly 170 ploughs in the village and round about it.

7488. What was the link binding your concentration? The co-operative society?—Yes.

7489. Was there a better-farming society?—No.

7490. In your entire district, have you any specific societies for promoting better-farming?—No.

7491. If you had such organisations, as we have in the Punjab, would you give them preference over the unorganised public?—I would. I would do everything which would encourage them.

7492. Japan practically forces people into the co-operative guilds by refusing help to anyone unless he belongs to them. Would you be prepared to go as far as that?—Yes; I think in many cases the end would justify the means.

7493. It is merely a question of using your present staff to the full capacity?—It is.

7494. Would you favour co-operative organisation for better farming by giving them preference over individuals?—I would.

7495. In discussing crops and manures you talk of "an additional profit per acre." Do you mean by that net profit?—Yes.

7496. It is page 453 where you are discussing cotton and saying there will be an additional profit of Rs. 7 per acre?—Yes, profit.

7497. We have been told that these new types of seed require better cultivation and more manures than the other types. Is that your experience?—No.

7498. That to get the best results from your improved seeds you must have better cultivation?—That is quite true, but to get the best results from the old seed also you must have better methods of cultivation. It is not a special point in connection with the improved varieties.

7499. I was trying to find out how much of your extra profit is due to better cultivation and how much to better seed?—This Rs. 7 is the additional profit per acre with the improved N. R. seed grown on the cultivator's fields in the same way as they grew the old seed. It is due to higher ginning percentage and better yield.

7500. Under Animal Husbandry, you seem to consider that the formation of co-operative cattle-breeding societies depends on getting some concession from the Forest Department. Are there any existing obstacles to organised co-operative cattle-breeding?—The great difficulty is the question of a grazing area in my district; that is why I have laid such stress on concessions from the forest authorities because I consider it to be so important that these societies should be given facilities for segregated grazing. We cannot hope for success attending such societies unless the forest authorities are prepared to co-operate.

7501. If you can get a whole village to join the co-operative organisation, using their existing grazing ground, would not that meet the difficulty?—The trouble is that all the cattle of that village every dry weather go to the forest and mix with cattle from other villages.

7502. And you think they are exposed to disease?—Yes, and to indiscriminate breeding.

7503. It is difficult to improve the breed of cattle unless you secure immunity from disease and risk of breeding with the bad bulls?—Yes.

7504. Would you advocate steps being taken to prevent breeding with the bad bulls?—Yes.

7505. Do you advocate castration?—We do advocate castration.

7506. Do you find that the opposition to castration is dying out now?—I do not think it is strong in Khandesh.

7507. On page 461, you talk about fodder crops on a system of intensive cultivation giving higher yields. Is the obtaining of the highest yield the important part of it or the highest net profit?—In this case all the fodder raised will be given to the cattle of the grower so that yield is really what we should aim at. If the cultivator has got, say, 2½ acres as a whole, I would have him set aside a few *gunthas* of that area for the cultivation of some high yielding fodder under intensive cultivation and heavy manuring in order to get as high a yield of fodder as possible for his cattle.

7508. Such yield must be limited by the question of profit?—Yes, that is so. But what I was thinking of, when I wrote this, was a man growing his own fodder for his own cattle. He should get as much fodder as he can out of a small area.

7509. But eventually it is a question of profit. He can purchase his fodder if he can get it cheaper?—Yes.

7510. You can sometimes purchase your highest yields too expensively?—Undoubtedly.

7511. Coming to marketing, I gather you have no experience of co-operative marketing on a commission basis?—No. The only thing approaching that is the co-operative sale society at Pachora, which does nothing more than realise fair weighments and payments on the same day to its members. The members sell most of their *kapas* outside; it only deals with about 4,000 carts a year.

7512. I gather that society does not incur the hostility of the *dalals*, for at the end of your section on marketing you say, "The society should avoid

incurring the hostility of *dalals*''?—The *dalals* are mostly members of the society, but very few cultivators bring their carts there. The only people doing so are petty merchants who have bought cotton in the villages. 99 out of every 100 carts belong to them.

7513. Not actual producers?—Not actual cultivators, no; they bring cotton bought in the villages and brought to Pachora, where it is sold to the gin owners.

7514. You stress the fact that the society should avoid incurring the hostility of *dalals*. Why cannot the society be its own *dalal*?—If these societies are to be successful in Khandesh they will have to interfere as little as possible with existing conditions. If they can utilise more reliable and better *dalals* they have a very much better chance of establishing themselves.

7515. You would rather work with the present system than fight it?—I would.

7516. You say that officers of the Co-operative Department require some knowledge of agriculture. Do these officers regularly visit your farms and go through them once or twice a year?—Yes. We often have visits from officers of the Co-operative Department in Khandesh; they take a great interest in the work of agriculture.

7517. Is there any systematic attempt to keep them abreast of your developments?—There is no course of training or anything of that sort.

7518. Is there no short course for them in agriculture?—No.

7519. Would it be difficult to organise such short courses?—I do not imagine so, and I think it would be very desirable to have a short course in co-operation for agricultural officers and a short course in agriculture for co-operative officers.

7520. In the Punjab the superior staff have to go through one month's course in the Agricultural College, and others take a six months' turn in practical agriculture?—I do not think the agricultural college would be any use for this. I think any course ought to take place on the Government farm of the district where they work.

7521. The college course is in rural economy?—I am referring to a course in practical agriculture and the methods of the district.

7522. You think that could be arranged?—Yes, I think so.

7523. I am not quite certain about your attitude towards Government taking an active part in organisation. At page 464 you say Government should not take any active part in the organisation of co-operative societies, but on page 465 you speak of the necessity for official organisation?—On page 465 I do not refer to the organisation of the society. The organisation of the society has got to come from the people themselves. But after the society has been formed, the organisation of their management and the way they do their work must have official, expert help in the initial stages at least.

7524. Do you not think that the organisation is more important than the origin of the organisation? What we want is the organisation; never mind the source?—Are you speaking of particular societies or generally?

7525. I am speaking of organisation of the people generally for agricultural co-operation. The main thing is that we should have agricultural co-operation?—I do not think so. I have found in the Nasik district that the failure of many societies of this nature that were organised officially has caused a great set-back to the co-operative movement in that district. It would have been very much better if such societies had never been organised and had never come into existence.

7526. Do you know that in Japan agricultural organisation is entirely a State affair?—Yes.

7527. Japan has started her co-operative movement from above?—I do not know the conditions in Japan.

7528. You stressed, I think in answer to the Chairman, the educational value of co-operation. If the education comes from the official agency, will you have any objection?—No.

7529. Dealing with your scheme to give votes by shares, as to which the Chairman asked you some questions, are you not stressing the non-co-operative element by that?—My whole idea was to obtain as much capital as possible to give these societies a start off.

7530. You have no objection to its being a purely co-operative organisation?—None at all.

7531. You have given us an interesting note on Denmark.* But do you think the example of Denmark is a suitable one to hold up to India? There are certain differences. Is not Denmark dealing mainly with animal products? It is mostly that and dairying, which you do not get in India?—Yes, that is true.

7532. And there you have mostly cultivating ownership, whereas half Bombay is cultivated by tenants?—Yes.

7533. Do you know whether tenants enter co-operative societies in your division?—Judging by the inquiry we held, I think they do, because a large number of tenants we inquired of had borrowed from co-operative societies, and so must have been members. I think there is no doubt that they do join co-operative societies.

7534. And then Denmark has no large towns dominating its rural areas; it is entirely a rural country?—It is.

7535. Denmark has also had the good sense to imitate Scotland in its agriculture. Also it is a free-trade country?—Yes.

7536. So it is not quite fair to hold up Denmark as an example for India to follow?—I would not go to the length of comparing them, but the principles underlying the practice are the same.

7537. The difficulties are different?—Yes.

7538. Are the persons whom you mention as taking interest in agriculture, cultivating owners or rent receivers?—In most cases they are cultivating owners.

7539. Does the pure rent receiver take much interest?—None, except in the political field.

7540. *Mr. Kamat*: On page 438 you advocate that Bombay should have a Provincial Research Committee and also a special permanent Research Fund. Should this fund be a provincial fund or an All-India fund?—This refers entirely to the Province; it will be a provincial fund.

7541. You prefer to have a provincial fund?—Yes, in this case.

7542. Do you wish to give any opinion on the question whether this fund should be raised from the general tax-payer or from a particular trade; for instance, funds for cotton research will be raised from the cotton trade and for oil-seed research from the oil-seed trade?—I do not really mind where the money comes from as long as it is obtained. What I have advocated here, however, is purely a provincial organisation, and I do not think you can organise trade money on a provincial basis; it must be on an All-India basis. If only the cotton mills of Bombay had to pay a cess of 2 annas a bale, they would be placed at a disadvantage compared with mills in other parts of India. So any trade cess must, I think, be on an All-India basis.

7543. The pupils in the Dhulia Agricultural School get free boarding and free lodging?—Yes.

7544. But part of the money is raised by a local committee of non-official gentry?—Yes.

* *Co-operation in Denmark*.—Reprint of Report to the Government of Bombay, published in the *Bombay Co-operative Quarterly*, September and December, 1925.

7545. The school came into existence because it was financed by non-official gentlemen or members of the Agricultural Association?—Yes.

7546. But you are finding it difficult to get boys for the school and the headmaster has to go round the Division and induce the cultivators to send their boys?—Yes.

7547. So that the people who pressed for this school did not really reflect the mind of the cultivators?—I am afraid they did not.

7548. And therefore, would you be rather cautious in pressing such experimental schools in other parts of the Division?—I would be very cautious.

7549. For the purpose of propaganda you are advocating a scheme of *shetki patels* in each village?—In each of the larger villages.

7550. I presume you expect them to be conversant with agricultural practice, that is to say, they should be trained men, if possible?—Good cultivators.

7551. Ordinary cultivators?—Yes.

7552. Do you think that ordinary cultivators if invested with powers as *shetki patels* will be able to carry on propaganda work efficiently?—They can certainly assist propaganda agencies in their village.

7553. Do you think such work cannot be done by the ordinary revenue *patel*?—If the revenue *patel* would do it, it would be quite a good solution.

7554. Otherwise, your idea is not to have *shetki patels* on an honorary basis but to give them some small remuneration from Government funds?—Yes, but on the whole I should be chary of using the revenue *patels*. I do not want to make the villagers think that there is any compulsion about the introduction of agricultural improvement, and they might associate that with the use of the revenue *patel* as a propaganda agent.

7555. You want a separate institution?—Yes.

7556. Divorced from the revenue *patel*?—Yes.

7557. And which would mean the provision of funds?—Yes, at least to a certain extent.

7558. You say on page 464 you are averse to Government taking an active part in the organisation of co-operative societies. I presume you are also averse on principle to the idea of subsidies from Government to such bodies as Taluka Development Associations?—Subsidies in money, yes.

7559. Both with reference to co-operative societies and Taluka Development Associations, leaving aside, perhaps, the special case of Khandesh, do you think in the whole of the Presidency either the one or the other would have come into being without any active help from Government?—I do not think they would have come into being without the educative force which Government can supply or assist in supplying, but I do not want to be misunderstood. What I object to is a Government officer of any department whatsoever going to a village, calling a meeting of the cultivators, and saying, "Let us have a co-operative society here," and getting that meeting to nominate officials and having the society registered by the Registrar of Co-operative Societies as a co-operative society. In such cases I consider failure is almost inevitable. A great deal of educational and propaganda work should have been done in that village first, so that the people themselves would realise the advantages of having a co-operative society and instead of having it forced on them would have come and demanded it.

7560. Do you not think that goes at the very root of the idea of having a Co-operative Department?—No, I do not think so in the least. There is plenty of work for them to do apart from this.

7561. How many Taluka Development Associations are there in the whole of the Presidency?—In Khandesh there were 11 out of 33 talukas which had them, but I believe there are now 13 or 14.

7562. So that even in the best and most prosperous of our districts, Khandesh, you have not yet got a Taluka Development Association for each taluka?—No.

7563. Yet you think Government should not take any active part or subsidise these associations?—As far as Khandesh is concerned, there would have been no difficulty whatever in having a Taluka Development Association for each taluka while I was there, but we only recommended for registration such associations as we thought were likely to be successful. We have had applications from practically all except the most backward talukas in the division for the formation of Taluka Development Associations; they have even come from talukas where no propaganda work has been done at all.

7564. How do you reconcile the fact that you are not in favour of a Government subsidy for these associations with your view as to the desirability of appointing a special *patel* in the villages, to be paid out of Government funds?—What I recommend is that Government should provide these associations with a graduate rather than a sum of money. This money was originally given for the association to provide itself with a trained man to guide its activities and help the organisers. I think it would have been very much better if Government had given the man instead of the money, because now when these associations find themselves in difficulties they apply to Government to increase the subsidy; whereas if from the beginning they had been given the staff and the means to introduce agricultural improvements in a form other than money they would be very much more independent and likely to rely on their own resources. At least, that is my opinion.

7565. Do they not press for more money because the problems for solution are increasing?—Yes, that is the reason, but what I mean is that they would devote more attention to the collection of money within their own limits if they did not think they could get their subsidy from Government increased.

7566. In Khandesh you are having an increase in the area under new crops like ground-nut?—Yes.

7567. And also, perhaps, improved cotton?—Yes.

7568. Is that displacing food crops?—Ground-nuts are displacing *bajri* considerably.

7569. Do you think the evil is growing to such an extent that you will have to import food grains?—No, I do not think so.

7570. *Dewan Bahadur Malji*: How many years were you Deputy Director?—From August 1921 until May of this year, when I left Khandesh and came to Bombay.

7571. Can you talk Marathi?—I can.

7572. So you have had opportunities of mixing with the agriculturists in the interior?—I have spent half my time in the interior.

7573. The agricultural bias schools are certainly a need of the day?—Yes, I think they are.

7574. Do I take it that all such schools are provided with plots to work on?—All the bias schools are, and many of the other primary schools also.

7575. And the students are made to take an interest in these plots?—They are made to do a certain amount of work on them. I am not prepared to say that all the plots are what they should be or are filling the place they ought to fill.

7576. There is still great scope for improvement?—I think so.

7577. With regard to practical lessons given after graduation to students of the agricultural college in farm management and marketing, you have said something about that in your note?—My only experience of any post-graduate training is with the course we endeavoured to form at Jalgaon farm on farm management. It is a big farm of 204 acres. Sir Chunilal Mehta, when Minister for Agriculture, suggested this farm might be utilised to train the graduates of Poona College in farm management and economics, but, as I have said in my note, it was not a success.

7578. Can you make this an attractive thing? If you can, it is very important?—Very important. I have suggested ways of making this course more attractive.

7579. By means of scholarships?—I think some form of allowance should be paid to the students.

7580. Is it your experience that the Taluka Development Associations are very useful and are making progress in Khandesh?—I think they are one of the most useful agencies in agricultural improvement.

7581. Are they doing anything in connection with co-operative purchase and sale?—Yes.

7582. May I know the names of the associations doing that work?—The Pachora, Jalgaon and Nasik Taluka Development Associations purchase manure and fertilisers wholesale, and implements and so on.

7583. They are not dealing in agricultural products yet?—No.

7584. Do you look forward to the day when they will do that?—I do not altogether agree with that. I think that requires a different type of organisation altogether; a more specialised type.

7585. *The Chairman*: You are in favour of the single purpose society?—Yes; I am not in favour of Taluka Development Associations doing this work.

7586. *Dewan Bahadur Malji*: Where there are no seed supplying associations, would you like the Taluka Development Associations to do the work?—They do it; they are the main source of supply.

7587. The Supervising Unions could act as a very reliable agency for the supply of pure seed? Wherever Development Associations do not exist and there are Supervising Unions or District Banks do you not think they could act as agents for the supply of pure seeds?—Yes; they are doing it in Khandesh, where the District Banks are very valuable agents in seed distribution.

7588. On page 455 of your memorandum you suggest honorary organisers for co-operative and agricultural work. Have you tried this experiment in Khandesh?—We have honorary organisers of co-operative societies there.

7589. Have they been tried anywhere for propaganda in regard to agriculture?—All the members of the committee of a Taluka Development Association are really honorary agricultural organisers, because many of these organisations send their members into the villages.

7590. You think the Agricultural and Co-operative Departments can work hand in hand in these matters?—They must certainly do so if any progress is to be made.

7591. As regards the grass contracts in the forest area, do you think Development Associations such as exist in Khandesh can be utilised very much in that direction?—I do not think it is outside the scope of the activities of Taluka Development Associations to take co-operative grazing in the forests.

7592. As you say there is a large margin for contractors, cannot you bring home these advantages to the co-operative societies?—We are trying to do that.

7593. Are you in favour of the standardisation of weights and measures?—I am.

7594. With reference to the visits of rural leaders from places such as Hadapsar to different parts of the country, carrying knowledge into the areas which they visit, do you not think this sort of propaganda can be advantageously carried out by the department?—Yes, but I think the value of such propaganda would lie in its non-official nature, if we could have people who have actually experienced the advantage and personal profit resulting from good co-operation.

7595. Perhaps you would look to the Institute for propaganda?—I would look to some organisation such as the Bombay Central Co-operative Institute.

7596. *Sir Henry Lawrence*: Your work has been confined to Khandesh and the Nasik districts, has it not?—Yes.

7597. Can you tell me the expenditure of the budget for your particular branch in those districts?—Roughly about Rs. 40,000.

7593. On what scale would you wish to see it developed; what do you think should be the expenditure for the additional officers that you desire for propaganda work? Would you want it two or three times as big?—I could utilise twice that amount easily under present conditions in putting officers where they are urgently required.

7599. That would cover the whole of the propaganda work in present circumstances?—Yes, I think so.

7600. You spoke of cultivators doing research work, as I understand; what type of cultivators are these; are they the village *patels* or men of a higher status?—They are landowners who cultivate their own lands, mostly proprietary cultivators.

7601. Men with a college and English education?—Most of them have; the ones I am thinking of have, but it is not essential.

7602. Are any of them *Inamdars*?—A few, yes.

7603. They take an interest in the cultivation of their estates and desire to spread agricultural improvements?—They do.

7604. Have you been in other parts of Bombay; do you find that same type of man elsewhere?—I have not been sufficiently long in any other part of the Presidency to find that out.

7605. Have you been to Dharwar?—I have been to Dharwar, but only for a very short time.

7606. Have you been to Poona?—I was in Poona for a few months.

7607. You cannot say whether the intelligent Khandesh cultivator is to be found elsewhere?—I think you find more of them in Khandesh than any other part of the Presidency.

7608. You spoke well of the Dhulia Agricultural School; is that of the type which is known as the Loni school?—It is of the same nature as the Loni school, yes; the boys live in the school.

7609. And the course of farming is identical, is it?—Exactly the same, yes.

7610. You found that to be of value, and you wish to see the members of that school increase, do you?—Not unless there is an expressed demand for them.

7611. You think the one school in Dhulia will be sufficient for your purpose in the Khandesh district?—It is at present, because we have some difficulty in filling it; that is why I think it would be inadvisable to start other schools until we find there is an assured demand for them.

7612. Are all these cultivators who are willing to accept improvements, of the *Kunbi* type?—Yes, mostly.

7613. Do you find any such men amongst the Bhils or the Mahars?—Very seldom; it is very unusual to find the Bhils taking to improved agriculture.

7614. You have a large population of Bhils?—We have.

7615. What is the proportion? Is it 25 per cent.?—In West Khandesh I should think at least 25 per cent.

7616. What is the proportion of *Mahars* in East Khandesh?—I am afraid I cannot say.

7617. But there are very large numbers of them?—They are there in large numbers, yes.

7618. You do not regard them as at present open to teaching in improved agriculture?—No, I think first of all we shall have to teach them to resort to settled agriculture before trying to teach them improved methods of agriculture.

7619. You spoke of the Cotton Transport Act as being a great success in this Presidency?—Yes.

7620. Are you satisfied that that Act has brought better profits to the cultivator?—Yes.

7621. You do not regard it merely from the point of view of the convenience of the trader?—No.

7622. It is beneficial to the cultivator as well as to the trader?—Undoubtedly I think, especially in the Surat area.

7623. We have been told that it would be a great improvement in Bombay agriculture if we could substitute wheat on a large scale for millets and coarser grains such as *bajri*?—Yes.

7624. Do you regard that as an improvement within sight?—(I am very doubtful of any improvement which contemplates interfering with the cultivator's own ideas as to what crop he should grow.) I think in some parts of Nasik District wheat could probably be profitably grown, but to attempt to replace *bajri* and these inferior millets on anything like a large scale would not I think be successful.

7625. Perhaps the seasons are not quite suitable?—The seasons, the soil and the water-supply.

7626. Experiments are being made on farms in your charge as regards the possibility of extending the growth of wheat?—Wheat is merely grown as a *rabi* rotation crop on cotton farms. We have no wheat-growing area at all.

7627. Do you desire to see one?—I desire to see one in the wheat-growing tract, but all I have been able to do is to conduct some small experiments in spacing of wheat and inter-culture of wheat; I have had no opportunities of conducting any expensive experiments in the Khandesh wheat tract.

7628. Wheat is a *rabi* crop?—Wheat is a *rabi* crop in Khandesh. There is a *kharif* crop grown under irrigation.

7629. The millets are *kharif* crops?—The millets are grown during the rains.

7630. You spoke of segregated grazing in forest areas and you anticipated some objection from the Forest Department. Can you give us any idea of what is the total area that you would ask the Forest Department to give up?—I should think, for an ordinary village cattle-breeding society, about 600 to 1,000 acres, with some water-supply enclosed.

7631. You would not want that in each of your 2,000 villages in Khandesh?—No, I do not advocate starting cattle-breeding societies in every village.

7632. What is the total demand you are likely to make?—I should think six villages in each district; six in East and six in West Khandesh.

7633. About 12,000 acres in all?—Yes.

7634. You think they are not likely to accept that willingly?—As I say, the whole progress of co-operative cattle-breeding is being held up by that difficulty at present.

7635. Sir *Ganga Ram*: I understand there are three districts in your jurisdiction?—Yes.

7636. Out of that area how much is irrigated; is there any canal there?—There are small canal systems in Nasik District; there is practically no irrigation at all in Khandesh.

7637. And wells?—There is a lot of well-irrigation all through the district.

7638. Could you give me roughly an idea of the amount of well-irrigated area?—I am afraid I could not give the actual figures.

7639. Will you let us have the information afterwards?—I can certainly give you the information afterwards.*

7640. Is any part of your district subject to famine?—The whole of the district is subject to periodic famine, some parts much worse than others.

	acres.
*Area irrigated by wells in { West Khandesh	12,194
{ East Khandesh	19,880

7641. In the last 20 years, how many famines have occurred?—I should say on an average once every five years has been very bad.

7642. In which district?—Especially in the East District of Nasik and in East Khandesh.

7643. I understand that you grow a very good area of wheat? How many times do you plough before sowing wheat?—The ordinary cultivator only ploughs his field just before putting it in.

7644. How many times?—He probably ploughs it twice and harrows it once or twice.

7645. That is all?—That is all.

7646. What yield do they get?—They get about 500 or 600 lbs.

7647. About 7 maunds?—Yes.

7648. Is that all?—Yes.

7649. You have never tried whether by ploughing and harrowing more you could get a bigger crop?—Yes, we do; we get 1,200 lbs. on Dhulia farm.

7650. How many times do you plough it?—The land is ploughed with an iron plough; then it is cross-ploughed; then it is run over by a harrow three or four times, and then it is rolled, the clods are broken down and the seed beds prepared.

7651. Do you use as propaganda to your cultivators the difference between 7 and 12 maunds?—We do; we spend a lot of time on that.

7652. Do you give demonstrations?—We do; that is one of the most important items of our work, demonstrating improved cultivation.

7653. I have seen a part of that district; there is a great channel running through; do they make any use of that water?—I do not know what place you are referring to.

7654. Is that channel of water utilised?—I believe it is being utilised now; there is a pumping plant there.

7655. Where?—On that pool.

7656. Is the whole of the water used?—It is used, yes.

7657. Why do not the Irrigation Department take it up? Does the Tapti pass through your region?—Yes.

7658. And the water is not utilised?—I think the main reason for that is that the banks of the Tapti are so extremely liable to flood.

7659. But there is no difficulty in overcoming that?—It means a considerably long lead and different lengths of pumping.

7660. That is all within engineering possibility?—Yes.

7661. But they have never attempted it?—It has never been attempted.

7662. How much water does it discharge?—I do not know.

7663. You still grow *rabi juar*; could you not substitute wheat?—(*Rabi juar* is grown in Nandurbar taluka; it is grown largely as a fodder crop)

7664. Have you ever studied what chemical properties are left in the land by each crop?—I have an idea of what the crops take out of the soil.

7665. Is it based on some scientific investigation or is it based simply on observation?—Based on what I have been taught.

7666. Could you refer me to any book on that subject?—Yes, I think most general text-books on agriculture deal with that.

7667. But is there any book dealing with special investigation of this soil?—No, I have not conducted such an investigation.

7668. And nobody has?—Not as far as I know.

7669. What is the depth of soil?—It varies considerably all over Khandesh.

7670. Between what limits does it vary?—I suppose in some parts of East Khandesh it is very difficult to get to any subsoil; in other parts there is practically no surface soil at all.

7671. You grow oil-seeds?—Yes.

7672. Merely ground-nuts and no others?—Linseed and the pulses.
7673. You do not grow rape-seed?—Rape-seed is grown, yes.
7674. Which gives the best crop?—I am afraid I cannot answer that question.
7675. You say that for demonstration purposes you paid Rs. 30 an acre. What rate per cent. on the investment does that give?—It is wheat land.
7676. Does it give a return of Rs. 500 or anything like that?—No, not as much as that.
7677. You spoke of sheep breeding; before putting the sheep on the land, do you plough it?—There is no sheep breeding; they put the sheep on for folding.
7678. Do the cultivator plough the land before putting the sheep on?—In many cases not; I think in most cases they do not plough the land beforehand, but they plough it afterwards to plough the manure in.
7679. Do you use any artificial fertilisers?—Yes, quite a lot.
7680. For what crops?—Sugarcane, and nowadays a good deal of castor cake is being used for the dry cotton crop.
7681. In cotton areas do you post up daily market prices?—No.
7682. Is it not a recommendation of the Central Cotton Committee to do so?—Yes, when there is a cotton sale society it will probably be done, but at present it is not done.
7683. Is there much wheat exported?—No, I do not think there is much, except with firms like Rallis.
7684. I suppose you have no surplus wheat to export?—There is a little export by the foreign firms, but not very much.
7685. Do they export it in its pure state or do they dirty it to get it to the London standard? In London there is a standard of Indian wheat which is very dirty?—I am afraid I have no information on that matter.
7686. Are there many big landowners in your district?—Yes, there are.
7687. Do they take a cash rent or do they participate in kind?—I think in most cases they take cash rent.
7688. They do not participate in kind?—In some cases they do.
7689. How much do they take?—A quarter or a third; it varies in different parts of the district.
7690. Taking only a quarter, they cannot make Rs. 30 an acre?—It depends on what crops are grown.
7691. What is the value of the gross produce?—The average cotton cultivator will make Rs. 30 an acre.
7692. Then if they take only a quarter, the landowner will only get Rs. 7 according to your figures. What classes of cotton do you sell?—The main cotton in Khandesh is the ordinary Khandesh mixture.
7693. Not American?—No, there is no American cotton.
7694. Khandesh cotton seed is not imported, it is the original seed, is it not?—The seed is mostly used for cattle food.
7695. But the seed is not imported, it is country seed, is it not?—It is country seed; it is not imported; it is an indigenous variety.
7696. Is it necessary to renew the seed every five years, or is the same seed used?—With the local variety the same seed goes on.
7697. The cultivator keeps his own seed?—Yes; or gets it from the ginning houses.
7698. Does the Agricultural Department guide them in getting pure seed?—The Agricultural Department endeavours to get them to grow N. R. cotton which is the important Khandesh cotton.
7699. What does that mean?—*Neglectum Roseum.*

7700. That is the one which comes from the Central Provinces?—It is also grown in the Central Provinces, but it has always been grown in Khandesh.

7701. How much do you get out of that?—The average yield for the district is not more than about 350 lbs. of *kapas*, which is about 100 lbs. of lint per acre.

7702. Is not that very low?—It is very low.

7703. What measures are you taking to improve it?—With improved cultivation and a small amount of manure, I firmly believe it can be raised to 550 lbs. per acre.

7704. Is it your goal to produce a maximum of 550 lbs.?—I have no maximum goal.

7705. What is the best yield that you can get?—The very best we ever got was 1,800 lbs. to the acre in the Dhulia farm on a small patch heavily manured with crude night-soil.

7706. That is with manure?—Yes.

7707. You have not obtained such results without manure?—Never, without manure.

7708. Are you aware that the Bombay Presidency imports onions from Italy?—They also import potatoes; they do not produce their own potatoes, do they?—A lot of potatoes are imported for seed.

7709. Only for seed?—I do not know.

7710. Do not they keep their own seed on the farm?—We do not grow potatoes in my division.

7711. But potatoes are grown in the Bombay Presidency, I suppose?—In Poona they grow a lot of potatoes.

7712. Do you grow onions?—We grow a lot of onions.

7713. Do you know onions are imported?—I do not know.

7714. How many kinds of onions do you grow, two crops?—The main crop is the cold weather crop; there are two crops.

7715. It matures in cold weather?—Yes.

7716. How is it that the Punjab imports onions for the cold weather, can you not supply them?—I do not think so. I have never considered that.

7717. They call them Karachi onions?—Yes.

7718. But they are really imported onions?—Yes.

7719. On page 440 of your memorandum you say you want help from the Government. Is it financial help that you want?—I want every kind of help.

7720. But do you want financial help?—Yes; financial help.

7721. To what extent?—To enable me to help in the agricultural improvement of my district.

7722. Have you got any borings for wells?—Yes; we have done borings in Khandesh.

7723. To what depths?—Two hundred feet.

7724. Not beyond 200 ft.?—No.

7725. Up to 200 ft. do you get any water-bearing strata?—We have struck water on several occasions.

7726. Can you let me have a section of the soil down to 200 ft.?—I have not got it at present; I have been away from Khandesh for six months.

7727. You said that Kirloskar implements are very generally used?—Yes.

7728. Which implements?—Kirloskar's No. 100 plough seems to be generally popular in Khandesh; it is very similar to the Ransome C. T. 2.

7729. Kirloskar complains that he cannot compete with foreign makers because his raw material has to pay a 40 per cent. duty. Do you recommend that he should be allowed some rebate on the duty on the raw materials for his implements, because otherwise he cannot compete with the foreigner?—P.

should advise everything to be done which will encourage the production of these implements in India.

7730. His angle iron and that sort of thing have paid a duty of 40 per cent.?—Yes.

7731. While the finished material of the foreigner comes in free of duty. Therefore Kirloskar is at a disadvantage of 40 per cent.?—I think that certainly requires investigation; and if he is handicapped it ought to be removed.

7732. In your district, is there any adulteration of cotton?—Do you mean mixing of cotton?

7733. Yes; I mean mixing some other kind of cotton with the Khandesh cotton. I understand Khandesh is rather good quality cotton?—No; it is the worst in India.

7734. *Dr. Hyder*: I desire to examine you with regard to the success of these irrigation societies and the failure of the fencing societies. How long have you been in Khandesh?—I have been since August 1921, nearly five years.

7735. You know the Khandesh tract well?—Yes.

7736. Is the water distribution by village communities a very old system?—I think it is extremely old.

7737. Is it a Bhil institution?—No. There are no Bhils; they are mostly persons of the Kunbi type.

7738. Your villages are more or less homogeneous as regards their population?—Yes; I think certain tracts are of that sort.

7739. Are there any disputes between villages just as we might have disputes between the Bombay Government and the Punjab Government; the villagers at one end might think the villagers at the other end are holding up the water and making little use of it?—We do come across instances of that kind.

7740. Under this system of distribution do you think everybody gets his fair share of water?—I think where this system has been established for a long time, everybody does.

7741. Are there people of different castes inhabiting the same village?—I think the villages are more or less homogeneous with regard to population.

7742. So, there is no suppression of lower castes by higher castes; I mean by the more numerous people?—It has never come to my notice.

7743. These irrigation channels are not owned or operated by the Government?—They are operated entirely by the people themselves.

7744. The Government has no hand in it?—I think the Irrigation Department occasionally helps in problems with regard to the maintenance of these canals or in technical problems connected with their improvement.

7745. How are the repairs undertaken?—The repairs are done by the people themselves.

7746. *Sir Ganga Ram*: They do not interfere with the regulation?—No.

7747. *Dr. Hyder*: Do you think the inhabitants of the villages make the most economical use of the water?—I think that under a system of this type they make a more economical use of the water than they do under the Irrigation Department.

7748. Do the Bhils own much land in West Khandesh?—There are a few Bhil settlements.

7749. Do they distribute the water?—On these irrigation schemes they distribute the water.

7750. What are the essential factors for the success of such a system, if it is introduced in other areas?—Collective action is absolutely necessary, and the adoption of a suitable rotation for the crops.

7751. Collective action is the essential thing?—I think so.

7752. Distributing this water without any modules, everyone will get a fair share?—No complaints as to water distribution have come to my notice.

7753. Do people whose land is situated at a distance from the channels complain?—In all my experience of this system I have never had any complaints.

7754. Have you heard of this system of distribution by village communities being used anywhere else?—I think Dr. Mann endeavoured to organise such a society in one district, but that is all.

7755. *Sir Chunilal Mehta*: In reply to Sir Henry Lawrence, you said you would require another Rs. 40,000 to carry out your propaganda work. Do you base that on any calculation?—I was roughly calculating to have a District Agricultural Overseer in each taluka.

7756. That is all the assistance you require?—I should like to begin with that.

7757. It seems to me you would require a good deal more money for all the various activities you have mentioned here?—I have no doubt I could do with it.

7758. On page 439 you advocate research in regard to other crops on the lines of that at present being conducted by the Indian Central Cotton Committee?—Yes. I suggest that in the organisation of research in a Province the framework used by the Indian Central Cotton Committee should be followed. In place of the Cotton Committee there should be a provincial research committee, and in place of the Provincial Government which submits its proposals for research to the Cotton Committee there should be the district workers and the central expert who should submit their scheme for research in particular areas to the provincial research committee. Instead of the funds of the Cotton Committee there should be a special fund administered by the provincial research committee. I am drawing a parallel between the organisation of the Indian Central Cotton Committee and the Provincial Governments in cotton research and what I suggest for the organisation of research within a Province.

7759. Where does the Minister for Agriculture come in in this scheme?—He would occupy the same position as the Agricultural Adviser in the Cotton Committee scheme; he would be the President and final controller.

7760. You would have the Minister as President?—If not that, he should have the power of veto and exactly the same powers as the Government of India have over the Cotton Committee.

7761. On page 448 you give the causes of agricultural indebtedness. Is inadequate finance or over-finance one of those causes?—The only point I can mention in that regard is that 26 per cent. of the cultivators took advances from both the co-operative credit societies and the *sowcars*. That seems to indicate inadequate finance by the societies.

7762. Since 1923 steps have been taken to finance the cultivators in Khandesh through co-operative societies on a very much bigger scale than before?—Yes.

7763. You do not think that has had the required effect yet?—I think it has improved matters considerably.

7764. On page 450 you are talking of minor irrigation schemes; there is not much canal irrigation in your district?—No.

7765. Nor is much possible?—No.

7766. Do you anticipate much use of these minor irrigation schemes of the type you mention?—I refer to a fact which must strike anyone who visits the district, i.e., the remarkable number of abandoned irrigation works on the rivers and *nullahs* of the district. It seems to me the water which at present runs down the *nullahs* and escapes might be utilised if some of these old works were resuscitated.

7767. Do you know the reason for their abandonment?—I should think it was due to successive famines. Their history goes right back beyond the Mussalman period.

7768. There is water in them now?—Yes, in the rainy season.

7769. And not used?—No.

7770. *Dr. Hyder*: Why were they abandoned?—I do not know. They are found near every village and river in West Khandesh.

7771. Have the lands gone out of cultivation?—They are growing dry crops.

7772. But before?—They must have been growing irrigated crops.

7773. *Sir Chunilal Mehta*: The examination of such sites and schemes is one of the important functions which Mr. Lowsley is to perform?—Yes. I think it very important that these should be examined.

7774. On page 451 you say you submitted a list of recommendations to Government from the committee over which you presided. Do you know what has happened to those recommendations?—No.

7775. It was some little time ago?—Yes.

The only note I find here is that on account of want of finance the scheme has been held up.

7776. On page 460 you speak of Animal Husbandry. This farm at Shirpur was started by a non-official agency?—Yes.

7777. Do you know whether they tried to introduce a good milk strain in their animals?—They were trying to do so.

7778. Is it your view that even for Khandesh we should aim at a dual purpose animal?—I think so, wherever there is a breed suitable for it.

7779. Have you such breeds in your district?—I think there are two which would be suitable.

7780. When that society was started it got a sufficient area of land from the forest?—That is so.

7781. That being so, is there any reason why cattle-breeding societies should not be able to get land from the forest?—I think the reason they got this land was probably because it was the first attempt in the district, and they were fortunate in getting the District Collector to push the scheme and help them.

7782. There is plenty of forest area in your district?—Yes.

7783. This land could be made available?—I think it ought to be.

7784. In fact, the Forest Department are trying to help you in this, so long as the important timber trees are not damaged?—Yes. They are very sympathetic, but they seem to be bound down by certain definite regulations with regard to injury to trees and so on.

7785. Is not the water-supply in these areas one of the difficulties which prevents the use of them for these purposes?—In most cases, if there is not a source of water-supply in the actual area, the forest people are always willing to give a channel through the forest to a proper source of water-supply.

7786. On the same page you refer to owners of good cows. Are there many owners who possess herds of good animals?—There are more cows than buffaloes in Khandesh.

7787. Are there individual private owners who possess good herds?—Yes.

7788. Do you believe in stall feeding for the animals? For breeding purposes, would you prefer stall feeding or have them graze in the forest?—In the majority of cases I would prefer grazing in the forest.

7789. The grass is enough?—They could graze all day, and that could be supplemented by cake when they were brought in.

7790. That would have to be done?—That is necessary, especially if the aim is to improve the breed.

7791. On page 464 you say the Government should provide very much larger funds for the development of the co-operative movement, and you add "by expending these funds..... through every agency which is capable of extending the movement among the cultivators." What exactly do you mean by that, "every agency which is capable of extending"?—I mean that a great deal could be done to extend propaganda in favour of co-operation in the

villages through agencies such as the Irrigation, Revenue and Agricultural Departments, and still more by non-official agencies.

7792. Do you propose to pay the non-official agency?—No. I suggest, for instance that members of the Taluka Development Association committees, who are probably educated men and understand the value of the co-operative movement, should have certain travelling expenses paid to enable them to go to the villages and tell the cultivators about the movement.

7793. That is the extent of the assistance you would give?—That is one way in which I would utilise these funds.

7794. Do you consider the maximum grant of Rs. 1,000 payable by Government to Taluka Development Associations is not justified?—I consider it quite justified; I was in favour of it, and tried in my own Division to get it increased; but I think it was a mistake not to give men instead of money.

7795. Is not there a condition definitely laid down for the creation of these associations that the grant from Government depends on the fact that they employ a paid man to carry out their work?—Yes, and that they should collect a similar sum themselves.

7796. If they are taking the place of your non-official agency, what objection could you have to paying them for the specific purpose of appointing a paid staff?—The only reason I make that proposal is that experience shows that now for every new development they come to Government for another subsidy.

7797. But they do not get it?—They may not, but they ask for it, and that is something one should not find in an association which ought to be purely of a co-operative character.

7798. Do you agree that such an association ought to have a paid man under it?—Certainly.

7799. The former associations failed because there was no paid staff the association could hold in any way responsible?—Yes.

7800. That was the reason why this was the only condition laid down for the formation of Taluka Development Associations?—Yes.

7801. The type of man employed by these associations is not as good as you would like?—That is so.

7802. Would you not require to pay them more to get better men?—No. I think you could get good men at the same price.

7803. You are paying Rs. 50 to Rs. 60 a month?—Yes.

7804. Is that enough?—You could get the fieldman type of man suitably trained at that price.

7805. If a higher type of man were employed, would you object on principle to Government paying the association sufficient to cover that expenditure?—Very much. I would prefer Government to give the man.

7806. Who would control him?—He would be entirely under the control of the association.

7807. Where the system of giving a man from Government service has been tried, has it not been found that the man considers himself independent of the association?—That difficulty could be overcome by supervision by the local officers of the Agricultural Department.

7808. Our experience was the association did not feel he was their man until he was paid by them?—I refer to the case of Pachora, where an agricultural graduate was engaged with the subsidy given by Government. After two years they found the receipts from their own people were falling off, and they dismissed him. If they had known that man would be there for three years, paid for by Government, they could have gone on developing internally without having to consider the position of this man's pay year by year.

7809. If the members of the association will not pay the money even to carry on with a small staff, is it worth while continuing the association?—I think if you had a suitable man he could organise the collection of subscriptions very much better than someone of the fieldman type.

7810. Has the Cotton Transport Act been tried in any other Province?—Yes, Madras.

7811. How is it working?—Well, but they are having more difficulties, because the area is not so well defined as in Bombay.

7812. You suggest the appointment of an agricultural *patel*?—Yes.

7813. Do you consider he would be a sufficiently important man to employ for general rural development?—I would not give him any executive powers at all; I merely want to have an agent in the village to whom my local staff could go and say "I want some help in organising a demonstration in this village; will you arrange to call a meeting of the people?" and that sort of thing.

7814. *Dr. Hyder*: Besides the *patel* responsible to the police authorities, have you in your villages men who could undertake such duties?—In the larger villages of Khandesh we could get men who would do this work on an honorary basis.

7815. *Sir Chunilal Mehta*: You would like a higher type of man to take up the problem of rural development as a whole; the idea would be to get the cultivators to help themselves?—Yes, always.

7816. You would also like to have a higher type of man employed by the Taluka Associations, or would you have someone like this agricultural *patel*?—You would have to have a higher type of man as well.

7817. Have you examined the question of roads and transport in your districts?—I have made no particular examination of that question. I know there is great difficulty in certain parts of Khandesh owing to inadequate road facilities.

7818. You have not studied the question of whether a certain amount of money spent on new roads in the village areas would yield a return by giving a better return to the cultivators?—No.

7819. You only say a few words in your memorandum on spare-time occupations for cultivators?—Yes.

7820. In the districts with which you are familiar, do the cultivators have enough time to devote to other occupations?—Yes; about half the year. They do a lot of carting.

7821. Does everybody do carting?—Most of the cotton cultivators do.

7822. Have you considered whether there is any other spare-time occupation they might take up?—I should like to see them take up such things as cattle-breeding. I do not believe in turning cultivators into weavers.

7823. *Dr. Hyder*: Is weaving looked down upon as being the occupation of a lower caste?—I do not think so. In some parts of my Division it is very important; but I think the agriculturist could more profitably occupy his spare time in more agricultural pursuits.

7824. *Sir Chunilal Mehta*: If you could provide wells they could do agriculture all the year round, but is such a thing possible all over the district?—No, but wherever it is possible it should be encouraged.

7825. The first and whole-time occupation of the cultivator ought to be agriculture?—Yes.

7826. I agree, but where there is of necessity spare time, would you rule out hand-weaving?—No, but I do not think it will be introduced successfully except where it can be done on co-operative lines.

7827. *Sir Ganga Ram*: With well irrigation, how big an area does a well command?— $2\frac{1}{2}$ to $2\frac{1}{2}$ acres.

7828. For the sake of $2\frac{1}{2}$ acres they lift water from what depth?—30 feet. It varies, of course.

7829. Does it pay them to do that for the sake of $2\frac{1}{2}$ acres? What can they grow on $2\frac{1}{2}$ acres that will make it pay?—They can grow valuable garden crops, which will give a profit of Rs. 200 to Rs. 300 an acre.

7830. That would be Rs. 500 for 2½ acres. What is the cost of lifting the water?—A couple of bullocks will only cost Rs. 1-8 a day.

7831. You are positive about that 2½ acres?—Not absolutely positive; I think it is that.

7832. When is the cotton finished with?—Generally the harvest is over by the end of December.

7833. What do you sow in the same field next?—Generally cotton again.

7834. Cotton on cotton?—Yes; that is common in Khandesh.

7835. That ruins the land?—The normal rotation is cotton and *bajri*.

Sir Ganga Ram: We put wheat on cotton.

7836. *Mr. Calvert*: In your memorandum you mention co-operative fodder storage; is that a practical business proposition?—I think if it was run on business lines, getting contractors to do the storage, it would be in Khandesh.

7837. We had some evidence that the Forest Department's effort to store fodder resulted in a loss. Could a co-operative society do it profitably?—I see no reason why they should not. In Khandesh prices are high.

7838. In answer to *Sir Ganga Ram* you gave Rs. 30 an acre as the cultivator's profit on cotton cultivation?—Yes.

7839. In arriving at that figure, have you deducted wages for the labour of the cultivator and his family?—Yes. That includes Rs. 27 for additional labour of his family, interest on capital, etc., Rs. 27 has already been deducted; Rs. 30 is profit.

7840. Have you a figure like that for wheat?—I have not worked it out; I only prepared figures for the cotton crop, in which I am chiefly interested. I think it is considerably less.

7841. Allowing for wages for the cultivator and his family, would wheat cultivation show a surplus?—I think it would, but a very much smaller one; probably Rs. 9 or 10.

7842. *Professor Gangulee*: You mentioned cattle-breeding as a subsidiary occupation. We were told in Poona that cattle-breeding is not a paying proposition; what is your view on that?—It is rather a large statement to make.

7843. *Sir Chumilal Mehta*: The cattle-breeding association wanted to hand all operations over to Government because it did not pay?—No, because they could not supervise it; that was the difficulty. It is in an isolated part of the forest.

7844. They are getting a subsidy from Government now?—Yes.

7845. *Professor Gangulee*: Could a Taluka Development Association make a start without the help received from Government? Is there sufficient enthusiasm among the people to start an association without Government assistance?—Undoubtedly.

7846. They could do it?—In some talukas in Khandesh they had already collected very large funds for the purpose.

7847. On page 447 basing your argument on the success of the Indian Cotton Committee, you give it as your definite opinion that an active central organisation dealing not only with research, but with other equally important factors of rural development, has an important place to fill in the development of Indian agriculture. Further, on page 464, you suggest a Rural Development Department, and indicate the nature of the organisation, its constitution and finance. Crystallize your thoughts in a definite form and give us an indication of what organisation you would have for this Rural Development Department; how would it function; what would be its constitution, and so on?—I feel that if I were called upon to organise some means of agricultural improvement in an entirely fresh area, from my experience in the districts of Khandesh, I would not go about it by organising an Agricultural Department and a Co-operative Department.

7848. How would you deal with the situation as a whole?—I would organise a department with a rural development association under the Provincial Go-

vernment. The research in my new area would be under the Central Government. I do not know what department I would put urban co-operation under; I should probably put it under municipalities or something of that sort. This Rural Development Department would take into account, from the very start, the potentialities of co-operative organisation in extending agricultural improvements and would not just come in at a later stage and have to build up a sort of adult co-operation.

7849. Who would control this Rural Development Department; would it be under the Minister in the Provinces?—Yes; it would.

7850. Would you consider irrigation to be one of the factors that ought to be taken into consideration by the Rural Development Department?—I would rather keep irrigation out of this altogether; I would co-operate with them in every way; I should also leave forests outside, because after all Irrigation and Forests are revenue producing Departments.

7851. You would have no central organisation to direct the Provincial Rural Development Associations?—We would have very much the same organisation as we have now. Only instead of having an agricultural and a co-operative department, we would have a Rural Development Department; research in the Provinces would be conducted by an All-India Research Board such as I suggest in my Administration note.

7852. *Dr. Hyder*: You would have district research?—I am supposing that a new Province would be organised; I am afraid we cannot do that nowadays; things have gone too far.

7853. *The Chairman*: Do you think it would be helpful if a medal or some such decoration were given to leading cultivators or landholders who take a prominent part in research or organisation or improvement?—Yes, I think so; it has been done.

7854. Have you anything of the sort in the district you know so well?—Some of the associations have given medals and certificates to prominent workers.

7855. Have they been appreciated?—Yes, especially when presented by the Collector of the district or some official.

7856. They require a ceremony?—Yes.

7857. No doubt they are worn at agricultural shows and so on?—Yes; they are very proud of them.

7858. On page 456, in order to encourage better cultivation your idea is that rebates of land assessment fees should be granted to cultivators who obtain good tillage certificates from the local senior officer of the Agricultural Department. You would not, I suppose, put those certificates in the hands of Revenue Department?—I would; the Revenue Officers I have met in Khandesh; I certainly would.

7859. They are in favour of it?—Yes.

7860. Do you know the official view of the Revenue Department as such, on any scheme of this sort?—I do not know.

7861. Do you know what it would cost to revenue?—That would naturally depend upon the number of certificates one is allowed to issue.

7862. Before deciding on the policy you would have to form some estimate?—Yes.

7863. I am not criticising; I merely wish to know whether you have measured the problem from the revenue angle?—The land assessment is Rs. 4 to Rs. 5 an acre.

7864. If progressive agriculture is to be financed, Government must have a fair share of the increment, the result of the improvement; otherwise, the more important expenditure required in the future for agricultural research and demonstration cannot be financed. Here you are straightway not increasing but reducing assessment as a direct consequence of improvement of the

fertility of the land, are you not?—Yes; but I consider that Government would obtain an increased revenue in the long run resulting from this improved cultivation of the land.

But that would take a long time, would it not?

7865. *Mr. Kamat*: Some of the agricultural associations in Khandesh are doing excellent work, are they not?—Yes.

7866. Have they attempted cattle improvement or cattle-breeding on their own account?—Two agricultural associations have done nothing else so far.

7867. You are of opinion that cattle-breeding is a practicable proposition in Khandesh?—I think so; yes.

(The witness withdrew.)

The Commission then adjourned till 2-30 p.m. on Tuesday, the 2nd November 1926.

APPENDIX.

Summary of recommendations "on the manufacture of manure from night-soil and on the extension of that manure in the North Central Division of the Bombay Presidency."

(a) In large villages, towns and municipal areas, the minimum number of public latrine seats, provided for the use of the people, should be 10 per 1,000 of population.

(b) Greater care and forethought should be exercised in the siting of public latrines.

(c) Collection of crude night-soil should be invariably done by crude night-soil carts and not by tins and baskets carried by *bhangis*. Municipalities should satisfy themselves that they have sufficient cart accommodation to deal with the daily output, without imposing undue strain on servants and bullocks.

(d) Staff on the scale laid down in the Manual of Public Health and Vital Statistics (Dr. Munsiff) should be maintained.

(e) The Nasik system of converting crude night-soil into poudrette should be standardised and universally adopted. The use of crude night-soil, as such, for manurial purposes should, except under exceptional circumstances, be discontinued.

(f) Government should establish a training class at Nasik under the direction of the Public Health Department and the Nasik Municipality, where men, sent from various towns and municipalities in the Division could receive a thorough training in the Nasik system of disposal of crude night-soil. This training class should be commenced as early as possible.

(g) All large towns and municipalities should be invited to send a suitable man to Nasik for a course of training as indicated above.

(h) Poudrette produced by municipalities, etc., should always be sold by public auction and such auctions should be well advertised among the surrounding cultivators. The systems of sale by private arrangement and by contract should be discontinued.

(i) Village Sanitary Committees should be started, as an experimental measure, in villages with populations between four and eight thousand. These Committees should receive a grant from Government, in direct proportion to the sum raised locally, to assist them in their work.

(j) Government should appoint a small committee consisting of representatives from the Public Health, Public Works and Agricultural Departments, along with one or two non-official gentlemen to supervise these experiments in village Sanitary Committees and ultimately to draw up a detailed scheme for adoption by such bodies.

(k) A suitable officer, trained at Nasik Depôt, should be deputed to visit other towns and municipalities, lecture on the Nasik system of poudrette manufacture and assist local governing bodies to organise the disposal of their town refuse on the best lines.

(l) Demonstrations of the value of poudrette as a manure should be systematically arranged by the Agricultural Department in consultation with Municipalities, etc.; plots should be laid out and meetings of cultivators arranged to inspect them.

(m) Short leaflets in the vernacular on the value of poudrette as a field manure, should be prepared by the Agricultural Department and circulated in the villages.

Tuesday, November 2nd, 1926.

BOMBAY.

PRESENT :

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

Sir HENRY STAVELEY LAWRENCE,
K.C.S.I., I.C.S.

Rai Bahadur Sir GANGA RAM, Kt.,
C.I.E., M.V.O.

Sir JAMES MACKENNA, Kt., C.I.E.,
I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Professor N. GANGULEE.

Dr. L. K. HYDER.

Mr. B. S. KAMAT.

The Hon'ble Sir CHUNILAL V. MEHTA.

Dewan Bahadur A. U. MALJI.

Mr. J. A. MADAN, I.C.S.

Mr. F. W. H. SMITH.

} (*Co-opted Members.*)

} (*Joint Secretaries.*)

Rao Bahadur P. C. PATIL, L. Ag., M. Sc. (in Agricultural Economics), Professor of Agricultural Economics and Acting Principal, Agricultural College, Poona.

Replies to the Questionnaire.

General Statement.

Improvement of agriculture, in an old country, is not an easy task. It does not mean that Indian agriculture is perfect. But looking to the different factors of production and the natural and economic conditions under which Indian agriculture is carried on the matter is not easy as perhaps many think.

Indian agriculture is perhaps 5,000 years old and the methods are crystallised by long experience. One can easily increase the produce per acre but the question is whether it is possible to do so economically, as the law of diminishing returns sets in early in agriculture and more so, where the methods are crystallised.

The Indian farmer has shown not only willingness but keenness in adopting improvements which promise to pay him. The prompt acceptance of iron ploughs, sugarcane mills, power crushers, concentrated manures (as fish, oil-cake and ammonia sulphate), selected seeds (as the strains of cotton, ground-nut, rice, etc.), amply testify his keenness. One often sees weedy fields and unimproved lands and forms poor opinion of the farmer. To such man I would only request to look into the natural and economic conditions besetting the farmer before jumping to such conclusions.

To my mind, the improvement of agriculture and agriculturists requires careful consideration of many things some of which are detailed below :—

- (1) The factors of production (land, labour, capital and management), their quality, quantity and the proportion in which they are available for combination.
- (2) This naturally follows the study of the cost of production and

- (3) the study of the distribution and marketing.
- (4) The property rights including the land policies and tenancies.
- (5) The availability of credit and the facilities for organising the same.
- (6) Rules and regulations regarding land, labour, trade and commerce including the question of tariff.

While treating each of the above-named factors, I do not wish to theorise but try to give their bearing on the labour incomes and profits of the farmer in India (especially of the Bombay Presidency).

(1) *Factors of Production.*

(A) Land:—

It may, at the outset, be said that the land available for cultivation per family and *per capita* in India especially in the Konkan, Gujarat and western parts of the Deccan is *insufficient*. In the eastern parts of the Presidency, the holdings are large but the *amount of rainfall and its distribution is poor*.

There are several countries in which the cultivated area per head is less than in India. One thing, however, which many people forget is that in India the *proportion of agricultural population to that engaged in other vocations is largest*.

As a result, the farmer as a business man, gets very little land to work. In India, about 70 per cent. of the population is engaged in agriculture whereas in the United States of America only 37 per cent. of the population is engaged in agriculture.

As a result the area available per farmer in the Bombay Presidency may be about 12 acres. In the United States of America the average farm is about 160 acres and in England which is a crowded country it is perhaps 60 acres.

In this connection, I append a note which I had once drafted which shows some possibilities of the adjustment of population and cultivated and cultivable area.

(B) Labour:—

I think we have plenty of labour. Some of our farmers complain that it is costly and that they cannot afford to pay the market rate of wages; this is not due to the scarcity of labour. It is more due to the small labour income which the cultivator makes and he naturally grumbles to pay more than he can make himself.

(C) Capital:—

The amount of capital available in India is small. Unless there is surplus, capital will not accumulate. In agriculture as it is carried out, there is very little or no surplus.

Capital, moreover, is shy in India and so it is costly. In the year 1920-21 in Wisconsin (United States of America) the average rate of interest for agricultural capital was between 4 and 4.5 per cent., whereas in India it varies between 12 and 20 per cent.

(D) Manager or Farmer:—

On the whole, the Indian farmer (I can at least say about the Gujarathi, Khandeshi, Konkani and West Deccan farmers) is not an ignorant fool. Where nature responds, he works hard. Where nature does not respond, it is true, he takes things easy and becomes fatalist.

I have seen and known some farmers (whom the Europeans will call peasants) on the canals, taking life easy and not working hard themselves. This seems to be due to the comparatively better economic condition of his. If such men put in as hard work as the Mawal peasant does, certainly he will do better. I, however, am not inclined to think that even the farmer on the canal is a spendthrift.

If the costs of production is charged at the market rates, generally there is no profit left for the cultivator. He, however, continues in his business, because of the inertia and want of opening elsewhere.

I have been financing about ten peasants at Wadgaon (in the Kolhapur State) for the last ten years. I do not take bonds and in fact ration the finance by giving money only at a time when it is required and charge interest at nine per cent. Since these people are in partnership with me in sugarcane plantation, the receipts of the produce (*Gul*) come to me from which I take interest and part of the capital if I can. But my finding is that with all my care, except in one case where the man has purchased additional land all others either lost part of their land or have their debts increased.

In the marginal industry cheap capital means only extending the lease of life of that industry.

In another observation, I found the same thing. A piece of land about 8 acres in area and assessed at Rs. 40 used to be rented at Rs. 180 (when auctioned by the *mamatdar*). After watching this for a number of years, a gentleman whom I know and trust, got this land from the State. He has now given this land to a near relative of his, on share rent, and takes half the produce (except fodder) on the thrashing floor. I have watched his receipts, they vary between 100 and 120 rupees only, and yet in auction the land will surely fetch much more. It is so because of the scarcity of land.

I have been watching the costs and receipts from particular fields near Poona and of some partnerships growing sugarcane in the Kolhapur State. The two years under observation were not bad years and yet there is very little labour income for the owners and workers of these lands.

Cost of Production.

The cost of production began increasing with the commencement of the World War and probably rose to the highest pitch in 1921. The prices of agricultural products also were increasing along with the costs and in the case of some commodities, the rise of the prices was proportionately greater.

Since about 1920 prices are on the decline. The costs also declined but they lagged behind. In many cases the prices of agricultural commodities have come down to the pre-war level whereas costs have remained high and this has brought about the present agricultural depression.

Taking the case of sugarcane, it may be said that the price of *gul* was probably Rs. 18 to Rs. 20 per *palla* in 1913. It rose as high as Rs. 40 and even Rs. 50. It has steadily gone down and last year it was only Rs. 23 or less.

On the side of costs, sugarcane mill (Bari) used to cost Rs. 125 to Rs. 140 before the War. The price rose up to Rs. 250 and has now (1926) come down to only Rs. 220. Kerosene oil used to cost Rs. 4.37 per case in 1911. Cost of the same in 1925 was Rs. 7.35. Clothing per pound was Rs. 0.59. In the year 1925, it was Rs. 1.1. It may therefore be said that the costs have not fallen in proportion to the prices of agricultural commodities.

It seems very desirable that the study of cost of production be taken up seriously, with a view to find whether these cannot be reduced.

Distribution and marketing.

Exchanging commodities for cash is only a part of marketing. Improvements of marketing in broad sense require the improvement of—

- (1) Marketing services including
 - (a) grading of commodities and standardizing them,
 - (b) transport (railways, roads),
 - (c) use of standard weights and measures,
 - (d) processing of commodities,
 - (e) providing adequate storages and ware-houses,
 - (f) financing, etc.

(2) Marketing methods of which I strongly recommend Integrated system where if possible the farmer should have interest in assembling, grading, processing, financing and distributing.

(3) Marketing agencies of which I recommend co-operative marketing.

Suggestions regarding improving marketing services.

1. *Transport.—Costly transport.*—It can be said that Indian farmer has to spend proportionately more on transport. The communication from the farm to the village and from the village to the market is poor. It not only costs more but increases the depreciation charges of the carts and bullocks.

As regards railway transport, it is observed that adequate number of wagons cannot be got in the harvest season. In the year 1924-25, the sugarcane-growers and merchants of Poona found great difficulties to move *gul* out of Poona and prices fell materially.

Railway transport costs about 50 per cent. more for wheat in India as compared to America.

For my lectures last year, I compared the freights and they were as under:—

Cost in rupees to move one ton of wheat for 200 miles.

	Rs.
United States of America	7.56
Madras and Southern Mahratta Railway	10.32
Great Indian Peninsula. Railway	11.06

2. *Godowns, Ware-houses and Storages.*—These have considerable influence in stabilizing prices.

I think in the year 1924-25, there was no room to ware-house *gul* and the need of godowns was materially felt at Poona, Kopergaon and for ground-nut last year at Kolhapur.

It seems necessary to encourage ware-house. As co-operative sale gains ground, co-operative ware-houses and elevators will be necessary.

3. *Too many middlemen.*—Want of opening for the teeming population of the country has brought in too many middlemen between the producer and the consumer. Each middleman handling a small business naturally increases the marketing costs.

Co-operative Sale Societies of the producers on the model of the Haveli Gul Sale Society at Poona, will not only reduce the cost but will bring the cost of the services to the producers. The Poona Gul Sale Society, after paying the expenses and dividend on share capital, have paid per cart of *gul* about twelve annas patronage dividend on the business transacted by the members.

4. *Too many varieties of weights and measures.*—The large number of different kinds of weights and measures is most confusing and uneconomical. No other civilised country would have tolerated the waste of energy and the clumsiness in exchange involved by the want of uniformity in weights and measures.

5. *Necessity of maintaining quality.*—I think the Gujarat farmer has learnt to his cost the value of maintaining quality of his cotton and especially the Bombay trade has given good response. The Department of Agriculture has done very useful work in this direction by way of developing suitable strains (as 1027 ALF, D.G.N.R., etc.), of cotton for particular tracts and getting the legislature to enact certain laws. Ground-nut crop lends for similar work and it will pay to investigate this crop as well. While I was Deputy Director of Agriculture, some attempts in this direction were made in 1922-23 and 1923-24 and I believe it is continued.

6. Markets for perishable goods such as fruit and potatoes cannot be improved in the hands of private people. They need help of the Government, Municipality and Railway companies.

Suggestions for improving marketing.

(1) It is very essential that the question of marketing the farm-products should receive special attention of the Government and the Universities. For this purpose, the Central as well as Provincial Departments of Agriculture should open marketing sections and the Agricultural Colleges, introduce Agricultural Economics and marketing in their curriculum. The earlier they grapple with this important question, the better it is.

(2) I have in the beginning of this chapter said that I would prefer integrated method and co-operative agency. In fact, Co-operative Sale Society (in the primary market) can, with the help of the Co-operative Credit Societies, achieve this. For example, the Gul Sale Society at Poona is selling the *gul* (about one-third of the total coming in Poona) for the members of the different co-operative credit societies (round Poona) who finance the members (sugarcane-growers). One of the manure societies, in addition, supplies concentrated manures. The Sale Society sees that the loans, taken by the member from the credit societies, are first returned. Since the members accept deferred payments for *gul*, the Sale Society does not require outside finance on large scale. At this stage, I, however, like to make it clear that it is no use increasing the number of Sale Societies unless they are founded on strong co-operation of the producers only. Never mind, if the growth is slow but never take from the beginning any man who is not a producer of that commodity or who is interested in the sale organisation elsewhere.

General suggestions.

Present civilisation tends towards raising the standard of life. In America one sees the labourer going in for piano, motor-car, vacuum cleaner, etc., by instalment system, paying his future income. In England the miner is fighting hard to maintain his high standard of living.

In India also the standard of living is rising. The cultivator was satisfied with simple food and scanty clothing. Contract with European civilisation has brought in petty luxuries such as tea, sugar, finer clothing, etc. He, however, has bought these luxuries at the expense of necessary food. He cannot afford to have these luxuries and yet does not give these up. It seems very necessary for Indians to adopt plainer life.

The balance between food and non-food crops is disturbed. Crops like cotton, sugarcane, coffee, tea and oil-seeds have displaced considerable area of *jowar* and *bajri*, with the result that sufficient food is not raised. It may be contended that cotton and sugarcane bring in more profits. I do not subscribe to this view. Moreover the extension of cotton and sugarcane in other countries has depressed and is likely to further depress prices of these products.

Since in India rural interests predominate it seems necessary to create opinion in favour of rural life in all matters and to discourage luxuries, which are unnecessary and which we cannot afford to pay for. It is equally necessary to re-establish the old balance between the food and non-food crops. It will not only help the country to produce more food for her large population but will also help her to produce more fodder for the cattle.

As will be seen from my answer to the question 17—Agricultural Industries—it does not seem necessary to introduce power machinery which displaces manual labour. Perhaps power machinery doing the work of cattle may be useful, as with the growth of population, marginal land, which grew grass and fodder, is put to crops more and more and the question of feeding cattle is becoming more difficult.

Wherever necessary, the help of legislature may be sought, but the most essential thing is to create opinion in the interest of the rural population.

QUESTION 1.—RESEARCH.—(a) and (c) Research on crop production including plant breeding, plant pests can be said to be going on well. Some of the sections in the Provincial Departments are, however, under-manned. Research on marketing including co-operative marketing, farm management (including cost study) is essential.

At present we go in for producers' societies (as Sale Societies) and consumers' societies without first knowing the marketing costs charged by the middlemen and without considering if these are reasonable or not.

Research in marketing of different farm produce in different tracts is essential before attempting improvement of marketing or opening co-operative sale organisations.

QUESTION 2.—AGRICULTURAL EDUCATION.—(iii) Yes.

(iv) No. Attendance is not satisfactory. Majority of the peasant farmers is poor and the farmer likes to utilise the services of his children on the farm and to tend his cattle. Moreover boys who learn up to vernacular V or VI do not like manual work on the farm.

Majority of the teachers themselves being drawn from communities not accustomed to manual labour, unconsciously impart their dislike for manual work to their pupils.

Recruiting teachers from agricultural communities and training them in agriculture as is done for preparing teachers for bias schools will improve the situation.

(vi) Yes.

(vii) and (viii) The course attempted for bias schools seems to be satisfactory. The main idea should be to create love for farm work and encourage observation. The school plots and nature study are of course very essential.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) and (d) Demonstration plots on the farms of cultivators have proved very useful in introducing—

- (1) Iron plough and sugarcane mill (Iron) in the Deccan.
- (2) N. R. cotton seed in Khandesh.
- (3) Use of sulphate of ammonia in Poona, Nagar, Nasik and Satara districts.
- (4) Wide method of planting sugarcane.
- (5) Poona furnace in Nasik, Satara and Karnatic.
- (6) Multiple furnace in the canal tract.
- (7) Use of fungicides.
- (8) Strains of rice, cotton and sugarcane and so on, are good examples.

(b) and (c) Demonstrators should, as far as possible, be drawn from a community for whose benefit the demonstrations are arranged, as the man then can move freely with such men. The community believes one of their own men more readily.

QUESTION 4.—ADMINISTRATION.—(a) Provincial Departments will seek—and I believe do seek—assistance from the Government of India where they think useful help is available. I, as Deputy Director of Agriculture, Southern Command Division always availed myself of the assistance of Rao Saheb Venkatraman, the Sugarcane Expert. I had to draw upon Rao Saheb Venkatraman because we have not got sugarcane breeder and because I knew that Rao Saheb Venkatraman could assist us.

I, however, think that it is better to make the Provincial Departments complete units by providing all sections.

As the Agricultural Departments are steadily Indianized it seems necessary to give more facilities for the Indian officers (both of Imperial and Provincial grades) to attend Agricultural Boards and get in touch with the workers in different Provinces and at Pusa. So far as I know, no Indian officers (except from the States) are invited or deputed as Members of the Board of Agriculture and perhaps the want of personal touch and acquaintance is responsible for the want of close co-operation between the Central and Provincial Departments.

I am sure that the Indian officers are doing as good work as European officers and perhaps the former have advantages to know the real difficulties and problems of the land, inasmuch as they can mix and talk more freely with the agriculturists.

In certain branches, for example, in the study of Agricultural Economics, Land Economics, Marketing and Co-operation, the Central Government has better facilities and if these sections are opened by the Government of India and by the Provincial Governments, certainly the Central Government can render more effective help. The question of railways, roads, tariffs, weights and measures are very useful subjects to be tackled by the Central Department.

The Central Government, by studying the supplies and demands of several Provinces and of foreign countries, can direct the producing Provinces to send the several products where these are in demand. The Federal Department of Marketing at Washington and the several State Departments, working in co-operation, are rendering very useful services to the farmers in the United States of America.

(c) (i) As I have indicated in my general statement (under Marketing) the Railway Freight on Agricultural commodities should be lightened. Tracts like Kanara should be opened by opening railway lines and facilities of docks given to bunders like Ratnagiri, Vengurla, etc.

(iii) The trunk roads, though few, are good. There is necessity of having more second class roads to connect villages with primary markets.

(iv) I do not think that the farmer or the Provincial Departments of Agriculture get much useful help from the Meteorological Department.

QUESTION 5.—FINANCE.—(a) The Co-operative Department of the Presidency and the people taking interest in co-operative work have done a great deal to offer credit, especially short-term credit, to the cultivators. Except in few isolated areas the cultivators' economic position is not improved. Provincial Co-operative Banks are giving assistance to the Government and the people.

The important question is whether the farmer can repay the loans. Agriculture, on small scale, in most parts of Bombay is a marginal industry. There is no surplus and unless there is any surplus cheap capital cannot help the cultivator.

(b) There is no question of inducing cultivators to take *taccavi*. He takes *taccavi* or any kinds of loans as fast as they are made available.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) The marginal nature of small scale agriculture in India is the main cause. Litigation and heavy court charges. In the Indian States changes in laws increase litigation.

(ii) The village *sowcar* and co-operative credit societies are the main sources of credit.

(iii) Causes of preventing repayment.

(1) Marginal nature of small scale agriculture.

(2) Insufficiency and ill-distribution of rainfall.

(3) Deaths of cattle by epidemic. In a little village of 60 houses 15 mote bullocks (worth about Rs. 1,500 to Rs. 2,000) and several milch cattle died within 15 days. It will be years before such losses can be recouped.

(b) Perhaps very careful rationing of finance at low rate (not more than 6 per cent.) may help the farmer as he otherwise cannot pay his debt back.

(c) Limiting the right of mortgage and sale sounds hard and looks as if personal liberty is tampered with. But under Indian conditions perhaps it is better if restrictions are put in on sales.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) No. I fear I cannot think of any effective way.

(b) If the holding is left with the eldest boy there is no opening for the other brothers except perhaps day labour. Moreover it is difficult for the agriculturists to take a new business. Nor have they got capital. The usual way of dividing lands is not rational as each field is divided. Facilities by way of giving free services for measuring lands and valuing them may be useful to rational division. Also adjustments and exchanges may be encour-

aged. In Japan the Government have created a department for such adjustments.

QUESTION 10.—FERTILISERS.—(a), (b), (c) and (d) In the Bombay Presidency fish, oil-cake and sulphate of ammonia are freely used for sugarcane. To some extent oil-cake is recently used for cotton in Khandesh.

More liberal doses are not found economical.

The distribution of sulphate of ammonia was taken up in the Deccan in 1908. For sometime it was given free. In some cases it was sold at half cost and then at full cost. For many years it was stocked at Government depôts for sale. When it was given free or at half cost cultivators were required to maintain check plots and give results.

At the instance of the Bombay Department of Agriculture I have drawn a leaflet (No. 3 of 1923) which deals with this question. (A copy* accompanies.)

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) Number of working days. We have not yet investigated the problem. I have, however, taken up three average families (one in each district) and with the help of the bias agricultural school teachers I am getting weekly diaries to get some idea. Intensive study on large scale is necessary to get some idea of the working days. The number of working days will vary in each tract. My inference is that in a family of about five persons working days (on the farm) in the year will be about 180 for each person.

(c) For bee-keeping, sericulture and fish-culture most tracts of Bombay do not lend themselves well. Most farmers in the Deccan make their own baskets and ropes and many keep poultry. Poultry keeping should be improved, encouraged and helped.

(d) Yes.

(e) Yes. Power machinery, however, cannot afford any relief. The reason is that an operator on power machinery perhaps turns out as much as 5 to 10 times more produce. He thus displaces 5 to 10 craftsmen. Unless the purchasing power of the masses is greater or there is good market outside, power machinery, instead of giving relief, will increase unemployment. Most of our markets for yarn and cloth are closed as those countries which purchased our products have become manufacturers themselves.

I agreed to shifting industrial concerns to rural area because of the two evils the proposed one is less harmful.

(g) Propaganda amongst people to use hand-made things.

(h) To throw more responsibility on the village people, encourage village panchayets and give them part of the revenue collections provided they raise some funds locally.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) Please see my Note on Colonisation appended.

QUESTION 20.—MARKETING.—In my statement I have given under "distribution" and "marketing" my detailed views.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(b) Yes. Detailed inquiry of typical villages in each district may be conducted on the lines followed by Dr. Mann for Jategaon.

Less elaborate surveys should be attempted by the District Agricultural Overseers with the help of fieldmen appointed for this purpose. In this class of inquiry instead of attempting the costs and receipts of most individuals, only typical individuals may be selected and the costs and receipts worked out. Area under irrigation and different crops, also the total population, cattle, assessment, etc., may be worked out. To find out how much spare-time the inhabitants have diaries of the families selected may be maintained.

Comparison of such surveys will supply material for suggesting adjustment of population and for suggesting subsidiary industries. Such survey will supply data for comparing economic conditions of the different tracts.

APPENDIX.

A Note on Colonisation of new lands and some of my thoughts about Colonisation in India.

Probably one may doubt that as to how the question of acquiring new lands for agriculture and colonisation arises in an old country like India. In fact colonisation of India was accomplished long ago in the times of *Vedas* by the Aryans who poured in from the North-West long before America, Austria and Africa were colonised by the Europeans. A question may be raised as to how the problem of colonisation arises at this stage in India.

In a way there are plenty of grounds for such a question. In fact at this stage there are very few new countries and lands available for cultivation on the face of the earth. Most of the good parts of the world are colonised and settled. In fact in many countries there is excess of population. In India we have now 177 souls for every square mile. The population in France is still greater. In Germany the density of population is twice while in England and Belgium is three or four times as that of India. The economic conditions of the European countries are much better as compared with those of India. The industries, commerce in European countries are established and the rainfall assured and well distributed. Besides there is a good scope for the white people to send out excess population to other countries like Canada, America, South Africa, Australia, New Zealand and others.

Unlike the Aryans of Vedic times the people of India to-day have absolutely no scope and facilities to migrate to other countries. Under such circumstances the problem of utilizing to the best advantage all the available lands of the country itself, is very very important.

To think of the Bombay Presidency alone we find that even with a good and certain rainfall the inhabitants of the Konkan and the Mawal do not get enough even for their subsistence, because of the over population. Gujarat also is crowded for her land. In the East Deccan the holding of the farmer is larger, but the vagaries of rainfall, its ill-distribution coupled with uncertainty, do not allow the people there to eke out bare subsistence. Naturally therefore thousands of people have to run to the business centres of Bombay, Karachi, Ahmedabad, Sholapur, etc. Unending worries which harass the mill-hands at such centres can easily be imagined if we remember the recent labour conditions and strikes in the mills.

Besides this, the question of vital importance, which faces equally the rich and the poor as also the rural and the urban people is how to support such an enormous population of the country. Starvation has brought in an increased death-rate among children and the average age limit of people is shorter as compared with that of people in other countries.

Under these conditions, along with improvement in agriculture—

- (1) new land must be brought under cultivation,
- (2) the number of canals, wells, *bandharas*, etc., be increased,
- (3) spoiled salt lands in the canal areas and marshy tracts must be improved by draining and care taken to see that no further damage is caused to good lands,
- (4) vigorous attempts may be made to reclaim lands on the sea coast,
- (5) *tals* and embankments may be put in at suitable alignments and distances so that washing and scouring of land is reduced to minimum.

All these points may be carefully and thoroughly attended to with a view to increase the land-supply.

I will try here to deal only with the first point, namely, the possibility of bringing new lands under cultivation and the precaution to be taken in colonising such lands.

At present, in Gwalior, Indore and Dhar States of Malwa, in the Nizam's Dominions and in the Mysore States, there are vast tracts of lands which can be brought under plough. The Government of these States also seem to be anxious to get these lands colonised. When compared with the lands of the Deccan, the land in these tracts are certainly better and the rainfall there is better and more certain. In fact the Malwa lands should have been colonised long ago. But the land policy of the Malwa States is not or at least was not sufficiently attractive and so these tracts have not yet been well settled. The causes of the failure in colonisation have by now been appreciated by the Rulers of these States and they have been trying to improve and amend the land policies and to give more facilities to the colonisers; with the help of my friend Shrimant Khase Saheb Pawar, Home Member, Gwalior Government, I have got the Gwalior Durbar to organise a colonisation court on the show grounds at Poona which I am sure will interest the visitors of the show. There the visitors will be able to know as to where and how much land is available, the quality of these lands, the crops they can grow, the amount of rainfall and its distribution, the facilities given by the Durbar for colonisation and such other useful information in that connection. The visitors will be able to know the system of tenancies and land policies now adopted by Durbar. They will also get handbills giving the detailed information about Gwalior lands. We are expecting similar information from Dhar and Indore.

Lands in Sind.—It has also become possible now to get new land for cultivation even in British districts of the Bombay Presidency. The population in Sind is very sparse, so much so that the system of settlement and tenancy adopted there by the Government is quite different from that adopted in the rest of the Presidency. In Sind land is plentiful and the cultivator is allowed to retain a number of fields on his name and he is charged assessment only for those fields actually cultivated by him, retaining a lien on the remaining fields. Moreover lakhs of acres of nice land will be added to this land-supply on the Sukkur Barrage. People of the Presidency must now be very alert and active to their interests and try to capture all these lands in Sind. Indifference either on the parts of the leaders and of the cultivators or of the Bombay Government will mean the loss of valuable lands from the hands of the needy peasants of Bombay.

I am sure a number of financially better placed and hardy cultivators of the Presidency, like the shrewd *patidars* of Gujarat, the enterprising *malis* of Poona and roundabout, the clever Brahmins of the Konkan and the Jains and Lingayats of Karnatic will not hesitate to leave their present homes for better ones. The hardy but less enterprising Maratha cultivators of the Deccan may not like to go as far as Sind, yet many of them are going to Maratha States in Malwa.

Usual errors which have been and are being committed in colonisation.

(1) It cannot be said that the system of holding lands in many parts of India is very satisfactory. Except ryotwari most of the systems like *jamindari*, the *talukdari*, the *malguzari*, the *khoti*, etc., are not favourable to the actual tillers of the soil. The tiller has to pay heavy rent and yet he has very little interest in the land and thus he gets very little or no incentive and encouragement either to toil hard or to effect any permanent improvement. And yet in the face of all this, whole villages and large tracts of lands are even this day given in Malwa with the rights of *malguzari* which encourages absentee landlordism. It should never be forgotten that the systems of holding land and tenancies have a far reaching effect on the economic well-being of the country.

(2) Though the actual tillers of the soil do not get enough land for cultivation, blocks of thousands of acres of land are being sold, in the Nizam's Dominions, Gwalior, and if the rumours are right, large blocks of land may be sold on the Sukkur Barrage to capitalists, instead of giving small blocks,

capable of being well managed, to small cultivators. These people (*viz.*, capitalists) not being actual tillers of the soil will either divide their large blocks into pieces which they may in turn sell or rent and enjoy without putting their hand to the plough.

The evils of absentee landlordism are not imaginary; the troubles in Malabar, Konkan, Bengal and United Provinces are standing examples of such troubles. The old Governments gave out the rights of *malguzari*, *khoti*, etc., without thinking of the future effects. We may say that it was an experiment. It is proved that it is not a success and yet with all the troubles and economic disadvantages of these systems, if the Malwa States or any other Government dispose of lands as described above, it will mean that they sow the seed of troubles and dissatisfaction for the future generation.

(3) A good selection must be made of the farmers intended for colonisation. They must be actual tillers of the soil, they must know well the business of agriculture and they must also have a little capital.

(4) Instead of giving lands here and there, principle of close colonisation must be followed. Land sufficient only to maintain a family, should be the usual unit. There is no harm in giving more land if the man has got the means of managing it himself. People from different localities and of different manners and customs should be grouped separate so that each group may have a community life. People with different customs and manners and languages having no community life soon get tired. And this is what actually happened in Gwalior. The people from the Punjab, Marwar, Berar, Deccan and others who went to Gwalior not being separately grouped, got tired and many of them left. Scattered colonisation does not allow people to live in an organised body. Scattered colonisation does not allow people to arrange for water, roads, markets, religious institutes and schools for their children.

In an unorganised colonisation people are harassed by robbers, thieves and cattle lifters. From the history of Gwalior colonisation we find that no serious attention was paid to such important considerations and that is why many people got tired and left the lands while the Durbar has lost lot of money. There is another defect often noticed is, that the colonisers are not allowed to shoot wild animals that destroy their crops. The Durbar has realised the difficulties of the colonisers and I am told that they have learnt the value of organised colonisation and have allowed better facilities to protect the property and crops of the new settlers.

(5) Before attempting colonisation, a separate colonisation department or at least a separate officer is very necessary.

The following are the important points to be remembered :—

- (a) Close colonisation is essential.
- (b) Maximum amount of land to be given to each man must be fixed.
- (c) Detailed information about the soil, crops and cropping, rainfall and its distribution, etc., must be made available.
- (d) There must be somebody to help and advise the people and to remove their difficulties.
- (e) Their property must be protected from thieves.
- (f) They must be allowed to destroy wild animals.
- (g) Arrangement for the education of their children must be made. Roads, water and marketing facilities, religious institutions, temples, etc., must be provided for.

If all this done by the local Government for the people and with their help, and the colonies well arranged and organised from the very beginning the people will feel interest in the colonies and will be at home from the beginning.

Oral Evidence.

7868. *The Chairman* : Rao Bahadur Patil, you are Professor of Agricultural Economics and Acting Principal, Agricultural College, Poona?—Yes.

You have put in a very complete note for which the Commission is greatly obliged to you, especially having regard to the very strenuous time that you have been having in connection with the very successful Show at Poona.

7869. Do you wish to make a general statement before we pass to question and answer?—No.

7870. On page 509 you are concerned to recommend the study of agricultural costings generally?—Yes.

7871. Would that work fall to be done by you in the ordinary way?—I should recommend a separate section for agricultural economics, just as there are for agricultural chemistry, botany and so on. At present I am the only man there, with one assistant, and though I am trying to do something I have not sufficient staff.

7872. You would give the general direction, in any case?—Certainly.

7873. You are Professor of Agricultural Economics?—Yes, I am doing that work.

7874. Your idea is that you should give the direction, and have a bigger staff to carry out the work?—Yes.

7875. Where would you begin?—Marketing is more urgent than costings.

7876. You would begin by an analysis of the price structure?—If I have only one assistant I shall consider marketing as more urgent and tackle that first.

7877. Do you know of any complete systems of costings for agriculture or in agricultural marketing which have been carried out in this Presidency or anywhere else in India?—No.

7878. It is a virgin field?—Yes.

7879. Do you attach great importance to the examination and analysis of these matters?—I do.

7880. On page 511 you say : " Since in India rural interests predominate it seems necessary to create opinion in favour of rural life in all matters and to discourage luxuries, which are unnecessary and which we cannot afford to pay for. It is equally necessary to re-establish the old balance between the food and non-food crops." Taking the first point first, would you deprecate a rise in the standard of living?—I would welcome a rise, but if we cannot afford to maintain it, it is no use trying to do so. That applies to India as well as to other countries.

7881. The point I am concerned with is that obviously the luxury of to-day is the necessity of to-morrow, and if you harden opinion against all luxuries you are going to make an advance in the standard of living almost impossible. It is by adopting what appear to-day to be luxuries that the standard of living is raised?—I do not exactly agree. Probably the way of thinking in the West is different from that in the East. I should personally prefer a plainer life. If we had sufficient money it would be another thing, but when we are hard up it is no use going in for luxuries.

7882. If you are content to say you do not wish to see any rise in the standard of living which could not be maintained I do not wish to ask you any further questions on the point. Is that really your meaning?—Probably my note may sound rather pessimistic, but we are circumscribed by very difficult circumstances, especially in the Deccan, and for the masses it is no use going in for tea and sugar and things which are not necessary, when masses cannot get sufficient food.

7883. These things cut very deep. After all, if there is no ambition on the part of the cultivator to raise his standard of living and enjoy certain luxuries he does not now enjoy, you are not likely to get from him the energy and attention required for better cultivation. It is the desire for better things which makes people experiment and adventure is it not?—I quite agree, but we are spending what little we have got on certain things which are not necessary, and so do not get nourishing food.

7884. That is bad spending, is it not?—That is what I mean. If we can afford to buy luxuries that is quite all right.

7885. You say, "It is equally necessary to re-establish the old balance between the food and non-food crops." What exactly do you mean by that?—I will take one example. If for 60 years the proportion of food crops to non-food crops in Khandesh was 60/40, and if now it is reversed; the food crops are less than the others, so that we not only lose food but also fodder. I should therefore not go in for more non-food crops if possible.

7886. You do not think the tendency is for a slight increase in variety of diet?—Variety we have always had; there is probably less now than before, because we are specialising in certain crops.

7887. If you are going to have variety in diet, you must have increased purchasing power, unless you are prepared to confine your variety entirely to what you can grow on your holding. It needs an extension of purchasing power to buy food from other parts of India and of the world to get variety in diet?—I agree there is a good deal in that, but to my mind the purchasing power has not increased by specialisation.

7888. You do not think that by increasing the commercial at the expense of the food crops there has been any increase in the aggregate purchasing power?—I do not think so.

7889. Does what you say apply to irrigated land?—For irrigated land we will have of necessity to arrange special crops. It does not pay to grow *juar* or *bañri* on irrigated land.

7890. In a good many cases there has been an increase of sugarcane at the expense of food crops?—Farmers have to go in for that crop, because the rent is heavy. The water and everything else is costly, so they have to grow a costly crop.

7891. If you happen to have land on which you have to pay irrigation charges you are forced to grow a money crop?—Yes.

7892. And you deplore that?—Under the circumstances nothing better can be done, but in a dry tract I do not like the food crops to be sacrificed.

7893. I should have thought it was a matter of comparing the value of what you could grow on your holding to consume with the value of a crop grown for sale?—I agree that if a special crop brought more money into my pockets I should grow it and buy from outside.

7894. On page 514 you say: "In Japan the Government have created a department for such adjustments." That is, adjustments in sub-division, is it not?—They do not mind sub-division, but they insist on rational division. If I have three fields here and three brothers, each brother will have a piece of each field. In Japan they persuade the people to take one piece each, and then adjust matters according to value. Similarly, if the boundary between two pieces of land is crooked, they straighten it out by adjustment between the two owners.

7895. Consolidation proceeds step by step with sub-division and fragmentation is avoided?—Yes. I would like to avoid sub-division, but I do not see my way to advocate that.

7896. Do you know all about this Japanese adjustment department?—Yes. On my way back from America I spent about a month in Japan.

7897. Do you know whether the department in question attempts to effect consolidation of fragmented holdings where fragmentation has already taken

place?—Yes, that is attempted if both parties are agreeable, but they insist more on preventing future fragmentation.

7898. Are their rules against future fragmentation compulsory?—I am not sure.

7899. It is a very important point, in view of certain proposals which are in the air?—If I get any literature on that I will look into it.

7900. On the same page you discuss the number of days a cultivator and his family will work, and you fix on an average of 180 a year for each person. Of course, on the evidence already given (some of it at Poona) before this Commission, there is an immense disparity between district and district in that respect, is there not?—I agree, and I think I have mentioned that.

7901. I wanted to emphasise that, as it does not appear in the context here?—Yes.

7902. You are against the introduction of power machinery?—Yes, in the existing industries.

7903. It is a very big and difficult question?—I am against it, because it will displace man-power. I will try to justify my view if you like.

7904. The general wealth of the community must depend on the aggregate output of all the workers, must it not?—Yes.

7905. And a country is rich in proportion to the capacity of its citizens to produce?—If all the population is usefully employed it is all right, but power machinery is displacing a large number of people. It is no use creating unemployment, is it?

7906. But that period of adjustment has had to be faced and overcome in every country where labour-aiding machinery (as I prefer to call it) has been introduced, has it not?—Other countries, though they may not be hard pressed, are yet getting into difficulties. Shall we invite such difficulties here?

7907. They complain a good deal, but I do not think they complain as much of their difficulties as they would about the standard of living of a cultivator in an Indian village, if they had themselves to accept it! Turning to page 517, have you experience of colonisation?—Not first-hand experience, but I was and am very much interested in it. When I was in America for a year I studied two colonisation schemes, one in California and one in the State where I was reading, and on coming here I concluded we were very much congested in the Deccan, and I thought similar schemes could be applied here.

7908. Have you any particular land in your mind's eye?—Yes.

7909. Where?—Most of the Malwa States are not yet well settled. Lakhs of acres are still available in Gwalior and the Nizam's dominions, and in British territory I think there will be a lot of land on the new barrage.

7910. I should have thought the development of colonisation schemes initiated and administered by British India Government within the territories of Indian States would present considerable difficulty?—They are inviting people to come, and we are congested here.

7911. Has an experiment of this sort been attempted in Mysore, do you know?—In Gwalior they have attempted it, but owing to defects which I have pointed out they failed. Since they remedied those defects they are getting more agricultural labour.

7912. Do you think there is a shortage of agricultural labour in the Presidency?—I have explained that point. People think they are short of labour, but only because they cannot pay the market rate of wages. Apart from that there is no reason why there should be a shortage of agricultural labour in India.

7913. Do you think a statute protecting the cultivator against the adulteration of manures would be an advantage?—Yes.

7914. Do you think there is much adulteration of manures?—It has been going on for some years. We drew up a leaflet and distributed it, and since

then people purchase on guarantee and send samples to the Agricultural College.

7915. *Sir Henry Lawrence*: How did you bring this about?—I drew up a leaflet in 1922 and broadcasted it everywhere, and offered to analyse the stuff if sent to me, and I told them they should not purchase by bags but by weight and on guarantee.

7916. This leaflet checked the evil?—I think it has had its effect.

7917. *The Chairman*: One other question with regard to the introduction of labour-aiding machinery. If you look forward to a really substantial development of industry in India in, say, 100 years, which will attract large numbers of the rural population to a better standard of living in urban, industrialised areas, that would to some extent depopulate the rural areas unless there was concurrently an equivalent rise in the total population. Under those conditions, do you not envisage a time when the introduction of power machinery in agriculture would be an immense benefit?—My difficulty is this. One man with a piece of power machinery will displace 10 or 12. If 10 or 12 are displaced they have no work, and so no purchasing power. If we could reach good markets outside I would not complain about power machinery.

7918. What do you mean by good markets?—10 or 15 years ago our cloth was purchased by Japan, China and other countries. Those countries have now become manufacturing countries and we have lost those markets. When every country becomes a manufacturing country in turn, who is going to purchase?

7919. *Dr. Hyder*: Suppose that by making greater use of machinery in agriculture you can reduce the price of cotton, and by improved machinery in the cotton mill save still more labour, you say no one would be able to buy the stuff outside?—Yes.

7920. But do you not think the cost would go down, and you would be able to place the manufactured article in China, Japan and other places at a lower price and so find a market?—I do not think so. It is like people living by taking in each other's washing. If every country becomes a manufacturing country no one will be able to buy.

7921. *Sir James MacKenna*: You said there was no shortage of labour, but that the cultivator cannot employ it because the rate of wages is high?—Yes.

7922. Why is it high?—Because in the urban areas and non-rural industries they can afford to pay the market wages, but in a marginal industry like agriculture the cultivator feels if he pays the market rate he will be giving the labourer more than he gets himself.

7923. So agricultural labour is swallowed up by industrialism?—Not quite swallowed.

7924. Very nearly?—People employed in urban industries get more.

7925. That being so, there is a shortage of labour available for agriculture. Is not that an argument for the introduction of machinery to take the place of labour? It will not in fact be replacing it?—Urban industry has brought about our shortage of agricultural labour.

7926. What was your training before you became Professor of Economics here?—I am from necessity Professor of Agricultural Economics. I am more of an agriculturist, but there was a gap here. I first farmed myself for some years, and then at the age of 29 I became a graduate. I was first Superintendent of a farm and then Lecturer, and then after six years I thought agriculture was not paying, and that we had not much to teach to our agriculturists here. I therefore took a trip to Europe and spent a year seeing most of the European countries. After coming back I continued my business as Agricultural Inspector and acted as Professor of Agriculture for a year, and then again took leave. I was anxious about the business side of agriculture. I was already in the higher service, so there was no incentive for me to get a higher job. I spent 18 months in America and took a trip round the world.

7927. You took your degree of M.Sc. in Agricultural Economics in America?—Yes.

7928. At what College?—Wisconsin. Then I became a Deputy Director again, but since there was a vacancy for someone to teach agricultural economics and someone had to make a beginning, I did so.

7929. *Professor Gangulee*: How long have you been teaching agricultural economics?—18 months.

7930. With the help of the text-books, and data you have collected yourself?—I am collecting data. I do not simply depend on books.

7931. What do you mean by "simply depend on books"? Have you sufficient data for your teaching rural economics?—It is difficult to get data in a day, but I have the experience of 20 years at my back.

7932. For instance, when studying marketing of farm produce do you take your students to the markets?—Yes, and more than that. I not only take them to see how, for instance, *gul* marketing is carried on, but how a sale society should be formed for it and how they work.

7933. Your M.Sc. degree was in agricultural economics from the University of Wisconsin?—Yes.

7934. Have you studied most of the standard books on agricultural economics?—I think so. Before going to America I spent two years in preparatory work.

7935. You say the cultivator buys luxuries at the expense of necessary food. Could you define what you mean by "utility"?—That which gives you satisfaction.

7936. "Marginal utility"?—It is more like a University examination here!

7937. I will not take you into economic questions, but I want to deal with the human aspect of the question. Would you buy luxuries at the expense of necessary food?—They are doing it. Poor women bring fuel here for sale, which will fetch about three annas, yet the woman will stop to purchase tea for half anna. I think it is at the expense of food.

7938. You have travelled a lot, have you not?—Yes.

7939. You have studied the agricultural development of other countries as well?—Yes.

7940. Do you recognise that the agricultural industry is passing into a stage known as commercialisation?—Yes.

7941. From its self-sufficient basis it is passing to another basis?—Yes.

7942. And you say the balance between food and non-food crops is disturbed?—Yes.

7943. Do you not think that is simply a phenomenon of modern times?—I quite agree we cannot stop the times, but if possible we should not go in for non-food crops when more food crops are required in this country.

7944. You cannot isolate yourself from these forces?—I agree, but is it not better to give one's own honest view?

7945. *Mr. Calvert*: There is an examination in agricultural economics, is there?—Yes.

7946. Do you set the paper?—In Bombay University, yes.

7947. Have you a co-examiner also?—Yes.

7948. Who is he?—*Mr. Gokhale* was my co-examiner.

7949. You say the Indian farmer has shown keenness to adopt improvements. What proportion of the acreage in Bombay has been covered by improvements?—When I was district officer, good improvements brought to the notice of the farmer were adopted by him. In 1908, I first took up the distribution of ammonium sulphate. For one year we gave it to the farmers free, and for the next two years at half cost. Immediately there arose a demand, and we had to have a large number of depôts to satisfy them.

Thousands of tons are now used. In the same way, in 1906 there were perhaps 10 iron ploughs in each district; now we can count them by thousands. I think, therefore, that whenever a good thing has been offered to the farmer he has readily responded.

7950. Have you any idea what proportion of the total cultivated area has now come under the influence of the department?—I could not say.

7951. About 4 per cent?—I think it may be up to 10 per cent. It is difficult to say, because we may not have gone very deeply into the interior, which has not got good communications.

7952. You say the land available for cultivation per family is insufficient?—Yes.

7953. Insufficient for what?—Insufficient to maintain the family.

7954. That means you have too many cultivators for the land?—Yes.

7955. Is that because there is no alternative employment?—There is no scope outside agriculture here.

7956. You have practically got the conditions of a sweated industry?—Yes; we have got to stagnant stage.

7957. People are cultivating not for profit or return, but for food?—Yes, just to maintain themselves.

7958. You say the amount of capital available is small?—Yes.

7959. Have you ever made any estimate of the amount of rural debt in Bombay?—I have not made that estimate, but when we go into the talukas to see the work of the co-operative societies we find that the debt is not much lighter now; there is quite a large burden of debt upon the people.

7960. The gross total may be quite large?—It may be.

7961. Fifty or 60 crores?—I have no idea.

7962. The Punjab estimate is 60 or 70 crores; would you call that small?—I cannot say whether it is less or more in this Presidency. I am just beginning my study in it.

7963. How do you reconcile the existence of a heavy debt with the amount of capital being small?—When a co-operative society is to be organised, the capital is not forthcoming. It is production on the margin; the people are not making profits and naturally capital cannot accumulate.

7964. *Mr. Kamat*: You said there is plenty of labour?—Yes.

7965. And that power machinery will create unemployment by displacing men?—Yes.

7966. You are in favour of sending out men to Indian States for colonisation?—Yes.

7967. You said high wages are not due to scarcity of labour?—No.

7968. The high wages have nothing to do with scarcity of labour?—No.

7969. Have you got any data as to the shortage of labour?—I do not admit that there is a shortage of labour.

7970. Is that based on any investigations or any figures which you have collected?—I have a farm myself; when I cannot make any profit I still have to pay wages; I cannot afford it; at market rates I find it very difficult to employ labour. It is in that sense that I say labour is short.

7971. I am asking you because Government have made certain very close investigations into agricultural wages, and the conclusion has been reached, based on facts and figures, that in the decade from 1911 to 1921, 14 per cent of the people who were engaged in agriculture before had left that industry, that so far as agricultural field labour was concerned, there was a deficit of 37 per cent as compared with 1911. So that the number of field labourers was reduced, and yet you say there is no shortage of labour?—When the village handicrafts decayed the workers fell back on agriculture. When the railway and public works contracts were being carried out, no doubt for a

time there must have been a drain on the agricultural labour; but on the whole there is no reason why there should be a shortage of agricultural labour.

7972. And yet we were told that people were giving up agriculture owing to its uneconomic character and the poverty amongst agriculturists?—I did not say so; I admit that it does not pay, but they cannot give it up.

7973. Then, with regard to the relation of commercial crops to food crops, I definitely asked Mr. Jenkins yesterday whether in Khandesh the stage had been reached in which there was a serious shortage of food crops, and he replied that that was not so at all. You maintain there is a disproportionate increase in commercial crops?—I do not say that is so in Khandesh, because that is a rich tract, but it is true with regard to the whole of India if you calculate how much grain is produced as compared with the needs of the population. In my book I think I have said that with regard to this Presidency.

7974. *Sir Ganga Ram*: What about the other Provinces?—I do not profess to know the whole of India.

7975. *Mr. Kamat*: I asked Dr. Mann the same question with regard to the Bombay Presidency, and I think he also replied that there was no serious cause for apprehension as to the decrease of food crops. Do you hold the same view?—No, I do not. Do we not bring a loc of rice and *juar* from other tracts?

7976. *Dewan Bahadur Malji*: In your written evidence you refer to your activities at Wadgaon in the Kolhapur State. Is that in connection with some lands owned by you?—Not owned by me, no.

7977. It is merely financed by you?—Yes.

7978. How does the partnership come in?—The sugarcane is grown on lift water; the water is raised on five shifts. We have to combine in partnership to grow sugarcane.

7979. Do you mean that you are a partner?—Yes, I am one of the partners.

7980. Does it leave a sufficient margin of profits?—No, it does not.

7981. Has it paid so far?—No.

7982. Have you studied the results carefully?—Yes, but we have to do something as farmers.

7983. Have you advised the cultivators?—I do not see my way to advising them; they are very good cultivators; they are very economical and very hard-working.

7984. Perhaps you have nothing to teach them? If this state of things continues, what of the future?—The future is bad.

7985. The future prospect is that they will have to part with their property?—Slowly.

7986. And clear the debts in that way?—I do not know; it may not be the same everywhere in the Presidency.

7987. Are you not sufficiently optimistic to hope that if you resort to extensive and intensive cultivation you may be able to make it a business proposition?—As I have said, here and there we have improvements to offer and the cultivator can no doubt pick up something from us. On the whole, in certain parts there is great difficulty, while in other parts there are possibilities of improvement.

7988. Am I to take it then that most of your observations apply only to the Decan?—Yes, I think so.

7989. With regard to indebtedness, you said that the agriculturists to whom the co-operative societies advanced money on loan were not able to return the money?—Yes.

7990. And, therefore, by way of insurance, you insist upon their requirements being carefully rationed, to use your own language?—Yes.

7991. You mean that their requirements must be carefully checked and no more than is necessary should be advanced on loan?—Yes. I think the rate of interest should be low if possible.

7992. The present rate does not enable them to make agriculture a paying proposition, you think?—No, it does not.

7993. *Sir Ganga Ram*: You are a Professor of Agriculture?—Yes, I was for sometime.

7994. What are you now?—I am a Professor of Agricultural Economics.

7995. You are very fond of agriculture. Do you not know that oil-seeds replenish the soil?—I know leguminous crops do.

7996. Then why do you advocate food crops?—But a large part of the oil-seed crops is not crushed here.

7997. If you grow castor you take the fruit and plough in the stalks; would not that replenish the soil?—Not much.

7998. Then what does replenish the soil?—Certain leguminous crops.

7999. Are not all food crops leguminous crops?—Not all; castor, for instance, is not a leguminous crop.

8000. But you can plough in the stalks?—The castor stalk is wood.

8001. In reply to the Chairman you said you are not in favour of labour-saving machinery. Did you mean all machinery?—I am not in favour of machinery that will displace man-power. Of course, we cannot stop it, I have admitted that.

8002. If there were no machinery for ginning, how much cotton do you suppose would be grown in the Presidency?—Less cotton.

8003. There would not be a hundredth part?—What would it matter?

8004. I will prove to you from your book that you are not producing sufficient food crops to feed your population and that you are actually living on the price of your cotton?—I agree to some extent. You pointed out in a letter that if the grain grown in this Presidency is divided by the population there is not sufficient to feed the people, according to you, and yet we have exported cotton and produced unemployment here.

8005. But that cotton would never have been produced if it had not been for the ginning machinery. Are you not buying food now? Is there not an import of food into the Bombay Presidency?—There is.

8006. Then what would be your purchasing power if you did not obtain money by the sale of cotton?—Then we should not have grown so much cotton; we should have grown grain.

8007. But your grain will not grow unless you replenish the lost properties of the soil, and that can only be done by growing leguminous crops?—All the oil-seeds are not leguminous.

8008. But those that are not have other properties of replenishing the soil. You say on page 22 of your book that you are producing sufficient food for the whole population?—I did not say that. I have only published in a little book information for the public about the possible allotment of grain; that is all.

8009. *Dr. Hyder*: You say the Indian peasant works hard where nature responds?—He works hard where nature responds.

8010. And you say in your evidence that where nature is made to respond he becomes lazy, as, for instance, on the canals?—Yes, on the canals he is not found hard-working.

8011. So that apparently for the moral welfare of the nation it would be a good thing to blow up all these magnificent dams?—No, I did not say that. I have advocated irrigation works.

8012. But you say that the Indian peasant works hard where nature does not respond, but becomes lazy where nature is made to respond. After all, a canal is merely a conquest of nature?—Where nature does not respond the peasant becomes fatalistic. I am an agriculturist and I agree you can conquer nature in a sense.

8013. In the Deccan you have overcome the shortage of rain by constructing those magnificent dams—Yes.

8014. And you grow crops?—Yes.

8015. But you say in your evidence that where you have irrigation by means of those canals the cultivator becomes lazy and does not want to produce more?—No, I think you are confusing two things. There are two statements, where nature responds, as in the Konkan, he works very hard; in the East Deccan where nature does not respond, the man works for one or two years, but then, finding that nature does not respond, he says, "What is the use of working hard; last year I worked at a loss; let nature do what she likes"; he becomes a fatalist. The third proposition I have stated is that on the canals the people work hard, but some of them sometimes are lazy. That is because there the cultivator thinks he is a big man, he is well pleased, and so he employs labour.

8016. So that you do not think it would be conducive to the moral health of the nation to blow up these magnificent dams into the air?—No. If you read my note on colonisation you will find I have emphasised that point.

8017. *Sir Ganga Ram*: In your book *The Crops of the Bombay Presidency*, on page 22, you say, "If we take the Bombay Presidency as a whole, without taking any account of the special conditions of each district, we find that taking cereals and pulses alone, which form almost the whole of the food of the population, it will be seen that the Province produces enough food to supply about 713 lbs. a year per head, or about 2 lbs. of grain per day for each member of the community." Are you quite sure of these figures?—I think they are right because I got those figures from the Government records.

8018. When was this book published?—In 1922.

8019. Then these figures can be taken as being absolutely correct?—For the year 1913-14, I have taken a normal year.

8020. That is with regard to food for human beings. What about the food you give to the cattle?—That also I have worked out.

8021. I do not find it in this book?—It is in some other chapter, if you will allow me to find it for you.

8022. I work it out that you require 3·31 lbs. per head of food for the population and for the cattle which must be kept. If that figure is correct, there is a deficiency of 33½ per cent. I can also prove the correctness of my figure by the fact that you import 33½ per cent. of the food you consume; you sell your cotton and with the money realised in that way you buy 33½ per cent of your food from other Provinces?—I do not claim to have stated anything new; I merely worked out official figures.

8023. You underestimate the value to you of the cotton crop which I say has become a necessity to you. In other parts, in my own Province, for instance, cotton is never touched by the tenants; they produce their own food; but I can prove to you from the imports that you buy 33½ per cent of your food by selling cotton?—That is why I say, "Do not grow more cotton; grow more food."

If you do not grow cotton your people will starve.

8024. *Sir Chunilal Mehta*: On page 509 of your written evidence you say, "Except in one case where the man has purchased additional land all others either lost part of their land or have had their debts increased." Why did that one man succeed?—He has two or three brothers. Agricultural wages are not low. Where a man has a family the members of which are all working hard, he can succeed on good land. On that land nature responds.

(The witness withdrew.)

Mr. B. S. PATEL, N.D.D., N.D.A., C.D.A.D., Professor of Agriculture, Agricultural College, Poona.

Replies to the Questionnaires.

QUESTION 1.—RESEARCH.—(a) Research workers should be given travelling facilities for seeing and studying on spot the research work being done on similar problems in different Provinces of India and should be also required to go abroad to suitable research centres on study leave once or twice during first 15 years of their service so as to keep themselves up-to-date on the methods of work. I think money spent in this would be well spent and may broaden the outlook of the workers who are otherwise likely to be self-satisfied in their own little sphere of work.

The research work as well as the administration work in the Presidency has developed so much that it would be better if divisions of work may be made by leaving the administration work to the Director and research work to a suitable Joint Director. Research work will then receive due attention and help from such a Director.

Attempts may be made to raise a special research fund from the public as it is done in cases of hospitals. If the State would come forward to contribute an equal amount within a certain limit it may be possible to raise good permanent fund from which various researches can be financed.

Such a fund may be controlled by a suitable provincial board of trustees representing the Government and the Public.

(b) The central institute like the College of Agriculture should have provision of studying the factors of crop production as a whole. If we know quantitatively the effect of various factors on crop production, we can work for getting the best result possible under given soil and climatic conditions. The question of studying the digestibility of local feeds by various breeds of cattle in Western India, their assimilation by them for production of milk, and other animal products and for growth are left untouched. Their study may throw good light on the subject of economic management of work and milch cattle.

QUESTION 2.—AGRICULTURAL EDUCATION.—Agriculture being the mainstay and profession of 80 per cent of population of India the education given in the schools (Primary, Middle and High schools) should be such as will create sympathy and taste for agricultural pursuits and will acquaint the youth of the country with the theory and practice of agriculture. At present some 49 primary schools are teaching elementary agriculture in higher classes. These schools are known as agricultural bias schools.

Then there are six special middle schools of agriculture where the students get vocational training in agriculture. Thirdly, there is the College of Agriculture at Poona for higher education.

But these institutions are not enough to spread general knowledge amongst the masses and therefore I would suggest the following scheme for improving the education of the country.

(a) *Elementary School.*—The general atmosphere even of primary schools should be agricultural, i.e., the school equipment should consist of pots or plots for living plants to be grown by the staff and the pupils in the lower classes should be made to observe the different processes of plant growth in the school compound, besides they should be taken out at least once a week to the surrounding fields to acquaint them with the agricultural environment. This will form a part of the practical course of nature study in the lower primary classes.

For the upper primary classes or middle schools the elementary knowledge of agriculture, both theoretical and practical, should be imparted corresponding with the agricultural bias courses given in some selected primary schools

in the Bombay Presidency. For this purpose a plot of an acre or two with the necessary equipment should be provided wherein the work of growing crops from the beginning to the end should be done by the teachers and the students.

(b) *Secondary Schools or High Schools.*—The teaching of agriculture, theoretical and practical, should be continued in the first two classes of the High School by devoting at least two hours a week.

In the last two classes of the High School the subject of Agriculture should be added in the groups of optional subjects assigned to Science courses for the school leaving certificate of the Bombay University so that the students wishing to have advanced knowledge of agriculture may have the choice of this group. Farm of 10 to 15 acres should be attached to all the rural High Schools for teaching theory and practice of agriculture. Irrigation facilities may be of advantage.

The students selecting the agricultural group in the last two classes of the High School shall be eligible for admission into the Agricultural College.

To make the practical course in the Primary, Middle and Secondary Schools really efficient the schools should work six hours a day, four of which should be devoted to mental work such as lectures and laboratory exercises and two hours a day should be solely set apart for manual work including Agriculture, Carpentry, Spinning, Weaving, etc.

(c) *Collegiate or Higher education.*—As the subject of Agriculture has been proposed to be introduced in the curricula of the primary, middle and high schools, the college course now given shall have to be readjusted and a three years' course will suit the purpose.

I would add the subject of Rural Economics to the present course. As the students come direct from the High School to the College of Agriculture, English may have to be taught in the first year.

Administration of the educational system.—I would suggest that there ought to be a Board of Education to settle the course of various schools and such a board should have an adequate representation from the Agricultural Department.

Secondly, there ought to be proper provision for training the teachers of primary schools as the success of the course depends upon the type of the teacher available.

I would suggest that the Loni type of schools should be converted into training schools to provide teachers of agriculture in primary schools. During the transition period three-year trained teachers should be trained in agriculture for a year and examined and only successful candidates should be appointed as teachers in agriculture. These Loni type schools will function as training schools until the first batch of students come out with the school leaving certificates. These certificate holders then may be employed as teachers in primary and middle schools and should be trained in pedagogy for a year in the present training colleges.

Technical training in agriculture.—There ought to be continuation evening classes in agriculture for those who take to farming after leaving the primary school.

The training schools like Loni will not be required and may be converted into vocational schools giving two years' courses in agriculture and secondary occupations for those who leave the middle schools or those who have attended evening agricultural classes.

The students leaving high school and wishing to follow farming may get a year's vocational course in agriculture at the college as it is given at present.

The teaching in agriculture and nature study at the high schools, training schools and training colleges should be recruited from agricultural graduates. In selecting the teachers for all schools preference should be given to agricultural classes provided they are otherwise equally qualified.

I have suggested the agricultural course of high schools and college for the transitory period but I would suggest that our aim should be to have special agricultural high schools wherein three-fourths of the time may be devoted to agriculture, theoretical and practical, and the college course may then be readjusted.

Adult Education.—(a) Visual instructions to the illiterate people can be given through magic lanterns, cinemas, stereoscopes, popular demonstrations of simple scientific experiments on various subjects concerning the welfare of the population. This should form a part of the duty of the primary school teachers and members of various technical departments. Night schools should also be organised.

(b) For others over and above the method of visual instructions libraries and reading rooms, reading circles and continuation evening classes should be organised.

Finance.—Primary education up to the age of 14 should be compulsory and free. This may be provided by the *gramya* panchayets or local boards subsidised liberally by the State. Cost of other institutions may be met by raising a rural development loan to be liquidated over a long period by any small tax that may be conveniently put on the export trade. This development fund should be used as a grant to the local organisation or educational societies for educational work. This is the only way of getting the best result with the least expenses.

Careers of the Agricultural Students.—Most of the students seek Government service. We cannot expect any other result when we find that the education given in primary and secondary schools is entirely non-agricultural, besides it is such that it creates aversion to any sort of manual work and particularly agricultural work.

Secondly, the school and college educations are so costly and the standard of living acquired at these institutions is so high that it is impossible for an educated man to earn a living from a majority of the holdings prevailing in the Bombay Presidency.

The only scope for such an educated man for following farming is to procure a big-sized farm and a required capital at the reasonable rate; none of these are possessed by a majority of the college graduates. Even if any graduate possessed a large area and capital the difference between the income earned by farming one's own land and the rental income by renting out the land to the tenant is so small that the landowner would not consider it worthwhile to farm his own land.

A good Khandesh farmer of Pachora taluka employing hired labour and farming on his own land for the last 10 years has had the following results:—

Area cultivated was 85 acres.

Area for grazing was 15 acres.

For 10 years from 1915-16 to 1925-26 excluding one year the total farm expenditure amounted to Rs. 24,318 and the total farm receipts during that period was Rs. 33,593, leaving a net return of Rs. 9,275 over 85 acres which averages at Rs. 11 per acre per year. If this land was rented out the farmer could have earned more than this.

Another farmer of Ankleshwar in Broach district, employing hired labour and farming part of the land of his own and part of the land on lease for a period of eight years has had the following results:—

Average area cultivated was 48 acres out of which the average area leased was 12 acres, the rest being his own land.

For eight years from 1917-18 to 1925-26 excluding one year when the land was flooded by the river, the total farm expenditure amounted to Rs. 17,292 and the total receipt of the farm was Rs. 27,059, thus giving a net return of Rs. 25 per acre per year.

During the flood year the expense was Rs. 2,530 and the receipts amounted to Rs. 1,643 and if we calculated the average net return over nine years we find the net return per acre per year is Rs. 23.

The lease charges of the land actually paid were Rs. 20 per acre. In this second case the land is situated in a cotton tract and though the season was irregular and the yield varied widely from year to year the receipts always covered expenditure except in a flood year. This case shows very favourable situation. Yet the owner of the land would realise a difference of Rs. 3 per acre by farming his own land instead of renting it out. Such small remuneration for management is not attractive and at any rate cannot give a living to a graduate who has to hire or purchase his land and has to raise capital.

(This uneconomic condition of farming is really the chief cause of farming being not attractive to college graduates or even to high school men unless they are content with a very low standard of living or working as peasants.)

This means that most of the agricultural graduates can only be expected to be leaders in the field of public service or as farmers on a large scale or as farm managers on large estates by further practical training in business farming on some large business farms run by the State or private men.

QUESTION 5.—FINANCE.—(a) The cultivators cannot afford to pay higher interest than 4 or 5 per cent on their outlay and therefore steps should be taken to provide capital to the co-operative banks or land mortgage banks loaning money to the cultivators at a rate that will enable them to loan it to the farmer at not more than 5 per cent interest.

The Postal Savings Banks and the Imperial Bank of India receive large amount of money as deposit at a rate of 3 to 3½ per cent and as these departments are Government or semi-Government, they should be made to set apart at least 50 per cent of such deposits for loaning out to the farmers' banks at ½ per cent extra rate. If I mistake not State Banks are doing this in France. However, I would provide greater control over the expenditure of the loans given to the farmers so that no money may be invested in non-productive items.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) *Main causes of borrowing.*—Small holdings which give the farmer work only for a part of the year and do not give him enough income to supply his minimum standard of living for a year, besides leaving him nothing for a bad year which is very frequent.

The general and technical education of the farmer is so low that he is inefficient in his work, unorganised, injudicious in his personal and social expenses besides he has not been trained to be industrious nor any steps are taken to provide him with a subsidiary occupation to supplement his income or to provide his needs by working in spare times.

The causes given in (a) (i) are responsible for non-payment of his debt.

Besides, the interest charges he has to pay for his capital are too high for the profession to bear and thus his debt accumulates.

(b) I would suggest that a good, general and technical education that will make him more efficient as a farmer, more industrious to work in his spare time on subsidiary occupation and will make him more judicious in his expenditure, will help him a good deal later on.

But to start with to reduce the existing debt the application of the Usurious Loans Act would be necessary, side by side facilities of long-term cheap credit may be provided for redemption of mortgages.

(c) I would suggest no other restriction on the credit excepting that of limiting the loan for productive purposes.

QUESTION 12.—CULTIVATION.—(i) On the college farm we have worked out a system of growing crops under irrigation called "broad ridge method" in which irrigation is given in channels five feet apart and water is allowed to percolate through the raised broad ridge between two channels.

This system keeps the soil in good physical condition for the development of the underground parts of the plant and we obtained the following results :—

	Green turmeric in lbs. per acre.	
	1925-1926.	1924-1925.
(a) Broad ridge method	33,552	24,000
(b) Ridge and furrow method	26,380	21,000
(c) Bed method	18,824	14,000

The increase of yield in broad ridge method over the Satara ridge and furrow method was 14 to 27 per cent and the increase of yield in broad ridge method over the bed method which is followed in some places in Deccan is 71 to 77 per cent. This shows the possibilities of improvement in irrigated crops in Deccan are very great. The extra expense involved in the method is comparatively small and the net extra return per acre in (a) method is Rs. 70 to Rs. 110 over (b) method and Rs. 260 over (c) method.

QUESTION 14.—IMPLEMENTS.—If it is possible I would suggest that we should induce some of the best foreign manufacturers as International Harvesting Company and others to establish their factories in India so that they would be able to study the requirements of India and modify the implements to suit our conditions.

QUESTION 16.—ANIMAL HUSBANDRY.—(a) (i) At present the general policy of cattle-breeding is to maintain different kinds of existing breeds on a farm in the locality and select from them according to the requirements of the public. Excepting on one farm at Surat and on Gorakshan farm at Kandvalli there is no material good enough to produce dual purpose animals (for milk and work). The big herd maintained at Chharodi for Kankrej cattle has very poor milk record and unless best animals for dual purposes available in the district are purchased, for sometime there will be very little chance of getting dual purpose breeds.

Selection and elimination can then be made after studying the record for sufficient period.

The question of training the professional breeders in farming and cattle-breeding may be taken up with a view to settle them up on land and utilise their traditional experience for the improvement of breeds. These people would not take to farming and are depending upon grazing areas practically free and unless their children are encouraged to go to schools teaching agriculture I am afraid the race will have to be extinct or live as pest on farmers.

The work of cattle improvement is slow but most important and good deal more of intensive work is demanded. The Presidency should be divided into two divisions and two livestock officers should be on the intensive work in breeding, each having about two or three breeding farms under his charge so that he can do more intensive work on cattle-breeding like the work of breeding on crops.

Buffalo, the most important milch animal, has been left to itself and the system of city milk supply is slowly but surely sending the selected animals to slaughter houses particularly in Bombay and a farm for improving breeds of buffalo should be started without further delay. I understand some believe in neglecting buffalo as milk animal simply because we would like to have a dual purpose cow but if we are to go on at the present rate of improvement of cows it will take 100 years or more before we can get good dual purpose cows. The best way is to improve the buffalo as well as the cow and allow them to compete with one another until we get the cow which is so economical that she drives out the buffalo.

We need buffalo for milk and butter and *ghi* for years yet. Besides suggestion given in the note on the co-operative development of the dairy industry I would suggest that a dairy school should be started in northern part of the Bombay Presidency in the heart of dairy tract where vocational course in animal husbandry and dairying should be given. This may be attached to a cattle farm for improving milch buffalo of the tract.

If cattle of higher milking capacity be bred to make them economic producers there will be no difficulty in inducing the farmer to grow fodder crops instead of cash crops.

(a) (ii) *Possibilities of developing co-operative dairying.*—Before we consider this let us see the importance of dairy industry in the Bombay Presidency.

Milch buffalo is our chief dairy animal, cow playing a minor part as dairy animal. So the study of the number and distribution of milch buffaloes in some centres of the Bombay Presidency would be useful.

Name of district.	Number of milch buffalo.	Number of cultivated acres per milch buffalo.
Kaira	113,000	7.3
Ahmedabad	100,000	14.0
Surat	54,000	14.0
Thana	32,400	18.0
Bombay Suburban area	5,500	6.0
East Khandesh	75,000	26.5
Satara	88,000	22.5
Belgaum	89,000	20.0
Dharwar	83,000	26.5
Larkana	77,000	10.5
Hyderabad	76,000	8.5
Karachi	56,000	7.3

This shows that in point of number and distribution Kaira and Ahmedabad are most important dairy centres. Other important centres are Surat district, Bombay Suburban area, Karachi, Hyderabad and Larkana.

Some of these centres compare quite favourably with Denmark which has one cow for every six acres. The concentration of trade in Kaira, Ahmedabad, Bombay Suburb and Karachi is well suited for organisation and management of the industry on co-operative lines.

Kaira and Ahmedabad have a good butter trade and cities like Bombay, Ahmedabad, Karachi, Surat, Poona, etc., have important trade in city milk supply.

Value of the dairy produce.—Value may be estimated by knowing the average production per animal and the market value of the product.

Gujarat and Sind cattle may be taken to produce about 2,000 lbs. of milk per head per year. Deccan and Karnatak may be taken to average about 1,000 lbs. of milk per head per year. The total number of milch cattle in Gujarat and Sind centres including Bombay and Thana comes to 5,10,000 and for Deccan and Karnatak to 3,30,000.

Valuing milk at nine pies per pound on an average (this value is realised for *ghi* and butter but milk sold to cities realises double the value) 5,10,000 buffaloes will produce at Rs. 94 per buffalo 4·8 crores worth of milk and 3,30,000 buffaloes will produce at Rs. 47 per buffalo 1½ crores worth of milk, total coming to more than Rs. 7 crores which is not a negligible figure.

If we estimate the value of the milk trade estimated in 1913 by a special committee for six cities of the Bombay Presidency, the value of milk per day comes to Rs. 40,000 at a rate of 10 lbs. per rupee. This amounts to Rs. 1 crore 46 lakhs per year. If other cities are included, the value will be easily two crores a year. Thus the cities are the important centres of milk trade.

Now, as far as butter trade of Northern Gujarat is concerned, I find that as many as 500 cans of cream, equivalent to 12,500 lbs. of butter per day are exported to Bombay, Ahmedabad and other cities. The farmer realises about 10 annas per pound of butter, and valuing at that the total value comes to Rs. 7,800 for butter and Rs. 200 for casein. This will amount to Rs. 27 lakhs per year. So Northern Gujarat is an important centre for butter trade.

Our work lies near cities and in Northern Gujarat.

Let us now see the quality, supply and prices of dairy produce.

Dairy produce consists of 3 main products:—

1. Milk for our local cities and towns.
2. Butter for export to distant places in India and out of India.
3. *Ghi* for local towns and cities and export to different cities of India.

Milk-supply.—(a) A supply of milk in our cities comes to 13 to 27 lbs. per head of population as against ½ to 1½ lbs. in other civilised countries.

(b) The price of milk in our cities varies from 2 annas a pound to 4 annas a pound for pure milk as against 2 to 3 annas per pound in England and America though the spending capacity of our people is far too low compared with people of those countries.

(c) Milk-supply is mostly adulterated in big cities and insanitary.

Most of the milk in cities is produced under costly artificial conditions. The *Gowli* producer is under the clutches of the moneylender and unless he retails he does not get a fair price for his product. His cattle too are unprofitable as a result of no organisation for improving cattle amongst the farmers of up-country who supply these cattle. So there is plenty of scope for organising the *Gowli* to help him with cheap money, better purchasing of his requirements and better sale of his produce. Such work is done in Nagpur with advantage to the producer and the consumer.

Some cities have a large proportion of their milk drawn from the farmers of adjoining villages. These producers too are under the clutches of the milk dealers who advance money to them. The producers are ignorant and do not study the requirements of the market. There is good scope for organising these producers for supplying the milk to the city as is done very successfully near Calcutta. It will not be out of place to give some idea of this successful organisation.

In 1917 only one society was formed in a village near Calcutta supplying 20 seers of milk. In 1925 there were 64 village societies supplying 100 maunds of milk a day.

The first society made only Rs. 3 as profit. The present union of societies makes Rs. 40,000 as annual profit.

The first society borrowed Rs. 330 for its use; later on the societies borrowed Rs. 50,000 and now they have capital of their own of Rs. 75,000. This is very good progress in 8 years and shows the possibilities elsewhere. These societies paid Re. 1 a maund more than the ordinary rate in village and sold pure milk in the city at a cheaper rate than that by *Gowlics*, thus benefiting the producer as well as the consumer.

This has a stimulated milk production, cattle improvement and keeping of better cattle. Milking is supervised by the societies to produce pure milk.

Near Agra milk produced from villagers' cows has been collected at a central dairy in the village and has been delivered in the city market of Agra and Hathras which are 8 and 6 miles distant respectively from the villages producing the milk. This scheme has proved remunerative to the middlemen and has been in operation for more than 3 years and supplies 12 maunds of milk daily to the Agra market. So there is no reason why co-operative organisation should not succeed on similar lines.

If the milk-supply of villages round about cities on the railway line leading to big cities could be organised on co-operative lines, it would offer a great stimulus to increased production as the producers would realise a good deal more than they do at present for their milk; besides the organisation if properly directed could be the means to improve cattle and increase the fertility of the tract. The question of cattle improvement through dairy societies will be dealt with a little later.

I would, however, like to make it clear that the question of organising the producer and selling of milk in the city is by no means so simple as it looks; but if a serious attempt is made we may succeed.

In connection with the organisation of the producer of milk to supply any city, we should not lay too much stress on the sanitary side of milk production but rather try to organise the business first and then educate the producer to follow clean methods of handling milk without making it too costly. Cleanliness will follow the business organisation as soon as the producer learns that it pays to produce clean milk.

Butter.—Another important dairy product is butter particularly in Northern Gujarat.

It has been fully organised in the Western countries like Denmark, Holland and Ireland that the dairy farmer must be a manufacturer if he is to get the best returns. The farmer should not be content with selling his milk to a middleman who in turn supplies his cream to a distant butter manufacturer. Farmer's interest demands that the final product of his milk should be uniform and of a high quality. Unless the butter produced is of uniform and high quality, it would not fetch the best price just as in case of cotton or any other product, perhaps, more so in case of dairy product. There are many dairies handling butter in Western India and there are as many qualities as there are middlemen and butter manufacturers. This state of affairs cannot be economic for production nor fetch the best price for the product and the result is that the producer realises a small price as annas ten per pound of butter.

In the organisation of the trade as at present the farmer has no say and does not know how he suffers for his leaving manufacture of butter to a middleman.

Our butter trade depends on the outside market and if we are to realise the highest price, we must put the best and uniform quality of butter into market as our competitors do. History tells us that towards the end of nineteenth century Denmark producing superior quality of butter through its co-operative societies displaced quickly the Dutch as well as the Irish butter in English market. At present Danish and Australian butter is replacing our butter in Ceylon, Burma and Strait Settlements. It is high time we should do something to improve our product. The producer cannot achieve this single-handed nor by leaving it to others. Once he is well organised he can see to raising the standard of his product and improving the reputation of his produce as has been done in Holland and Ireland.

I have stressed this point a bit more as success of co-operative dairying in butter business centres round the production of first class butter which can secure the market and realise higher price by establishing name for the produce.

Northern Gujarat has a big trade; all the cream goes to Bombay or Ahmedabad where it is made into butter. Thus there is great wastage in transport and conditions are not favourable for the production of best quality.

If the cream be made into butter locally, at a central place like Anand, there can be big saving in cost besides helping to produce first class quality.

To do this a central factory is necessary. In Denmark and Holland such central creameries were started by the farmers by borrowing money from banks on the guarantee of their supplies of milk for a number of years. Fortunately we do not need this. At Anand there is a fully equipped creamery of the Military Department and which is just now being used as teaching centre and may be made available for five years for organising the dairy industry on co-operative lines.

What is required is that the Government of Bombay may have to undertake in the first instance to start manufacturing about 1,000 lbs. of best butter a day and sell it into best market and realise higher price for the best quality. Once this is done there will be no difficulty in organising the co-operative milk societies one by one. Our butter sells at Re. 1 to Re. 1-2-0 per lb. whilst the producer realises annas 10 to 12 per pound. The best butter in the market realises Re. 1/6 to 1/10 per pound. If we produce the best butter, we can realise much higher price. The milk or dairy society may be allowed to share the profit of the creamery in proportion to the supply of milk or rather butter fat. The creamery will be in a better position to pay something more for the milk to these societies. Thus in a few years' time the creamery may be supplied with milk by co-operative societies only and the central creamery may be organised entirely on co-operative basis.

I am afraid an ordinary society separating the milk and selling cream to a middleman does not show enough surplus to induce people to go in for it. The disposal of first class butter at a higher price is a far easier thing to do than the disposal of milk in a city. Edward Keventer of Aligarh gets always 4 to 6 annas more per pound for his butter. Besides there are enough Military Stations that may consume all the butter such a creamery can produce in the first few years.

Later on a possibility of exporting butter to Europe may be investigated with great advantage as we are producing lot of butter at a time when there is shortage in European market.

Ghi.—In the case of *ghi* production too if good *ghi* can be produced and quality guaranteed, perhaps higher price could be obtained; but apart from the better sale of milk or milk products, one very great advantage would be that cattle improvement for milk production would be possible and would give definite results in a short time.

Improvement of Milch Cattle.—The root cause of scarcity and dearth of milk is that our milch cattle are not profitable. Unless we improve these and make them more profitable, the whole industry may die out.

The only remedy for this is to organise the producer who keeps one or two buffaloes as a rule to keep a fortnightly or three weekly record of milk production, fat content and feeding.

Individual farmer cannot test the milk, though he can record the quantity; so it is necessary that the farmers of a village should organise and engage a milk tester for the purpose. Once this work is undertaken we will be in a position to find out how many buffaloes are causing actual loss to the owner and which buffaloes are the highest producers. With this knowledge we can breed from the best and improve the yield of milch cattle to a very great extent in a short time. My experience of actual record of a herd of 53 buffaloes at the college dairy is that the average yield is about 2,400 to 2,500 lbs. per year whilst some individual animals have given 4,000 and 5,200 lbs. a year. This variation is bound to be very big with our cattle in the district and it is easy to grade the herd with best bulls to improve the average yield. This shows big possibilities of improvement.

Our cattle as milk producers are far behind those of other countries. One of the Canadian bulletins gives the following information on yield of milk of cows of various countries:—

In Holland a cow produces on an average 7,585 lbs. of milk per year.

In Switzerland a cow produces on an average 6,950 lbs. of milk per year.

In Great Britain a cow produces on an average 5,934 lbs. of milk per year.

In Denmark a cow produces on an average 5,660 lbs. of milk per year.

In Germany a cow produces on an average 4,350 lbs. of milk per year.

In Ontario, Canada, a cow produces on an average 4,000 lbs. of milk per year.

Kaira and Ahmedabad, our best centres, would not average more than 2,000 lbs. of milk per head per year.

Now I will show what improvement has been brought about by means of Milk Record or Control Societies in Denmark:—

Year.	Yield of milk per day per cow.	Yield of milk per year per cow.	Amount of butter fat per year per cow.
	Lbs.	Lbs.	Lbs.
1864	10	...	68
1866 . . . . .	...	...	128
1908 . . . . .	...	...	242
1912 (of good cow)	27½	8,064	260
1912 (best cow)	53½	15,816	500

This shows Denmark increased the yield of butter fat by 50 per cent in 22 years and 300 per cent in 44 years.

Let us see what Holland has to teach us in this matter.

“Note on Agricultural Co-operation in Netherland” by Adams and Fant makes the following remarks on the question of Milk Control (Record) Societies of Holland:—

“One of the most valuable forms of co-operation in the country (Holland) as in Denmark, is the milk testing associations, which have been the means of very considerably increasing the yield of milk and also of butter fat from cows where the system is properly carried out.”

The records of 1906 of 60 cows forming part of one of the Milk Control Societies of Holland show the following variations in a herd:—

10 best cows averaged 1,313½ gallons each per year showing 3.36 per cent fat.

10 worst cows averaged 684½ gallons each per year testing 2.90 per cent fat.

It may be remembered that such a variation between good and bad cattle was there in Holland in 1906, i.e., 20 years after they started to pay attention to their dairy industry. Holland was one of the countries known for good milch cattle.

Perhaps if we start a milk control society in the Bombay Presidency we may find our cattle worse. The sooner we know this the better it is for our farmers and the dairy industry.

The cost of organising such a society would not be more than Rs. 400 per year for a village having 200 cattle, so it will come to Rs. 2 per cattle. This is the cheapest and surest method of improving cattle and ought to be introduced at once in our dairying tract. In Holland this is the only form of society

which gets the biggest help from the State. The scope of improvement is 50 to 300 per cent over the present yield and can give in 20 years as much as Rs. 100 or more increase per milch animal which is far more than what can be achieved in any other kind of farm produce. The industry besides is quite well centralised to facilitate organisation and perhaps the only main industry of Northern Gujarat where unfortunately least amount of agricultural improvement has been possible.

The improvement of dairy cattle will have a far-reaching effect on the production of crops as it is the chief source of manure. Baroda State has a village called Nar near Cambay which is a living example of what dairy industry means for fertility of land and crop yield. The soil of this village gives much higher yield of crops per acre than surrounding area.

If we are organising dairy societies for butter trade or city milk trade, the milk record work can be carried on along with it and can be used for paying for the milk on butter fat test once in four days. This will remove our difficulty of getting pure milk from the dairy society. Paying for milk on fat test is one of the most equitable and scientific way of paying for the milk. Perhaps testing once in four days will cost more but just to help the organisation of dairy societies and milk control societies in the beginning Government may bear this expense in the interest of cattle.

If the trade is organised on these lines, the industry will change the whole outlook of the tract and would ultimately help our cities and our public by supplying cheaper and more dairy products.

I would now put the following resolutions for the consideration of the Conference:—

1. Northern Gujarat being a most important dairy centre an extra Assistant Registrar Expert in Dairying should be appointed to organise the dairy industry of the tract.
2. The cattle improvement and milk record associations should be started immediately in the villages with a view to improve the milch cattle of the tract and Government should bear full expense for five years.
3. That the Government of Bombay may be requested to approach the Government of India for a free loan of Anand Central Creamery for five years to organise the production and sale of best butter on commercial lines in the first instance, with a view to organise the dairy societies in the different villages to supply the milk or cream to the central creamery, the dairy societies sharing the profit of the creamery in proportion to their supply.

(This note was written for Co-operative Conference.)

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) A pair of bullocks can cultivate 20 acres of land in cotton tract. The cultivator with such a holding will have work for a total period of about 225 days for himself and for 95 days for his wife and a child in a year. This is equal to one man's work over 320 days in a year. Bullocks will have work for 140 days.

Farmers of intensive crops on well or canal irrigation will have more work for all.

The average holding of the Presidency proper is little more than 13 acres. But holdings of 5 acres are found to the extent of from 38 to 64 per cent in different divisions and holdings of 5 to 15 acres are found to the extent of from 24 to 30 per cent. Thus 60 to 90 per cent of the holdings are below 15 acres.

This shows clearly that the majority of farmers would have work enough to employ one man of the family for 150 to 200 days in a year depending upon the size of the holding and the type and intensity of farming. In the slack season some farmers would be doing some carting work on hire particularly

near big towns and cities. Some are engaged in collecting fodder from trees, etc., for dairy cattle. Some classes of farmers take up the work of gathering fruits of mango trees and others and marketing them.

(b) I would suggest a subsidiary occupation like spinning and weaving for cloth required by the farmer and his family.

1. The spinning and weaving industry requires very little investment, viz., Rs. 30 to Rs. 40 only for a set of tools required.
2. The art of spinning can be easily learnt and can be practised in spare time by any farmer.
3. The yarn can be woven into rough cloth by the farmer and can be used with advantage to supply his simple needs which would thus save large expenditure on clothing.
4. This is the only industry which can be taken up by farmers of any tract.
5. If the farmer has no other more lucrative work and if he is not getting enough income from his holding the work of spinning and weaving would be very suitable and would save for a family of 5 at least Rs. 30 per year.

It is estimated that about an hour's work per day is enough to clothe himself.

6. No elaborate organisation is necessary for purchase of raw products and sale of finished product in this case.

A good propaganda to explain the advantages of the industry and provision for training the farmer and his family in the work would certainly revive the industry which is yet in existence in many parts of India. It used to be very common even in Gujarat some 40 years ago and is still in existence in Kathiawar where the farmers are in poor conditions.

(c) Poultry rearing is followed by certain farmers who have no religious objections. But the industry is in a poor state for want of proper education regarding the better breeds, their care, prevention of diseases and absence of proper organisation for marketing the product in the interest of the producer.

Fruit growing is limited by irrigation facilities and perhaps by want of educational propaganda and marketing organisation.

Rope making is done by the farmers themselves in Gujarat and is left to a certain cast people in the Deccan and is not much of an industry for farmers.

Basket making too will have a limited market and would have scope in certain localities only. Others too are of local interest and cannot be universally employed.

Vegetable drying and canning may give some industry in a certain season.

(e) If any suitable cottage industries can be developed they can be introduced in villages and can help a large population but ordinary industry say of cotton mill would not be able to provide employment for any large portion of rural population.

(f) I would certainly recommend that the whole question of finding rural industry suitable to rural population and able to employ a good proportion of them, should be thoroughly studied as I consider it essential to find some secondary occupation or industry if we are to improve the lot of the farmer.

(g) Increase of irrigation farming, intensive crop farming as vegetable or fruit growing, keeping dairy cattle and goat keeping all these are sure to give more work and supply valuable product for home use or for sale.

I believe the whole Khandesh can be turned into dairying tract like Northern Gujarat by a suitable propaganda and introduction of good cattle and this will benefit the cotton land and can maintain the production of cotton.

(h) Organisation of young men's unions in villages to carry out necessary educational propaganda for such work will help a lot. There are long vacations in schools and colleges and if these institutions start organisations for

such social works in villages it will have good results. Such attempts are being made in Northern Gujarat (Charotar) but it is too early to say how they would succeed. Much depends upon the leader.

QUESTION 23.—GENERAL EDUCATION.—(a) The present system of education makes young men unfit for agricultural work as explained under the heading of Agricultural Education.

(b) (i) I have already proposed the introduction of agriculture in the schools. But I would now suggest that the following subjects be included in the curricula for general training:—

Manual training to give practical work.

Physical training and games.

Elementary Rural Economics.

Rural Hygiene.

These coupled with the introduction of agriculture will improve the ability and culture of the agriculturist while retaining their interest in land.

(ii) On the whole the percentage of literates has decidedly increased in the Baroda State where compulsory education has been introduced some 20 years ago, and the percentage would have been more if there were the agency of social workers explaining the aims and objects of compulsory education and the facilities given by the State to meet the needs and requirements of poorer classes in matters of adjusting the school hours and vacations to working season and provision of free distribution of slates, etc.

The schools themselves are not working efficiently and satisfactorily because of the low calibre of teachers who fail to make schools inviting and instructive.

Ignorance of the parents regarding the usefulness of the knowledge imparted in schools.

Poverty of the parents that forces them to utilise the services of children for their occupation.

I would suggest that the working of the training colleges should be improved for training teachers who can make schools inviting and interesting.

Organisation of social workers in rural areas should be started to remove ignorance of the parents by proper propaganda.

School hours should be adjusted to the needs of the rural population. School hours may be reduced and schools may be held in the morning and afternoons to enable the farmers' children to devote themselves to farm work to help their parents.

There should be a system of free libraries for a village or groups of villages to enable the farmer to retain and develop the knowledge already gained in the schools.

Continuation evening classes for general culture should be organised.

QUESTION 25.—WELFARE OF RURAL POPULATION.—I would suggest that district non-official organisation for all sorts of social service in villages may be encouraged and the State may give grant in proportion to the sum raised by them to carry out schemes affecting the socio-economics of rural life.

Good leadership and sympathetic treatment from Government would not fail to give enthusiastic and good servants to such organisation.

GENERAL SUGGESTIONS.—It is not enough that competent research officers and the administrators should be content with simply turning out useful work themselves but it should be their duty to train other workers under them in their lines. I am afraid there is the usual complaint particularly regarding many well-known experts in India that when experienced officers leave the services for joining duties elsewhere or retire, they leave no one trained to continue their work efficiently. If this is true, there is something wrong with the experts or the system somewhere.

It is very important for the future development of Indian Agriculture that the State institutions and officers should train future workers, and I would

suggest that the efficiency of the experts should be judged not only by the amount of and quality of work they turn out themselves but to an increased extent by the number of men trained under them. If this point is kept in view I think we can supply the country with as many competent indigenous workers as we need. The original work done by the Indian officers in Bombay Presidency is marvellous considering that they have had nothing but general training.

If we are to bring about quick results and at a reasonable cost over a vast country like India it is absolutely necessary that the indigenous agency should be well trained by experts working in India and by sending them regularly abroad to the best research and other institutions.

The main advantage of employing the indigenous agency is that they are not likely to be lost to the country in the latter part of their service after acquiring great experience at the cost of State. Now as the country is going to be developed on democratic line more opportunities are thrown open to Indians for public service and retired experienced workers in agriculture and allied lines will be indispensable. Wherever such Indian officers are available their services are in demand by the State as well as semi-Government institutions.

Indian officers should also be given increasing opportunities for influencing the administration of various Provincial Departments and the Central Departments. It is unfortunate that differences in pay and prospects have been created in the Indian Agricultural Service on basis of nationality as it puts Indian officers at a disadvantage particularly in matter of going abroad and keeping up-to-date in matters of progress and I would strongly recommend that free passages once in five years should be given to all workers in agriculture to encourage or rather to make them go abroad like their European colleagues.

As far as I know in the Board of Agriculture for India not a single Indian member from the Bombay Presidency has been nominated as a member so long and only few officers have been visitors. It is necessary to take advantage of the more intimate knowledge and experience of the rural conditions possessed by the Indian officers in the discussion of the Central Board.

Oral Evidence.

8025. *The Chairman:* Mr. Patel, you are Professor of Agriculture at the Poona Agriculture College?—Yes.

8026. We have your note, and we are very much obliged to you for it, particularly in view of the very strenuous time you have been having in connection with the successful Agricultural Show. Do you wish to say anything in addition to what you have written in your note of evidences, or shall I proceed to ask you questions?—I have only two points to add, which I had left out in my statement. There is first of all the question of saving expenditure on litigation by the farmers. There is a lot of money wasted in litigation. If some means can be found to save that, it will be a great help.

8027. Have you any practical proposals to make?—I would suggest that some local panchayet or some body may be established for deciding suits. Anything like that which will not entail much expense to litigators will be helpful.

8028. Do you know whether legislation would be required?—Legislation would be required.

8029. Without such legislation, do you say the cultivator will not be able to contract out by arbitration?—No. I want a body to settle matters which are local. The next point is cattle-breeding and development of the dairy industry. The military dairy farms may be utilised. I would suggest that the Civil Department is capable enough to undertake the supplies of the military, and if these farms are managed by the Civil Department they can be used both as dairy farms and cattle-breeding centres.

8030. Do you think that these military farms which are stocked by half-breeds would make any contribution towards the improvement of the local breeds?—No. The question of crossing is a separate problem. I want to use those farms also for production of milk for the city.

8031. Are you an expert in cattle-breeding?—I have studied cattle-breeding.

8032. You are aware that these military farms are stocked by half-breeds? Do you think so long as they are stocked by half-breeds they are likely to make any substantial contribution to the improvement of the indigenous breeds?—Through that medium, as it is at present, nothing can be done.

8033. In other words, you want to use the buildings and establishments of the military farms in order to improve local breeds?—Yes.

Those are the two points.

8034. Under Research, you advise that research workers should go abroad. At what stage of a research worker's career should he go abroad?—After he has put in some work on a particular line here.

8035. Do you believe in training Indians for research work in India before sending them abroad?—I believe in their first getting acquainted with their local problems and doing some work before going abroad to get up-to-date information.

8036. You do not contemplate training Indians in Europe for their degree?—No.

8037. Nor for their immediate post-graduate work?—No.

8038. You want them to begin work here and then go abroad?—Yes.

8039. At what age would you have them go abroad? Would it be at the age of 27?—It may be 27 or 30. It all depends on the educational system, which now keeps them up to an age of 25 or 30 or even longer in certain cases.

8040. Do you recruit them at 30?—They are not recruited at 30, but many of them are from 25 to 30 or it may be above 30 when they get into the work. They are recruited directly into the subordinate service, and after they have worked there for a certain time they get on to research work, and afterwards it may be desirable to send them abroad.

8041. Then in your opinion, research work as well as administrative work in the Presidency has developed so much that it would be better if division of work was made possible by leaving the administrative work to the Director and research work to a suitable Joint Director. Does that suggestion spring from your view that administrative work is crowding out research work?—Yes. They are two kinds of work; a man must do either the one or the other. It is not always possible, to have an administrator as well as a research worker in one man.

8042. Have you contemplated setting up a Secretary and a small Secretariat?—Nothing of that kind.

8043. You see, your suggestion here is to take research work out of the hands of the Director altogether?—No. The Research Director may be Joint Director.

8044. You have made a suggestion that research may be financed partly by public contributions. Have you any indication that public subscriptions would be forthcoming?—A lot of subscriptions have been raised by the influence of important officers for other purposes. If an attempt is made I think many will come forward to subscribe.

8045. Then, further down, you say that the question of studying the digestibility of local fodder by various breeds of cattle in Western India is an important one. Are you aware of any animal nutrition work being carried on in India?—Yes, they do that at Bangalore.

8046. Do you suggest that this Presidency should have an animal nutrition section?—Yes. The difficulty here is that we have local breeds of cattle. I understand that at Bangalore they have found that much depends on the type of breed. As we have different breeds, we must have a centre for this Presidency.

8047. On page 527, you have given your views on Agricultural Education, and as with most people who have considered this problem, your ambition is to educate without unsettling the cultivator and driving him from his land?—Yes.

8048. I see that you would carry your agricultural flavour into even elementary education?—Yes.

8049. Do you think that there is any danger that might prejudice literacy as such?—I do not think so. I am not suggesting making it technical at that stage. I should use it as a means of general education.

8050. You will probably agree that anything in the technical line which might have the effect of taking up some of the very precious time which the child has before it in its elementary stage might be prejudicial to the requirements of the maximum degree of literacy and might be a waste of time?—Yes, I do.

8051. Have you followed foreign educational systems in relation to this rural problem?—No, I have only a very little knowledge of it.

8052. You have probably gathered from such attention as you have found time to give to the problem that it has a world incidence and it is not an Indian problem especially?—Yes. But I would say that in India, where there is such a large population which is agricultural, it will be a great mistake to divorce agriculture from education altogether. I personally believe that a great mistake was made in India when education was given without any relation to agricultural life, that is, the line that the majority of the people follow in their life.

8053. That is no doubt true up to a point. But do you not think that whatever education you give must have the effect of widening the horizon, quickening ambition, and to a certain extent must have the effect of unsettling agricultural children?—I should think that agriculture provides just as good a basis for general education or cultural education as any other subject. My idea is to give agricultural education to all so that the majority that have to go back to land will make use of it.

8054. I do not know how far you have carried in your own mind the details of your plan to form a board of education to control and administer the educational system. Have you considered the constitution of any particular board of that sort?—I would suggest that about one-third of the members should be from the Agricultural Department.

8055. That body would have to lay down the course?—Yes.

8056. To frame the curriculum, and not to administer the schools?—Not to administer. Under Administration, in answer to one of the questions, I have suggested that some inspectors and the higher staff may be agricultural graduates.

8057. *Dr. Hyder*: Would your board of education be on the same lines as the boards for high school and intermediate education in other Provinces?—It would be something like that, but I would have a board for primary and secondary education. At present I understand that primary education will go to the local boards, but there is some departmental control over the curriculum.

8058. In the other Provinces the high school and intermediate education is under such a board?—Yes.

8059. *The Chairman*: Have you any views about the Loni type of school other than those you have set down in your note?—As I have stated I do not think it is enough, they will not take to farming because the elementary education given to them has changed the whole atmosphere.

8060. Have you had any experience of the boys who have been through the Loni school?—Yes, I know some of them, many of them seek service.

8061. What service?—Government service or service under institutions like the local bodies.

8062. They take to any service rather than return to their parental occupation?—Yes.

8063. Do you know anything about the cost of education at the Loni school?—They spend about Rs. 12,000 a year for the course of two years for 50 boys.

8064. Do you suggest that the Loni type of schools should form any part in the structure of rural education as a whole?—I have suggested that they should be training schools only in the beginning. Later on they will be technical schools.

8065. I observe on page 529 that in your view compulsory education should be made general?—Yes.

8066. Do you think that public opinion is ripe for that movement?—In fact vocal public opinion is ripe. The non-vocal public perhaps know nothing about it. It is a question of giving a lead rather than their demanding a thing and then giving it to them.

8067. I see you propose to finance primary education by an export tax?—No, any tax may be levied. I would suggest a big loan even to finance that, because I find that unless we do that all our activities are hampered. I would put it before anything else for purposes of development.

8068. If the interest and amortisation are to be borne by the export trade, your loan is really only a smoke screen if I may say so; what you are going to do is to put the charge on the export tax?—Of course, it would be a very small tax. Somebody has to pay for it. If we can cut down expenses elsewhere and pay for it in that way, so much the better for the taxpayer.

8069. Can you suggest any reason why those cultivators who happen to be producing raw materials for export should pay for the education of the children of cultivators who are producing for the internal market?—It is true; it is not equalised, but this is a question of exigency. If we can find a better method, we should by all means adopt it.

On that point I will leave you to *Dr. Hyder* who was on the Taxation Committee. He will ask you questions about it.

8070. On the same page you say that the standard of living acquired at these educational institutions is very high. Do I understand you to mean that without a drop in a man's standard of living he cannot return to cultivation?—That is quite true. These people are accustomed to spend from Rs. 30 to Rs. 50 a month at the college; when they get out there is no means of their earning a living to keep them at that standard from an average farm.

8071. How do they acquire that standard during the period of education?—I think the life of a student at college is quite different from the life that his parents live at home. This difference is not found in any other part of the world to the same extent as in India. It is a big factor.

8072. *Dr. Hyder:* How much do your students at the Poona Agricultural College spend?—They spend not less than Rs. 30 as boarding charges per month. Total expense is Rs. 50 a month.

8073. What is the tuition fee?—Rs. 60 a year.

8074. *The Chairman:* Are you talking of the average scholar?—I am talking of the average student.

8075. Who gives them the allowance?—There are scholarships; otherwise the parents supply the money.

8076. What I want to get from you is, how can parents afford to raise the standard of living while the boy is at the college though they cannot afford to maintain the standard of living when he returns home?—If the parents have landed property they will mortgage it; if any one lends money they will take loans. They want their boys to have this education simply to get a job afterwards. They cannot afford it, but the student spends at the college as much as the whole family spends at home.

8077. Have you any methods in mind to reduce the standard of living?—I would not put it that way. I should say unless the expenditure is reduced and unless we give agricultural education to the men who are not going up to the college, we will not get the average educated man to take to farming.

8078. You give some interesting figures of the business of a Khandesh farmer of Pachora taluka employing hired labour and farming on his own land for the last ten years. How did you get those figures?—I got them from the farmer, who has kept all the accounts. He is one of the leading farmers there and an Arts graduate. I asked for the figures and the averages are as given by me.

8079. Do you accept his figures?—I have every reason to accept them, though I would like to examine them myself. In the second case I have given I have gone into the figures myself.

8080. You did not go into them in the case of the first case?—No.

8081. What about the quality of the land?—The land is of good quality. Pachora has good land and the rainfall there is steady.

8082. Is it dry farming?—It is dry farming, but the land is of good quality.

8083. Have you seen the land?—I have seen the land, and his farm is good.

8084. Do you happen to know whether this man is in debt?—He is probably not in debt. He owns lands about 100 acres in extent, and his personal expenses are not high.

8085. Where does he live?—He lives near Pachora.

8086. Is he living in his own holding?—Yes. He left the service and took to farming; he is a good worker on co-operative and social lines.

8087. Then, in the case of the farmer of the Broach district you have examined the figures yourself?—Yes.

8088. And do you happen to know the land?—Yes.

8089. What is its quality?—It is of fairly good quality; it is a cotton land. Some of his lands are on the river-side and subject to floods at times, but it is fairly good average quality.

8090. How do you account for the difference between Rs. 11 per acre net in the case of the Pachora farmer and Rs. 25 net in the case of the Broach district farmer?—The Broach district land is of higher quality and the rainfall is also more assured. Although certain seasons are bad, the soil is better.

8091. Do you really suggest that that difference accounts for the difference between Rs. 11 and Rs. 25?—Yes; the conditions are much better in Broach, and in the Broach land Broach cotton is grown which fetches a higher price in the market.

8092. Can you give the Commission any idea of the crops grown by these two men?—Yes. The Broach man had on an average for ten years 28 acres under cotton, 10 acres under *juar*, 6 acres under wheat, and 4 acres under other crops, total 48 acres. The other farmer had 30 acres under cotton, 11 acres under ground-nut, 23 acres under *juar* and 21 acres under *bajri*. In this case I could not get the figures for ten years. The figures I have given are for one year. I have his figures only for two years.

8093. Do you think that is typical?—Yes; he is getting more ground-nut grown now than before.

8094. When did you get these figures?—I got the Pachora farmer's figures about a month ago. The Broach district farmer's figures I got about four or five months ago.

8095. How do they compare with the average for that class of land?—The Ankleshwar figures will be better than the average, because the farmer is an agricultural graduate and there is no difficulty from the point of view of capital in his case.

8096. Were you surprised at these figures when you got them out?—I was, and the farmer himself was surprised. He had figures for ten years, but he had never worked out the average. There are very great differences in the figures from year to year, and that is due to the seasons.

8097. Have you consulted your colleagues of the Agricultural College at all on these figures?—No. The article on this is not yet prepared. I am going to prepare an article for the College Magazine on the Ankleshwar farmer. I may say one thing in this connection. Part of the land was purchased by him and he has paid 9 per cent. interest on the capital. If that interest is not taken into consideration, it will be Rs. 38 per acre in his case that is assuming he does not pay anything for the land.

8098. *Dr. Hyder*: Are these figures arrived at after taking into account all the incomings and the outgoings?—Yes.

8099. But he has himself been managing, has he not?—Everything that is produced on the land is valued. If he sells 10 maunds of wheat and takes 2 maunds for his personal use, he takes the average he got for the 10 maunds and values the 2 maunds on the basis of that average. It is not a matter of estimates.

8100. Does he employ labour?—Yes. All his labour is employed.

8101. Has he deducted wages for himself?—He has deducted no wages for himself.

8102. *Mr. H. Calvert*: Has he deducted expenses of land revenue?—Land revenue is included wherever it is his own land that he cultivates.

8103. He has included it in his expenditure?—Yes.

8104. *Sir Henry Lawrence*: The figures are arrived at after deducting land revenue?—Yes.

8105. This is the net return after paying all the expenses and all taxes?—Yes, the net farm return per acre.

8106. *The Chairman*: Do you happen to know what the land revenue was?—That is the only point I omitted to get.

8107. I hope you can get those figures for the Commission?—I can send them.

8108. On page 530 in answer to Question 5 (a) on Finance you say, "The cultivators cannot afford to pay higher interest than 4 or 5 per cent. on their outlay and therefore steps should be taken to provide capital to the co-operative banks or land mortgage banks loaning money to the cultivators at a rate that will enable them to loan it to the farmer at not more than 5 per cent. interest." Can you suggest a method by which that operation can be financed?—I would suggest through the co-operative banks.

8109. Do you think it is possible for the Provincial Government or the Government of India to find the money for this?—I have suggested two things. The Government of India are getting loans from the rural population, and the Imperial Bank is getting loans from the rural population at about 3 to 3½ per cent.

8110. Yes, I am coming to that in a moment. What will be the position of borrowing money at the present rate?—There will be loss.

8111. Now let us come to the 3 or 3½ per cent. loan from the rural depositors. Do you suggest that punctual payment of interest and punctual repayment of the principal should be insisted upon in every case?—Yes.

8112. Otherwise of course the financing at these low rates of interest becomes impossible, does it not?—Yes, I agree.

8113. Do you know what the cultivators think of any rigid regulation in that respect?—Yes. But I would not give them full liberty for misusing the credit in any way. I would control that very strictly through the co-operative banks or through the agency that lends the money.

8114. But again you are going to insist upon productive expenditure?—I would.

8115. What are you going to do in famine years?—In famine years, there are the famine funds to help them and funds should be made available from that fund.

8116. Discounting the famine funds, is it the case that *sowcars* usually forego interest in famine years?—They do not forego interest, but postpone the collection of it.

8117. Which, from the cultivator's point of view, attracts him almost as much as if the *sowcar* did forego, does it not? From the cultivator's point of view it is almost as satisfactory if he can persuade the *sowcar* to forego his interest even though it is set against principal and charged at compound interest rates as it would be if the *sowcar* did in fact forego? The cultivator does not worry about the remote future, does he?—He does worry about his debts.

8118. Do you suggest if money was lent at, say, 5 per cent., that punctual and complete repayment could be secured in a famine year?—In a famine year we may have to give special facilities.

8119. Because the depositors who have placed their sums at 3 or 3½ per cent. would have to be repaid. Would they not?—Yes. I do not suggest that the Imperial Bank which takes the deposits should lend directly to the cultivators. Part of the money they get from the rural population would be placed at the disposal of the institutions which lend money to the cultivators on secured guarantee.

8120. Of course the charges incidental to administering loans under those conditions would be substantial?—Yes; they would have to be. If we have the co-operative banks, they will perhaps have to add one per cent. to the rate at which they get the money.

8121. Do you know at what call the depositors' money which lies at 3 or 3½ per cent. is lent? Immediate call, I suppose in the savings bank?—Yes, at immediate call.

8122. Are you going to sink money at immediate call on land improvements?—Well, it is indirect and not direct.

8123. I follow your idea, but I think it is financially unsound. The loan will possibly have to be met by the general taxpayer?—Yes, system.

8124. Under Animal Husbandry, in connection with your answer at page 531, I want to ask you a specific question, which my colleague Sir Thomas Middleton would have asked you if he were present. Do you associate in your mind enclosure of land by fencing with improvement of the breeds of cattle?—So far as Northern Gujarat is concerned, there is fencing all over the fields.

8125. How do the cattle there compare with the cattle in other parts of the Presidency?—They are better cattle, although there is not so much grazing. I do not think extensive grazing is absolutely necessary for better cattle.

8126. Is fencing in Gujarat due to the fact that they have got good cattle, or is it the fact that they have got good cattle because they fence?—I do not know to what extent we can say it is due to fencing, but the farming as a whole is more intensive and more careful.

8127. Can you suggest any means by which breeding can be controlled unless cattle are fenced?—Ordinary village grazing is not suitable. Fencing will be necessary wherever they have good cattle.

8128. On page 530, dealing with the question of indebtedness you say, "But to start with to reduce the existing debt the application of the Usurious Loans Act would be necessary. Side by side with that facilities of long-term cheap credit may be provided for redemption of mortgages." Have you studied the working of the Usurious Loans Act?—No; I have not studied it in detail.

8129. Have you ever known of a case of its being operative in this Presidency?—They have the same sort of Act in the Deccan Agriculturists Relief Act. It has the disadvantage of reducing the credit of the farmer, but I would not mind that.

8130. Are you familiar with the terms of the Usurious Loans Act?—As I understand it nobody can be charged beyond 9 per cent. or 12 per cent., and if he produces his accounts, the moneylender will have to limit his interest to that.

8131. Do you know with whom the initiative lies as regards the putting into force of this Act?—Unless he goes to the Court, it is not effective.

8132. On page 531 with regard to agricultural implements, I see you suggest that foreign manufacturers and others might be persuaded to establish factories in India. Would you not rather see Indian commercial initiative step into this breach?—The difficulty there is that these people have not got the expert knowledge required and it will take years to come before they can acquire any expert knowledge.

8133. Do you suggest any practical means whereby experienced manufacturers might be induced to step in and start factories in the Presidency?—They would like to have a certain market, before they could undertake anything.

8134. Would you suggest giving certain firms a monopoly? Is that your idea?—I do not think that will help them very much; some facilities must be given; I cannot say what they should be.

8135. You have not thought that out?—I discussed the matter with some of the firms in America, when I visited that country. Those people expected such a big market at home that they were not keen on starting factories in India. They wanted to see if there was a market, and if there was they would undertake it any time. Once we have got a market for these implements, the rest will not be so difficult.

8136. May I know what you mean by 'certain facilities'?—Do you mean capital or some other inducement to come and establish themselves here?—You are not thinking of the deposit of money again, are you?—No.

8137. How about this figure on page 533 about the supply of milk in cities? You say it comes to 13 to 27 lbs. per head of population?—It should be 13 to 27 lb. per head of population.

8138. What prospect do you think there is of developing a sound dual purpose animal in this part of India?—We have about two or three breeds which have got certain dual purpose qualities. One is the Kankrej breed in Surat; then we have got the Gir breed which is the Kathiawar breed, and in North India they have got a suitable breed, the Central India has Nimari breed; I do not know how far the last two have milking qualities. If the best animals are purchased for a certain number of years and a selection made, we may get certain material for dual purpose animals.

8139. Is any attention paid to the cow in the way of proper feeding and attention?—Attention is paid in the case of the Gir cattle.

8140. Do you think the she-buffalo is more and more taking the place of the cow as a milk animal?—It has already taken the place of the cow in that respect.

8141. Completely?—Yes, completely.

8142. Would you reverse that if you could?—I would, but we must consider the period within which we could do it.

8143. You do not think it can be done?—It will take time. I think I have put it at 100 years, but I believe at the present rate, if we do not do any intensive work, it will take 200 years. I doubt whether even in 200 years, we could get enough good animals to supply to the farmer for dual purposes.

8144. How about the demand in that respect? Is the consumer distinguishing between buffalo's milk and cow's milk?—Yes; there again, we have to educate public opinion to take cow's milk.

8145. *Sir Henry Laurence*: At present they will not take it?—No, excepting in cities; and even in the cities people prefer buffalo's milk, because it is rich in cream. It has more than 7 per cent. fat.

8146. *The Chairman*: Do you attach any importance to the difference in the melting points of the two facts?—Yes; from the point of view of *ghi* production or marketing this product.

8147. But, in relation to *ghi*, it is a question of convenience in cooking, I understand. Is it not?—Yes. The point is that people prefer the cooking convenience and the appearance. Cow's *ghi* is yellow, and also it boils up quicker.

8148. Do you think it is the case that the difference in the melting point of the two classes of *ghi* is important to the market?—To certain people; not on a large scale.

8149. I see that on page 534 you stress the unwisdom of attempting to insist upon too high a standard of hygiene in the earlier stages of the development of the dairying industry?—Yes; they cannot go ahead, because they want a lot of money to start co-operative depôts; that is the handicap. Unless people pay more for it, it will not be feasible; the producer will not follow it.

8150. Do you think that the standards which you are thinking of might be relaxed to some extent, without endangering the public health?—I would not go beyond what is done at present.

8151. You would not aim too high in the earlier stages of the development of the dairying industry in India?—No.

8152. Now is your opinion as to the loss which farmers incur who are not manufacturing their butter founded on a close study of the economics of the dairying industry?—Yes.

8153. How many cows does the average farmer, of whom you are writing here, possess?—The average farmer keeps one or two buffaloes and no cows at all. The yield is about 2,500 lbs. per milking buffalo.

8154. Do you suggest that it is good business for the owner of two or three buffaloes to use the milk himself to make the butter?—He cannot make it at all; and the temperatures and other things will not allow him to make it. He is making *ghi* at present or selling the milk to middlemen who separate it and then send cream to the cities.

8155. I did not quite understand these words on the same page, "In the organisation of the trade as at present the farmer has no say"—I mean he simply sells his milk.

8156. He does not know how much he suffers, by leaving the manufacture of butter to the middlemen?—No.

8157. But, if the middleman did not make the butter do you suggest the farmer could make it himself?—He can only do so if he organises himself in a co-operative way.

8158. He would have to get enough cultivators together and have a small creamery and bulk the milk?—Yes.

8159. Does such an organisation exist anywhere in the Presidency at present?—No; no co-operative concern exists but the creamery exists organised by the Military Department, and there are other separating stations organised by a number of other private merchants.

8160. Are the Military Department buying the cultivator's milk for these creameries?—They were doing so before, but now they have stopped it since the War was over, and the dairy at Anand has been handed over to the Dairy Department of the Government of India.

8161. Where do they get their milk from?—They get it from the farmers; and the cultivators do not sell direct, because they produce small lots. There are middlemen again who collect the milk from the farmers, and then sell it to the creamery.

8162. It is only a question of finance on their own part?—Yes.

8163. Do you suggest that the cultivator ought to be able to carry on his own milk to the creameries?—No, I think not individually, they are too small. It will have to be organised into groups.

8164. I still do not quite see why you hold on to the view that the cultivators are losing money owing to the sale of milk to middlemen for the purpose of making butter?—Because the butter produced is not of first class quality. There are as many qualities of butter as there are merchants in the trade, and so the ultimate loss comes on the farmer.

8165. Which, do you think, as a general rule pays best, the sale of milk by the producer as whole milk, the sale of milk by the producer as skimmed milk and cream, or the sale of the milk as cheese, butter or *ghi*?—Whole milk will pay the best.

8166. On page 535 after an interesting survey of the difficulties of the industry, you cut the Gordian knot by again summoning the Government of Bombay, that is the general body of taxpayers?—Yes.

8167. I am sorry to reiterate the point, but it is very important?—That is all right.

8168. You suggest that the general body of taxpayers should come forward and start manufacturing about 1,000 lbs. of the best butter a day, sell it in the best market, and realise high prices for the better quality; once this can be done, there will be no difficulty in organising co-operative milk societies one by one. How do you connect these things together?—Because, unless we produce a better quality of butter and get better prices, we cannot induce the farmers to organise. Ordinarily, we will not be able to give a better price unless we organise for the production of better butter.

8169. You are going to make a market for the better quality?—There is a market already.

8170. You are going to extend it?—There is no quality. The material given is of inferior quality. There is a difference in price, as I have stated. Certain people get high prices for a higher quality.

8171. How are you going to build up the market for quality, by means of putting 1,000 lbs. of the best butter, at the expense of the Government of Bombay, on to the market?—The military stations are buying a lot of butter now at Rs. 1-3-0 to Rs. 1-4-0 per lb. and some of these military stations are selling to their customers at Rs. 1-8-0 per lb. If we can supply that market

with the best quality of butter, then we can organise these people, and instead of this money going to the middlemen, it can go to the cultivator.

8172. Is Re. 1-8-0 per lb. retail a fair price?—Yes.

8173. Do you think that the market is capable of substantial expansion?—Yes; the military stations in different parts of India are taking a lot of this butter.

8174. But you see you have got not merely to capture that market; they will still have their butter to put on the market; you have got to extend the demand until you have enough demand to buy the product of the military farms and of the dairy farms of the Government of Bombay, which is going to make 1,000 lbs. of butter a day, and then all the co-operative societies will come along?—I am misunderstood. This military dairy is buying from the market; they are not making their own butter from their own produce; they are buying from the manufacturers of butter, and there will be no loss in the working of this concern by the Government.

8175. How?—If the Government organise it, it will pay all the cost; it will be on business lines.

8176. I rather gathered that you contemplated by this means extending the retail market?—No extension; only change it from one to the other, producing butter of better quality, and giving it to the co-operative societies rather than to the middlemen.

8177. Do you advocate milk records being kept?—Yes.

8178. And you contemplate the possibility of these records showing an even worse state of affairs than that which you estimate as being the present state of affairs?—Yes.

8179. Is that your present estimate?—Yes.

8180. On page 537 you say, "If we are organising dairy societies for butter trade or city milk trade, the milk record work can be carried on along with it and can be used for paying for the milk on butter fat test once in four days?" In a hot climate, you have to test it once in four days; and pay on that test of quality as well as on weight basis?—Yes. They follow this practice in these dairies.

8181. Are there any societies in the Presidency at the moment paying on butter fat tests?—There is no such society at all.

8182. Do you know of any other producers or manufacturers of butter and other products who are paying for their milk or cream on a butter fat basis?—The Anand concern and one or two private separating stations are paying on the fat percentage.

8183. Which stations?—There is one private station, which has a dairy here and which buys milk from Gujarat, not directly from the cultivators but from the middlemen. The middlemen buy only on a rough lactometer test and sell to the creamery or separating station on test taken on every four days.

8184. And that transaction is carried out on a butter test basis?—Yes.

8185. It is a far cry from paying on a butter test basis or a fat test basis for bulk to paying on a fat test basis to the producer?—Yes. That is why I suggested there would be cost, but that cost will pay for itself in the interest of the improvement of cattle. In this way we shall know also the butter fat content of the animals for milk records which we may take once in three weeks, and the butter fat test may be guaranteed, once in four days, if there is business.

8186. Your ambition is that the owner of two or three milch buffaloes should receive payment on the basis of butter fat content?—Yes. That involves some more expense; but there is no other way to make them sell pure milk, unless we have enforcement of a legal standard, which has not come into existence here. Of course, that will have to be coupled up with any such

8187. Your ambition is to improve the milk yielding capacity of the local cow, and not of the buffalo?—Here I refer to the buffalo, and I would side by side improve the milk yield of the cow.

8188. On page 539, you are talking about general education, physical training, games, etc. Are not games played in these schools at the moment?—Some games are played, but they are not on an organised basis. I would make it a compulsory part of the curriculum.

8189. I do not much like the sound of compulsory football myself?—Yes, that is right; but there is a stage when we have to do something that we do not like.

8190. Have you any views about adult education as a means of decreasing the illiteracy of the rural population?—Ordinary visual cinemas and stereoscopes, or by means of magic lanterns and demonstrations. Then there are night schools, but they have not been very successful yet. But the cinema, the magic lantern and demonstrations may be successful.

8191. What do you think about the cinema as a means of propaganda?—It will be a very useful means.

8192. Enough by itself, do you think?—It will not be enough by itself, but part of the general propaganda. Of course, there is no other way to educate the illiterate public.

8193. You admitted just now that you thought that the sale of whole milk was the most profitable market?—Yes.

8194. How do you reconcile that statement with the one that you make somewhere in your written statement that it is easier to sell butter to the urban population than to sell them milk?—I was referring to co-operative organisation. I was referring to only two types of co-operation, an organisation to sell milk in cities and an organisation to make butter. These markets are existing at two different centres.

8195. Is it a question of the relative perishability of the two articles?—Yes.

8196. *Sir Henry Lawrence*: You are a *Pattidar* of Gujarat?—Yes.

8197. Are your remarks based on your experience of the dairy work in the neighbourhood of Anand?—Yes.

8198. Centred on Anand?—I was in Ahmedabad for three years; I know that district. I was also connected with the Anand work for nearly three years. Then I started a dairy company in Ahmedabad.

8199. Are creameries established around Ahmedabad as well as around Anand?—At Ahmedabad they have got a separating station, and also at Anand and at Nadiad there are creameries.

8200. Are they private concerns?—One was a Government concern, the Anand Military Dairy; the other was an Indian Dairy Co., Ltd., of which Messrs. Duncan Stratton were the managers during the War.

8201. Has it gone into liquidation?—It was sold out. They made a lot of money in the War time. They sold out as soon as the War was over.

8202. Is it still continuing?—Now it has gone into liquidation.

8203. They sold out to some people?—Yes.

8204. Do they carry on now?—They have liquidated and dissolved.

8205. Because it failed to pay?—Yes.

8206. Has any other company started there?—No.

8207. There is now no private company working a dairy; the only institution of the kind is the military dairy?—Yes. It is now a civil dairy under the Dairy Department of the Government of India.

8208. Are there any similar institutions in Baroda territory, adjoining Anand?—No. They have got only separating stations, run by middlemen who sell the cream to Bombay and Ahmedabad.

8209. No assistance has been given in the Baroda territory to similar institutions?—I do not follow.

8210. You have suggested that the Bombay Government should give certain assistance to run the thing. I want to know whether any such progress has been made in the adjoining villages of the Baroda Government?—Nowhere. I only suggest that the trade should be organised, if we want to improve the conditions of the farmers there.

8211. *Sir Ganga Ram* : You are Professor of Agriculture?—Yes.

8212. What subject do you teach?—Agriculture and dairying.

8213. Do you teach them how to analyse the soil?—That comes under the Agricultural Chemist.

8214. I thought you were educated in America?—No.

8215. Do you not know it yourself?—We teach the physical analysis of soils under the agricultural section.

8216. Can you say what are the elements which make a soil more suitable for growing wheat than for growing *rabi juar*?—I can tell from practical experience.

8217. What is your practical experience?—By seeing the soil. If I want to grow a winter crop of wheat, I can see the retentiveness of the soil by appearance, as well as by physical test.

8218. What is the difference between the scientific analysis of the soil suited for *rabi juar*, as compared with wheat?—I would not base my conclusion only on the scientific analysis.

8219. I want scientific analysis. Do you know it?—Analysis alone will not give us enough basis to say whether it will grow this crop or that crop.

8220. Do you know scientific analysis?—Yes.

8221. Of soil suited for wheat as compared with *rabi juar*?—Yes.

8222. Can you give me that scientific analysis?—Clay soil in certain conditions will grow wheat as far as the Bombay Presidency is concerned, if it is sufficiently retentive of moisture. The nature of the soil coupled with the rainfall or irrigation will tell me whether it can grow wheat or *bajri*.

8223. Do you teach them also such engineering as will enable them to stimate what will be the cost of lifting water?—Yes.

8224. How much would it come to per foot of depth?—We work it out for different systems. There is the *mhote*, the oil-engine, and other means. It is different for each.

8225. Could you give us your past experience?—I cannot give you these figures off-hand.

8226. With regard to these figures that you have collected, what do you think was the value of the crops per acre?—I have given the total.

8227. What was the value of the crops per year per acre over the 48 acres?—I can tell you. It is Rs. 33,000.....

8228. That is for 10 years?—Yes. If I divide it by 10 and 48, I can give you the figures.

8229. What is it? That does not suffice to pay the interest on the land? What was the value of the land?—The value of the land that was purchased by him was between Rs. 200 and Rs. 250 per acre.

8230. How much was realised? What percentage?—After he paid 9 per cent. interest, he realised Rs. 23 per acre.

8231. And after paying all the wages?—Yes, and the interest on the purchase value of part of the land.

8232. You cannot say what was the figure as regards the value of the crops?—I can.

8233. You say that the river was near by the land. Did you not advise them to lift the water from the river?—Was this area irrigated or not?—No. It is dry cultivation.

8234. At what level was the river?—It is not very high land, but he has got land which will not stand irrigation. It will get salty. It is heavy cotton land, which will turn salty if you irrigate it.

8235. By irrigation the land becomes salty?—Yes. The salts will come up; it will not stand irrigation.

8236. Not if the spring level is far away?—There is no good drainage underneath.

8237. You advocate the zamindars selling the whole milk?—Yes, if there is a market for it.

8238. All your schemes are for the benefit of the urban population. What is the poor man to get for himself?—If he sells milk, he will get some money; if he sells *ghi*, he will get nothing. If he sells milk, he will get a better price and be able to keep something for his own use. If he sells *ghi*, he will have a loss.

8239. With *ghee* he will have the curds?—That is not enough. He gets much less money for it. It is a question of educating them to the utility of the food value of the different things he produces.

8240. Do you think it is of economic advantage to him to sell milk and produce butter at the rate of Re. 1 per lb.?—Yes. It pays a little better than *ghi* making.

8241. What is the rate for *ghi*?—In the market it is 14 annas a lb. If you purchase butter and boil it, 1 lb. of butter will give $\frac{1}{2}$ lb. of *ghi*.

8242. *Dr. Hyder*: With regard to your suggestion of an export tax, are you aware whether such taxes are levied in other countries?—No. I have not studied the question from that point of view.

8243. What is your view of the incidence of such taxes?—If it is a big tax it will fall on the farmer. But my point of view is that if you want to make progress somebody must pay for it.

8244. I agree somebody must pay for it, but the question is whether the measure you are advocating is the right kind of measure. What effect would such taxes have on the area cultivated and the profitableness of farming?—If you put one anna or two annas per maund on the grain produced and if an individual farmer is producing 100 maunds, it will affect him to that extent; but it will not come wholly from his pocket.

8245. Somebody else will pay?—The middleman will pay to some extent, but 50 to 60 per cent. may fall on the farmer. Local bodies find difficulty in taxes for education. If you ask him to pay a direct tax he will not do so. It is a question of taking money from him without his knowing it.

8246. That may be so, but I was concerned more with the area cultivated and the profitableness of farming?—If he is farming 15 or 16 acres he will have to pay Rs. 5 to Rs. 10.

8247. Do you think he could bear it?—I would prefer the State to bear it, because the landlord taxpayer and the farmer taxpayer have paid more than enough for the last hundred years. They have paid the major part of the revenue.

8248. Who?—The farmer.

8249. The cultivator?—Yes. I would prefer him not to be taxed, but there is no other way to help him. If no money is raised, nothing can be done to help him. We have till now developed our roads, the educational system, hospitals, etc., without doing much for rural development. Now it is a question of how to get money to help the farmer.

8250. You would like to heap more taxes on the cultivator?—I would not if I could help it.

8251. But you tax only one kind of produce, the produce that is exported, and not produce in general?—I have suggested that because it is simple to collect.

8252. Would you tax all agricultural exports, or only such things as wheat and rice?—No. Only the major exports.

8253. If you tax some of the chief agricultural products, do you not think there will be a tendency to substitute other crops in their stead?—That will operate only to a small extent, because our farmers are slow to move, and even if a crop does not pay them they keep on cultivating it. For instance, they have been losing money on sugarcane for the last four or five years, and yet they stick to it.

8254. Have you any idea of the total amount that would be necessary for the Bombay Presidency?—I have no idea. I have had no time to look into it.

8255. Would you keep this money for the Bombay Presidency only?—That is also a point on which I cannot give an opinion.

8256. How many ports have you got in the Bombay Presidency? Only two, I suppose, Bombay and Karachi?—Yes.

8257. And the exports from those ports do not come entirely from your Presidency. You will be taxing other parts of India if you levy an export duty at those ports?—I would not like to appropriate money belonging to other Provinces.

8258. But how will you arrange for its distribution?—I expect its apportionment can be arranged quite easily. It should not be difficult to ascertain what amount has been transported by rail from other Provinces to Bombay.

8259. Would enlightened Bombay opinion be on your side in this matter? You are probably aware that in this controversy that is going on they are very much against the mulcting of the farmer to the extent of 12½ per cent.?—But the agitation has not stopped it; the action proposed will be taken, perhaps.

8260. You say something about Agra and Hathras, two places which I know myself, being in my constituency. What is the source of your information?—I got it from the report of the Boards of Agriculture at Pusa. The figures are in their last year's report.

8261. Do the villages near Agra and Hathras supply the milk to these two towns?—One agricultural graduate has organised the supply on his own account. It is only a small quantity.

8262. Have you been to Denmark?—No. I was in Ireland. I did not go to Denmark.

8263. *Sir Ganga Ram*: You said you were educated in America?—No, in England, but I spent four months in America.

8264. *Sir Henry Lawrence*: You were educated in India?—In India first and then in Scotland. I spent three years as a student at the Kilmarnock and West of Scotland Agricultural College.

8265. *Dr. Hyder*: What are the chief products of Danish agriculture?—Butter and bacon.

8266. And would you like to follow that example here and put the whole of Khandesh under dairy farms?—We can introduce milch cattle; we may not be able to make butter, but that does not matter, we can make *ghi*.

8267. Would cotton pay more than butter?—If you combine dairying with cotton, the yield will be increased 100 per cent. There is a village called Nar near Cambay, where there are more cattle than men, and they have been doing this there for the last 30 years.

8268. What are they growing?—They are growing cotton as well as fodder, crops, and growing them in rotation, cotton and fodder crops like *bajri*. And there they have increased the yield of cotton by manuring. I would point out the importance to the land of the manure derived from the cattle. That aspect of the problem we have neglected so far.)

8269. They do not burn their cowdung?—No. They are very careful to keep the manure in good condition.

8270. They have not given up cotton?—No. They are growing cotton.

8271. You say something about these teachers in primary schools in the rural areas. You say that they are men of very low mental capacity. What is the initial salary of these teachers?—Rs. 15 to Rs. 25.

8272. What does a porter or a taxi-driver get in Bombay or Poona?—Rs. 40 to Rs. 50, but a man who is educated has no desire for physical work.

8273. Has it ever struck the public of the Bombay Presidency that if they do not pay their teachers more they will not get good ones?—The teacher is getting a better living than the farmer. Unless you help the farmer you cannot help the teacher. The average farmer gets less than the teacher; he prefers to go as a teacher at Rs. 15 a month. That in itself is a proof.

8274. But a low-paid teacher turns out very bad farmers? He gives the boys a distaste for their ancestral occupation, does he not?—Yes.

8275. *Sir Ganga Ram*: Does the teacher get his food for nothing from the farmers?—I do not mean that. I am only saying that the standard is low. It is all a question of how much we can afford to pay.

8276. *Sir Chunilal Mehta*: Have you any experience of the use of cinemas for agricultural propoganda?—I have not.

8277. You suggest that they are useful, but you are not speaking from experience?—I am not speaking from personal experience.

8278. You consider that the dual purpose animal, i.e., the cow, will take a long time to evolve?—Yes.

8279. Would you deal with indigenous cattle only, or would you have crossing?—I would have the indigenous cattle only for general purposes. The cross has only a limited scope near the cities. But there will be this difficulty. People do not care for the milk of Indian cow, even though its fat content is 5 to 5½ per cent.

8280. What milk do they want in cities?—In cities, I think, very few people demand cow's milk.

8281. Is that the case in the rural areas?—I think it is the same there. Only people like the Rabaris drink cow's milk in preference to any other.

8282. The Indian *raids* always recommend cow's milk?—It is a physiological question, but I personally believe that cow's milk may be better than buffalo's milk. I do not know whether there is any relation between the food of the Rabaris and their characteristics, but the Rabaris as a race are very intelligent and good-looking. They take a lot of milk and simple food.

8283. And also cow's ghi?—Yes.

8284. *Sir Henry Lawrence*: The milk of camels is better still?—Not from the point of view of developing intelligence; at least, that is the common belief.

8285. *Sir Chunilal Mehta*: Have you any knowledge of what is being done by the department in connection with *gorakshans* and *pinjrapoles*?—There is at least one *gorakshan* in Bombay which I know. The department have given them help and technical assistance to look after their work, and also some cattle for breeding purposes.

8286. Do you consider that that line of advance could be taken for the purpose of improving cattle breeds?—Yes. They have got a lot of money and if we can persuade them to take to that, it would help us tremendously.

8287. You will buy bulls from them and give them out on the premium system?—Yes.

8288. There is no other method of getting premium bulls now, is there?—The only other method is having Government farms, which are costly to maintain. We have to maintain them for at least one breed. The other method, which has not been successful in my opinion, is the system of giving help to private people or societies. But the private people, including the co-operative cattle-breeding societies, who have been getting this help, have not done much.

8289. Would you mind making your answer in regard to fencing in Gujarat more clear? Is fencing in Gujarat for cattle taken up because it leads to better breeding, or is fencing the result of the better animals that they possess?—I do not think they took to fencing for the cattle because they look after cattle individually. A good farmer sends his boy, or goes himself, and tethers his cattle on the border line of his field. I cannot say definitely what

it was due to, unless I go into the history in the past to see whether it was related in any way to that.

8290. Do the cultivators in Gujarat themselves look after their cattle?—Most of the cultivators do it themselves.

8291. How many cattle on the average does a cultivator possess, speaking from your knowledge of the tracts that you come from, say, Anand?—One or two buffaloes ordinarily, and where there is big holding they keep three buffaloes. On a small holding there may be one buffalo, one or two young stock; and one bullock or a pair of bullocks.

8292. Have they no cows?—No cows. The general idea with the people there is that the cows require grazing and freedom to move about. That is because we have not shown them anything better. We have not shown them that cows can be reared and fed in stalls and improved.

8293. You think the trouble is due to the wrong notion that cows require grazing?—Yes. Of course grazing will help, but it is not absolutely necessary.

8294. What are the causes of the failure of dairying and butter-making in Gujarat?—There are so many small merchants who do not care to produce in the best way possible. These people collect the produce in small centres and then they send it to Bombay. They use very bad transport vessels. Then they allow it to remain stale for a number of days to get more yield, and then it comes to Bombay or Ahmedabad, and here it is tinned and sold. No steps are taken to improve the quality. It is not possible to do so, because these merchants are most of them small men, and on account of competition they want to sell at as low a price as possible.

8295. Did I hear you say that the military farms are buying butter from the market?—They are not buying butter, but they are buying cream from some people.

8296. And turning it into butter of very good quality?—Yes.

8297. At page 537 you quote the example of a village near Cambay, and you say, "The improvement of dairy cattle will have a far-reaching effect on the production of crops, as it is the chief source of manure." What do you mean by that?—There are two points there. Dairy cattle are the only cattle that are fed intensively with concentrates, and these concentrates return most of the minerals to the soil. The cattle take only 25 per cent. of the potash and phosphates, and the rest goes back to the land in the form of manure.

8298. So that the better the breed, the more powerful will be the manure?—Yes. One cart-load of manure from well-fed cattle is equal to two or three cart-loads of manure from ordinary cattle.

8299. On page 529 you have quoted the example of the Pachora farmer, and you say that he gets Rs. 11 per acre. And you say, "If this land was rented out the farmer would have earned more than this." What would have been the rent of these 100 acres?—I think it will be Rs. 12 to Rs. 13 per acre for that kind of land. That is because the tenant farmer has no option but to take the farm; he has to find land somehow, and as there is keen competition he has to pay a high rent.

8300. Did this gentleman purchase his own land?—No; he has inherited the land.

8301. Has he calculated any interest on capital?—No, none.

8302. If he were to rent the land, the tenant who takes the land on lease from him will have to calculate the rent as one of his expenses?—Yes. The point is the tenant farmer gets only the wages for his labour.

8303. The average return is, say, Rs. 11 to the owner. He does not calculate anything at all for the capital value of his land. You say, if he rents it out he will get more, that is to say, the rent would be Rs. 12 or Rs. 13. That rent of Rs. 12 or Rs. 13 will have to be paid by the tenant, and therefore unless he (the tenant) makes more than that amount, he cannot afford to keep that land?—He does not make a profit, but he employs himself and he gets the wages that the landlord would pay to his labourer if he cultivated the land himself.

8304. The landlord does not work himself, but only supervises?—Yes.

8305. Does he calculate anything for his supervision?—No. The tenant gets employment for himself. Let us assume that a farm labourer is paid 8 annas per day as wages. If he leases land at the market rate he will simply get his wages for the days he employs himself and his family, and not get it at the market rate, but say 25 per cent. less than the market rate.

8306. When you submit the details to the Commission on both these items, as you are going to do, will you explain all these matters?—I shall.

8307. I think it would be very desirable because we want to get at the real facts in this case?—I would be able to give the figures for the second farmer, the figures for first are not available.

8308. Take the second case. You say that the price of the land was Rs. 200 to Rs. 250 an acre?—He purchased earlier when it was cheap. Now that land will cost about Rs. 300 to Rs. 400 an acre.

8309. It will give a return of about Rs. 25?—Yes. If the land was purchased and no interest was charged on the capital his income would be Rs. 38 per acre. I have taken the interest at 9 per cent. on the purchase value he has paid for part of the land. Part of the land is leased, and he has paid Rs. 20 per acre as the lease value.

8310. Did this gentleman have any agricultural knowledge before?—Yes. He is an agricultural graduate.

8311. Did I not hear you say that he had general education up to B.A.?—No, it is the first farmer who is an Arts graduate. The second is an agricultural graduate. After passing out from the College he purchased some land, and leased some land, and slowly built up his farm.

8312. Would he be an example of the average Ankleshwar farmer?—I have said that his income would be a little better. He has managed the farm in a better way than the ordinary cultivator. I have seen the farm.

8313. Would the ordinary cultivator possess 48 acres of land?—No. His average is, I think, in Broach, 17 acres. The average of the Bombay Presidency, including Sind, is 13 acres.

8314. *Dr. Hyder*: On that estate were any experiments made?—No. It was under ordinary cultivation.

8315. *Sir Ganga Ram*: Interest at 9 per cent. on Rs. 400 will be Rs. 36?—He has not to consider that; he has to consider only what he paid.

8316. *Sir Chunilal Mehta*: At page 531, you have shown the advantage of broad ridging. It seems to me to be a profitable thing to do. Has it been copied by the people?—No. We are just ready for it.

8317. You have not had any propoganda about that yet?—No. This has been applied only to two crops, turmeric and ginger, and it is followed to a certain extent for sugarcane. But it could be applied to other crops.

8318. Then, about implements, you want manufacturers like the International Harvesting Company to come and start factories in this country. Would they have then to pay any duty on the steel they used?—I did not look at it from that point of view. My only point was to attract the expert knowledge for the work. How to do that is left to the statesmen.

8319. Do you know what Kirloskars are doing in this matter at present?—They are doing something, but they have only a poor copy of these western implements. They are making ploughs and all sorts of implements. They have sent two or three men to Germany for training. If I may say so, even some of the English firms are not producing the type of implements which are made in America, so I do not think the Kirloskars will get their training or technical knowledge for years to come.

8320. But they have applied themselves to it?—They have sent two or three men abroad and they have studied engineering.

8321. Do you know that Kirloskars have such an amount of demand for their present implements that they have not cared to study the conditions of the market?—I do not know that. It may be because of the cheapness of their implements; but not on account of the quality.

8322. They are considerably cheaper. Their ploughs cost Rs. 30 as against Rs. 60? Rs. 30 against Rs. 65?—The Krupp Factory Agent gave me to understand the other day that he would be able to put his implements into the market at the same rate. I do not know how far he will be able to do it, but they make separators much cheaper than any other firm.

8323. Are there any competitors of Kirloskars?—One factory has been started, and only after that competition did they reduce their prices.

8324. Is that quite correct?—I think it is.

8325. What was the price of the Kirloskar ploughs the year before last?—The price was higher before there was competition.

8326. Have you got the data, the prices during the past years?—I think I can give them* because on the college farms we used to purchase them.

Sir Ganga Ram : It is true, he told me himself he had reduced the rates since there was competition.

Sir Chunilal Mehta : I was only trying to get from you what you really meant when you recommended that foreign firms should be induced to come here and start factories.

8327. On page 536, you say " Perhaps, if we start a milk control society in the Bombay Presidency we may find our cattle worse." Will you please explain that?—Ordinarily, I have taken it that there will be a yield of 2,000 lbs. per animal per year, but actually if we go into the investigation, perhaps there may be some of our cows which would give less than that; it may come to 1,500 or 1,800 lbs.

8328. What is your point there?—The point is that the cattle are actually causing loss to the farmers, and unless we improve them we will not be able to help these farmers.

8329. What is a milk control society?—It is a milk recording association; a milk control society is the same. Different names are used in different countries.

8330. On page 538, you speak about what you call subsidiary occupations. You have combined spinning and weaving there together. Is that your intention?—Yes.

8331. How would you have it worked? Would you have both hand-spinning and hand-weaving?—Yes.

8332. Would you say that the hand-weavers must only use hand-spun yarn?—There are advantages in that; it gives more employment. If we can find better employment than spinning, by all means do it.

8333. I was trying to separate the spinning from the weaving. Have you examined it from that point of view, or are you here talking of hand-weaving necessarily using hand-spun yarn?—Here I take it up from the point of view of giving maximum employment and spinning, of course, does give more employment, of course, at a lower rate of wages. But if a man does only weaving, he will produce a large quantity, more than he wants, and then the question of marketing and the purchase of yarn will come in, which will complicate the question. The question of supplying yarn at a certain time and disposing of the produce will be more complicated.

8334. Do you know if the cultivators do weaving themselves?—I do not know. In some places they do.

8335. For instance, in Gujarat?—On the Kathiawar side it is a new introduction.

8336. I am speaking of Gujarat, in the parts that you are acquainted with?—Some people will not do it. The Charotar people will not do it. They have got perhaps a higher standard of living, and as long as they get enough to live upon, they will not do it.

8337. Have they got the time to spare?—Plenty.

8338. How do they utilise it? Doing nothing?—Perhaps creating mischief in the villages.

8339. You have not really studied this question of hand-weaving as a spare-time occupation for the cultivators?—Not from that point of view, because there will be an organisation required.

8340. This is a suggestion that you make?—Yes.

8341. I see that on the next page you suggest that this is a line of enquiry which might very suitably be taken up?—Yes.

8342. That is all the extent of your experience and that is what your knowledge leads you to say?—Yes.

8343. On page 539, with regard to the welfare of the rural population, you say, "I would suggest that district non-official organisations for all sorts of social service in villages may be encouraged." Will you please amplify that a little?—If there is any local organisation which is employing workers who are qualified and enthusiastic and who are prepared to stand the rural life, and sacrifice their time even at the cost of their earnings elsewhere, or take only small wages, I would help them from the State coffers.

8344. In what way?—If they spend say Rs. 1,000, I would suggest a grant of Rs. 2,000.

8345. To whom would you pay the grant?—To the constituted authority of the society.

8346. How are they to spend the money?—They will lay down a programme, and they will employ organisers who will go round and take up co-operative work and better farming, and they will warn the farmers against litigation, and do what they can in improving their health, etc. We are contemplating an organisation in Charotar. We have got Young Men's Unions in about 100 villages, and we are trying now to work this up and see what work can be done by these people. There has been some collection of funds locally. They have got one day in the year when they get Rs. 400 to Rs. 800. They have got physical training classes and so on.

8347. Has this society been working at all so far?—There is no society as such started. This is just informal work.

8348. Will the young men be prepared to live in the villages?—Yes. Now there are a lot of people who have a desire to work in the villages: but they want guidance, training and perhaps help.

8349. You think such men could be found?—I think so. It is a question of leadership. If I am drawing a big salary, and were to talk to them, they may not listen to me. But another man, who has done some self-sacrifice and who has a very good personality, may get the men.

8350. You consider some organisation of this character necessary for general rural uplift?—I think so, and this method will be the cheapest for the State.

8351. *Sir James MacKenna*: You are Professor of Agriculture in the Poona Agricultural College, Mr. Patel, a post of very considerable responsibility. I wonder if you would be good enough to tell the Commission what your educational training has been. It has a hearing on the training of Indians for these higher posts?—I graduated at the Poona Agricultural College. I then got a University scholarship, and I went to Scotland. I studied at the West of Scotland Agricultural College for two years, and got my Diplomas in Agriculture and Dairying. Then I put in about five months in Ireland, studying the co-operative movement there, and then I put in about three or four months in England studying the question of milk supply. I then spent some months in America studying the question of milk supply. Then I returned to India and took up a job with the military dairies as cheese

expert for 16 months, and made cheese for the troops. Then I started a joint stock concern to supply milk to Ahmedabad city. There I was almost promised the land for which I had applied to the Bombay Government. I did not get the land and so I had to give that up, and took to some business for a year or so in Manchester, in other line than agriculture. Then I accepted this offer which was made to me.

8352. You came back as Professor of Agriculture?—No. Originally I was meant for the post of Deputy Director of a district. Then I came here, and as they had no post to offer me, they offered me dairying work at the College, and then when the vacancy arose, I was appointed Professor of Agriculture.

8353. *Sir Ganga Ram* : What pay do you get now?—Rs. 700.

8354. *Sir James MacKenna* : You are in the Imperial Agricultural Service?—Yes.

8355. Judging by your own experience, would you say it has been a very good training for the post except for the interval at Manchester?—Yes.

8356. What do you think would be the best training for an Indian gentleman who proposes to get to a post like yours?—He must have training in one of the Indian Colleges to begin with. Then, if you want a man for research or demonstration work, it will be better to put him on practical work for a couple of years and get him into touch with local conditions, and then send him to any place where he can take up a special line to his best advantage.

8357. To England, Scotland or Denmark?—Or America.

8358. Anywhere abroad?—Yes.

8359. For two or three years?—For at least two years.

8360. You emphasise the desirability, after having his degree here, of his putting in a couple of years in practical work before going anywhere else?—Yes.

8361. What do you think about the training of Indians for the service generally? You know that the Indianisation of the services is progressing rapidly. What about a Central College training for post-graduates in India?—I personally think that post-graduate training should be in actual practical work.

8362. Two years on a farm?—Yes.

8363. You prefer that, combined with training in a special subject in Europe, to special post-graduate training out here?—Yes.

8364. *Professor Gangulce* : Under the head of Research, you separate the administrative work from the research work, do you not?—To a certain extent, but I do not give separate powers to the two Directors.

8365. Administrative work, you suggest, ought to be in the hands of an entirely different man?—Yes.

8366. What rank of officer? Would you like to have an I. C. S. officer in charge of administration?—It is not necessary to have I. C. S. officers for this. Agricultural officers will be preferable.

8367. On page 539 you complain, if I understand it aright, that you do not get under-studies. Is that what you mean?—It is rather a general complaint of high authorities in India, that when these experts retire or leave the service for better jobs, they have nobody to take up their work and continue it.

8368. You have an Economic Botanist in your department?—Yes.

8369. How many men are trained under him?—There has been a number of men who have put in work in connection with grass and other researches.

8370. Any cotton-breeding experts?—As regards cotton-breeding, they got only general training in the beginning, but now they are being trained. These people are not put directly under the Economic Botanist; they are put outside in the districts where the cotton work is going on for training.

8371. But directly under your Economic Botanist you have no men being trained in Economic Botany?—There are three or four men, who are doing,

one grass work, another a study of weeds, and another some fruit work. These men are trained under him.

8372. So there are under-studies being trained?—Yes.

8373. You make a reference here that not a single Indian member from Bombay Presidency has been nominated to the Board of Agriculture. Did you bring this matter to the notice of the Director of Agriculture?—No. If you take the history of a number of years, there has not been a single member so nominated.

8374. Did you make a complaint of it, or bring the matter to the notice of Government?—No, I have not done so.

8375. What are the subjects that you teach in the Agricultural College?—On the whole, we teach Botany, Chemistry, and under Agriculture we have Geology for soil study and Soil Physics.

8376. Do you teach all these subjects?—No. I myself teach Dairying and Farm Management. Those are the chief subjects. I taught Agricultural Economics for a couple of years.

8377. *The Chairman* : You do not teach that now?—No.

8378. *Professor Gangulee* : Do you carry on any research?—We have got some research on implements and tillage under me. Personally, my work is so much of a routine type, that there is hardly any time left for other work.

8379. Your main subject is dairying?—Dairying and Agriculture.

8380. 'Agriculture' is a vague term; I want to know definitely the subject you teach?—Dairying and Farm Management.

8381. Is it the economic aspect of farm management or the tillage aspect of it?—It is the economic aspect.

8382. With regard to this dairying work, you are not carrying on any research on dairying?—No, except the question of running a dairy on commercial lines, to produce fodder in the cheapest way and to dispose of the milk in the best way possible, and the question of feeding and so on.

8383. You say that the digestibility of the local foods is a problem which has not been taken up. Has it not been taken up at all by the Provincial Government?—No.

8384. Have you taken up any work in that direction yourself?—No. There are no facilities and no staff.

8385. Are you in touch with the animal nutrition work going on in Bangalore?—No, I have not had the opportunity of seeing it.

8386. Do you send any of your feeding stuff there to be analysed?—I think the Livestock Expert has sent some feeding stuff, but it is a question of the particular type of animal.

8387. I quite follow that. Do you teach here Animal Husbandry?—Yes.

8388. So far as this question of nutrition is concerned, your teaching is based on text-books?—Yes.

8389. There is no practical work?—No, except that you deal with dairy management problems. That is practical.

8390. So the boys trained in your college will not get any idea of the digestion co-efficient of the feeding stuff of this Province?—They will not.

8391. Do you recognise the fact that the whole question of economic feeding of cattle depends on finding out the digestion co-efficients of Indian feeding stuffs?—Yes, it does.

8392. In answer to the question on agricultural education, you suggest the formation of a board of education. The matter has been already referred to. What would be the function of this board? Have you anything definite in your mind?—To fix the curricula; that is what I have kept in view here.

8393. No administrative direction?—No. I have not gone into the administration at all, but it will be necessary to have some arrangement to carry out this.

8394. Would you set up this board under the Minister of Agriculture or under the Minister of Education?—It will be the Minister of Education as it stands, the Education Department; but I should say that it should be a combination of both.

8395. You feel the necessity of the co-ordination of these two departments under central direction?—Yes.

8396. With regard to these figures that you have given about the Broach farm, what is the standard of cultivation? You do not say anything about it?—It is a little above the average. It is cultivated fairly well. In Broach district the farmers are farther advanced than in any other district in the Bombay Presidency.

8397. Could you give us any idea of the present value of this particular land?—Rs. 300 to Rs. 400 per acre.

8398. Could you estimate the percentage increase in value?—He paid about Rs. 200 to Rs. 250 per acre.

8399. And now the value will be Rs. 300 per acre?—Yes. The increased value is not due to improvement only; it may be due to the general rise in the market.

8400. Nothing to do with the land itself?—No.

8401. On page 530, you suggest greater control over the expenditure of loans. Could you tell me whether such control will lead to the development of the co-operative spirit?—It will be a handicap. But I do not want to give them a long rope to ruin themselves by giving them credit for non-productive purposes. The greatest complaint I make is that unless they know how to spend their money I do not think we can help them very materially.

8402. But control of the nature that you suggest would sterilise their co-operative spirit, would it not?—I do not think so. They have already control in the co-operative credit societies and banks.

8403. Of some sort, yes. With regard to animal husbandry, what is the basis of your selection in the cattle-breeding carried on at the Poona Agricultural College?—We have not got cattle-breeding as such on the farm.

8404. You have a livestock experiment?—Yes. On the farm, we have got Sindhi cows and Surti buffaloes, and we have got milk records, and from milk records we select the best animals and serve them with the best bulls and I am going to try in-breeding to get those characteristics fixed.

8405. Have you developed a system of recording?—We have.

8406. And of grading the stock?—Grading the stock by keeping the better bulls. We are selecting from our own.

8407. You consider grading and recording are fundamental requisites to the intensive work on breeding that you want to propose here?—Yes.

8408. Then, on the question of the city milk supply, you say that the system of city milk supply is slowly but surely sending the animals to the slaughter house. Could you develop this?—In Bombay, they bring the milch cattle from outside. They purchase them from Delhi as well as from Northern Gujarat, and these animals are kept for about ten months for milking. When they get to the stage when the animal produces about 5 lbs. to 6 lbs. of milk daily it does not pay them to keep it, and they sell it to be sent to the slaughter house.

8409. *Mr. Calvert*: What price does the animal fetch?—It fetches about Rs. 60 to 70.

8410. Are they not covered to this period at all?—No. If they cover them, they have to maintain them for five or six months, and it does not pay to maintain them in Bombay conditions. They have a method by which they do not allow them to dry up. They want the maximum amount of milk from them. They do not cover them. They are sold for slaughter as there

is no better customer for them. Under the conditions in Bombay the keeping of cattle is so costly, that they must keep the best animals, and they get the best animals from the district to meet this fate.

8411. *Professor Gangulee*: This system, you consider, is a drain on the selected animals?—Yes. In foreign countries they select the best animals for breeding; here they select them for killing. It comes to that.

8412. Have you brought this matter to the notice of the authorities?—It is a well-known fact.

8413. Have you gone into the system in detail?—I cannot go into it, because the Livestock Expert has gone into it.

8414. Has the matter been placed before Government?—I cannot say, but he put up proposals for an experiment to put these cattle back. But that was all. It has been very closely studied from the milk-supply point of view by the municipality and by Dr. Mann also. All these people know what is happening.

8415. What remedy would you recommend? Have you any suggestions to offer?—Yes. The milk must come from outside. There must be an organisation for supply of milk by railway. That is the only remedy as far as this is concerned, and then all the benefit of cattle-keeping can be given to the tract, right up from Bombay to North Gujarat.

8416. In what you say on page 538 you were inspired, I suppose, by literature from Japan? You suggest here the organisation of Young Men's Unions in villages. The problem is to find the young men, is it not?—Yes.

8417. Do you know of any students of your Agricultural College who have spent their vacations in educational propaganda of this nature?—I know a graduate who is doing this work.

8418. One graduate?—Yes. But, as I pointed out, unless I give up my salary, I cannot create that spirit. But we are going to create it in a separate institute. Some of these students have come in contact with self-sacrificing people and have been inspired by this enthusiasm, and we have a couple of men ready to undertake this work.

8419. Do you think mere enthusiasm will carry them far?—Yes. They are going to be trained for the job they are going to do.

8420. Where?—For agricultural purposes, we propose training them at the college and very likely sending them abroad.

8421. *Mr. Calvert*: With regard to exports, have you any idea what proportion of the total gross production of Bombay is exported?—I do not know anything about it. I only threw out a suggestion; I have not studied the thing.

8422. You talk about the students of the Poona College not having large farms. We were told that 22,000 holdings in this Presidency are over 100 acres. Do you not get the sons of those owners?—We had about five or ten of them. As I have pointed out, renting pays them better than working themselves. The little difference that is there is not enough to induce the man to go in for private farming.

8423. Renting pays better than management by a graduate?—Yes. I have given the figures. Even with practical men it is the same. It will be the same for graduates.

8424. Does not that point to a defect in the college training?—No. The defect is that we have not been able to improve agriculture by 100 per cent. over the farmer's methods. I may call it a defect of the whole science of agriculture. They have not yet been able to produce more than 20 per cent. or 30 per cent. more, and that is very little when you take a small holding, and even for a fairly big holding of 100 acres. We take it that a graduate expects Rs. 100 a month or Rs. 1,200 a year at least, and if he can make only Rs. 5 per acre by doing his own farming, he must have at least 240 acres of land.

8425. In England, that is not a very large farm?—No. We are not living in England. At present, here, we have to deal with farms of 13 acres.

8426. Do you know if you have in Bombay any middlemen who take land on lease from big owners and sub-let it to smaller men?—Not ordinarily. They may do it perhaps on a large scale, but I do not know of it.

8427. This postal savings bank proposal is a fairly old idea. Do you not think that cheap money like that would rather stifle self-help?—If we can keep control, which is possible through the co-operative banking organisations, every item of loan should be gone into in detail, and unless we do that any kind of credit, whether cheap or otherwise, will have the same bad effect. I do not think a little cheapness will have a great effect. But this cheapness will help in this way. My study shows that the farmer only gets labouring wages, and if he has to pay interest at 12 or 15 per cent. or even 9 per cent. when he must lose and he must pile up his debt. If we can give cheaper money, it will help him to develop his agriculture.

8428. Do you not think that the best way to get cheaper money is to save it up?—Certainly; I lay very great stress on the fact that they should cut down their expenses.

8429. On this question of milch cattle not being profitable, I gather that ordinarily the birth-rate of cattle exceeds the death-rate?—Yes.

8430. Therefore, if you are slowly introducing a better milk-yielding animal, when that animal reaches the milking period it must displace the poor one, and the great problem is to eliminate the poor animal?—Yes.

8431. Can you suggest any means which would be acceptable?—I think the only means is that we must improve the productive capacity of the animal, and then it will look after itself. I studied some data with regard to cattle in times of famine, and I found that the greatest care is given to the bullocks first, and the milch buffalo comes second in importance, the cow comes third and last come the young stock; they die most and the bullocks die least. This shows that the farmers realise that bullocks are absolutely necessary to look after; next comes the buffalo if she is in milk, and he looks after her. Unless, therefore, we improve the productive capacity of this animal, I do not think we can persuade them to look after the animals or select the animals.

8432. The point is that if you are breeding the better milk-producing animal that animal will require more food?—Yes.

8433. We are told that the grazing grounds are already over-stocked?—Yes, but over-stocked with useless animals.

8434. The difficulty is that you cannot eliminate the useless animals without giving offence?—Automatically they are eliminated; people do not send them to slaughter houses, but indirectly they do go to slaughter houses. Of course the people have religious objections, and they do not realise that they are wasting a large amount of money to no purpose in famine and other times. Ultimately these animals have to go to the slaughter house. It is a question of the education of the public. Free grazing is in a way helping the cultivator to keep as many cattle as he likes. People should realise that better feeding is necessary.

8435. It is a difficult question. You say the average holding is little more than 13 acres; but holdings of 5 acres comprise from 38 to 64 per cent.?—Yes.

8436. Does not that point to a great waste of bullock power?—These people do not keep bullocks; a man with a small holding will keep one bullock and co-operate with another farmer; that is the ordinary thing except where the bullocks are so cheap or are too small. Ordinarily they do not keep a pair of bullocks for every type of holding.

8437. You say a pair of bullocks will control 20 acres?—Yes.

8438. Will that be so with regard to these petty holdings?—No; that is the average; where people have got 20 acres, they keep a pair of bullocks. Many of the petty holders do not keep any bullocks, but depend on hiring.

8439. What class of people object to poultry rearing?—If you take the whole of Northern Gujarat or even Southern Gujarat, the Hindu population will not keep poultry; all the farmers are Hindus. The Mahommedan farmers will keep them, but others will not. In the Deccan all the Maratha farmers will keep them, so that the Deccan is a good place for poultry-rearing.

8440. The objection really is to eating them?—Yes, and to keep them for sale for killing; they will not keep them because they know they are going to be sold for killing.

8441. They will not even keep them?—No.

8442. *Mr. Kamat*: With regard to the suggestion which you make as to an export duty on grain, do you really mean that there should be a fund of this character for each Province or an All-India fund?—I meant for each Province. Perhaps it might be better to have an All-India fund.

8443. You were asked whether if you levied an export duty on wheat going out of Karachi or Bombay you would not be taxing people other than the Bombay people. Were you thinking of an All-India export duty or an export duty with regard to a particular Province?—I was thinking of a provincial duty.

8444. *Dr. Hyder*: But can you separate the provincial exports from the exports of other Provinces?—The money made from the wheat control during the War was distributed to the different Provinces, and there are ways if it is desired to do so.

8445. *Mr. Kamat*: Probably you have not thought out this question from the All-India point of view at this stage?—No.

8446. With regard to your general conclusions as to the education of agricultural graduates, you say that the uneconomic condition of farming is really the chief cause of farming not being attractive to agricultural graduates?—Yes.

8447. And you have given certain instances; that is to say instances where agricultural graduates have not been able to do any successful farming. Do you know of any positive instances of men who have been successful in certain parts of the Presidency?—No; I have not got the data; you see the difficulty is that many people do not keep the data that we want.

8448. Therefore you are now generalising on insufficient data?—No; I will not say that. It is true that it is an individual case, but it coincides with our experience and practical knowledge. Personally, seeing these things and knowing the people and their capacity, I can fairly say that it is not owing to mismanagement that these people have failed.

8449. Do you mean that given all facilities, land, water and capital, an agricultural graduate cannot make farming any more successful than an ordinary farmer can, except for the small margin of rent?—You see farming is not merely science; farming demands a great deal more practical knowledge. I do not think the Agricultural College professes to train farmers; it trains men who with further practical training may be capable of farming.

8450. Is it your view that these men have the scientific training but have not the practical experience?—I say that if you put the best man on to the job he will never get Rs. 1,200 unless you give him a size of holding proportionate to the economic conditions. There is another aspect of the matter; if a man has so many acres of vegetable farming or sugar he has a chance of making Rs. 1,200 or Rs. 1,000. If he has to buy his land it will never pay him.

8451. Then, apparently, your view is that farming is hopeless even when done by a man who has the scientific knowledge of an agricultural undergraduate; it therefore follows that the ordinary farmer cannot be blamed for

his improvidence or his waste to which his failure is sometimes attributed?—No; there is a vast difference; the farmer has one great asset and that is his labour. That asset counterbalances every asset which the educated man has. The farmer has another asset, that is his standard of living is low, while the educated man's standard of living is high. If we put an educated man into farming I would suggest that he should be educated up to the 5th or 6th standard of the Anglo-Vernacular School, and then if up to the Matriculation you give him good agricultural education, he will be able to work physically as well as be able to make use of his greater knowledge.

8452. Apparently the sum total of all the advantages and disadvantages is this, an agricultural graduate is not able in your opinion to make even Rs. 100 a month?—He cannot make it because of the physical factor; it is not due to his lack of knowledge.

8453. If that is the condition of things, why are you recommending secondary agricultural education? Will that attract pupils?—Yes; there is no difficulty in attracting pupils; 80 per cent. of them go back to the land; they have no other means of living; whether they wish it or not they have to return to the land. The man of the high school standard is content with Rs. 40 a month, but the agricultural graduate who has spent Rs. 4,000 or Rs. 5,000 on his education and who has been living on Rs. 50 a month in the college for five years requires that money in his after-life.

8454. Do you mean he should be content with Rs. 40 a month?—I do not mean that at all. If a man has no means of living he will not undertake this study and he will not go to an agricultural college, just as an ordinary man will not go to an arts college when he finds that it does not pay.

8455. I understand you want to convert these middle schools of the Loni type into training schools?—Yes.

8456. Is that because vocational agricultural training, in your opinion, is not sufficiently attractive?—No; I have suggested a new scheme, and these schools can be fitted into that scheme as training schools. In the new schools we are giving the type of education which will give the pupils a taste for agricultural work. We are giving them practical work as well as knowledge about agricultural problems; they will be able to farm successfully, because their standard of life will not be so high as that of these other people.

8457. From your experience of the Deccan, do you think dairying can be made a fairly successful business in the Deccan?—I have no experience of the Deccan dairy districts, and as far as my statistics go there are only one or two places where they have got enough cattle from the dairy point of view. The Deccan farmer does not understand the care of animals at all.

8458. You say in Khandesh it could be made a profitable industry?—Yes.

8459. That applies only to Khandesh?—Khandesh has the particular advantage that the soil is lighter and cotton and fodder crops are grown. In the Deccan it will be very difficult unless they learn how to look after cattle and associate dairy farming with general farming.

8460. So that all your remarks with regard to co-operative dairying so far as Gujarat is concerned do not apply to the Deccan except the district of Khandesh; is that right?—Co-operative dairying does not apply even to Khandesh, because the material does not exist at present.

8461. We were told that cattle-breeding was not a subject upon which one could be optimistic; you are now telling us that we cannot be optimistic with regard to the future of dairying in the Deccan; is that correct?—It has a future, but the point is it cannot succeed unless we produce economic cattle.

8462. I understand that out of this competition between the cow and the buffalo you hope to evolve a type of cow which will really be an economic animal?—Yes; it is possible.

8463. How long, in your opinion, will it take to evolve such a type of cow?—It will take a long time; it is therefore all the more desirable that we should start early.

8464. What do you mean by a long time?—If we go on at this rate it may take 200 years before every farmer replaces the ordinary animal with a better animal.

8465. And until that event you think dairying is not a very hopeful occupation?—It is a cottage industry. As in the case of the poultry, dairying gives more work; it provides milk for the use of the cultivator and his family; it utilises all the fodder that otherwise would have no market; but the manure is the greatest item; the manure will add to the production of every crop.

8466. You think it will be a purely cottage industry?—Yes.

8467. On the last page of your memorandum you complain that so far as the Indian officers of the Agricultural Services are concerned they are not treated well in the matter of free passages for leave abroad for study purposes?—Yes.

8468. Will you just indicate to us what you have at the back of your mind?—I am not putting this forward as a complaint, but if the State wants to get the best service from these officers I feel that it would be preferable to compel them to go, because many of them are not willing to go. If the State facilitates their going it will increase their efficiency. Other classes of officers have the chance of going abroad.

8469. Do you mean that at the present moment if these officers want to go abroad, they are not allowed to go?—That may be because funds are not available.

8470. Do you mean that on the ground of finance they are not given sufficient opportunities to go?—That is true.

8471. And you desire to establish a system by which Indian officers should be made to go every five years?—Yes.

8472. *Dewan Bahadur Malji*: You have only given two instances; one was from Pachora, and another from the Broach district, as to the size of the holdings?—Yes.

8473. Are you satisfied that the results show a sufficient margin of produce?—No.

8474. In those circumstances do you think agriculture is a paying proposition?—Yes. The peasant farmer earns his wages, not at the market rate but 25 per cent. less; that is my personal experience. It is only in that way that you can call it successful.

8475. *Mr. Calvert*: Do you mean 25 per cent. less for the days he works, or 25 per cent. less for the whole year?—No; for the days he works. I am not taking the whole year. The ordinary holding is so small that he must have a secondary industry if he is to earn the minimum for his family.

8476. Otherwise he only earns a day's wage?—Less than that, because according to my estimate a twenty acres farm will employ a man fully for the whole year round, 320 days.

8477. *Dewan Bahadur Malji*: The instance from the Broach district is from Sajod?—Sajod, yes.

8478. In that village did you find that the cultivator had his own bullocks?—He had his own bullocks.

8479. Did you deduct the charges for that?—The cost of keeping the bullocks has been taken into account.

8480. The only thing you have not deducted is his own supervision charges?—I have allowed nothing for that; all other expenditure has been allowed for.

8481. Have you made any deductions for the implements of husbandry and their upkeep?—Whatever he normally spends has been taken into account, and we have allowed for interest and depreciation of the implements at 10 per cent.

8482. On page 530 you refer to the rate of interest on loans given to agriculturists and you suggest that *taccavi* loans and loans through societies should be at a lower rate of interest than at present?—Yes.

8483. Do you advocate the investment of a part of the premium levied by the various insurance societies from abroad?—I have not made a study of it, but I would suggest that the State should make use of any sources. There may be a stage later on when it may not be necessary for the State to help, but at this stage a certain amount of help is necessary.

8484. The premia received are very large; are they not?—I cannot say.

8485. Do you know that in America and elsewhere they are as a matter of fact compelled to invest a part of such premia in co-operative and agricultural business?—I do not know.

8486. Would you be in favour of that idea?—If it is possible, it certainly should be done.

8487. How many breeding farms are at present run by Government in this Presidency?—About three farms belong to the Government.

8488. I understand you want many more?—Every breed must have a farm; I think we have got that at present; but my point is that we have not decided whether our ideal is to be the dual purpose animal or merely multiplying the best animal that we have got.

8489. What means would you suggest for demonstrating to the people the results of good breeding?—I think we should aim at dual purpose animals because in certain tracts I find that the cows multiply, and the same amount of fodder is used to keep the increased number of cattle. The result is they are not fed properly. That is because the cows give no milk; even if they were given away free no one would take them.

8490. Are there proper arrangements for grazing?—There is grazing, but they do not depend altogether on grazing. Grazing alone will not suffice. If we are to give the land to grazing it would be uneconomic, because cultivated land gives twice or thrice as much fodder as the same land left to grazing. If an acre of land is left to grazing it will give about 2,000 lbs. of fodder, whereas if you sow it with *juari* you may get 5,000 or 6,000 lbs. of fodder.

8491. You have seen the military farm at Dharwar?—Yes.

8492. Do you not think that people would soon take up dairy industry if they were satisfied of its success?—Yes. It is very difficult to start; if we had an assured market for three or four years, there would be no difficulty.

8493. Do you not think the results of the Anand dairy ought to be published far and wide if the dairy industry is to be introduced in that part of the country?—It is not work done on business lines so far as I can see at present.

8494. With a view to developing this industry, would you suggest that military dairy farms, if not entirely required for Government purpose, should be worked on some such lines?—Yes.

8495. To be held out as a model?—Yes. I think that would be desirable. If it were worked properly and we get the co-operation of the Military Department, I do not think the State would lose a single pie.

8496. As at present carried on, practically the whole of the work is done privately?—There is not much secret about it.

8497. Are people admitted to the farm?—Anybody who wants to see it is allowed to come in.

8493. Do you not think it is necessary that a record should be kept of the future careers of the graduates of the Agricultural College?—Yes; we have some sort of record.

8499. Is a regular register kept?—It is now, but not from the beginning.

8500. Is it studied from time to time?—Yes, it is; but it is very difficult to keep in touch with the students.

8501. Is it not possible by correspondence?—They may not answer our letters.

8502. *Sir Ganga Ram*: You are getting Rs. 700 a month now. Supposing land of the quality of which you have been speaking was offered to you, you had to pay Rs. 5 an acre as rent, and all the capital were lent to you at 6 per cent. interest, for how many acres would you exchange your present position?—I wanted to do that; that was why I started a dairy at Ahmednagar; there were 1,300 acres of land there; I wanted to develop the dairy industry and milk supply of the city, but I could not get the land. I asked for the land as a concession.

8503. As a matter of business, for how many acres would you exchange your present position?—Land in the Surat district?

8504. No; land in the same position and of the same character as that of which you have given details?—That is in Broach.

8505. Yes; wherever it is?—Do you mean if I get Rs. 23 margin per acre?

8506. Do you mean you get Rs. 23 an acre by intensive cultivation?—It can perhaps be increased to Rs. 35.

8507. Have you any objection to teach these matters to your students?—No; I am teaching them these things.

8508. Are you teaching them how they can make Rs. 23 an acre?—I am teaching irrigation farming at the college by which more money than that can be made.

8509. You advocate dairying. Will Hindus do the dairying?—Yes; it is only Hindus who are doing it in the Bombay Presidency.

8510. Do they sell to the butchers?—No; they do not.

8511. Then, what do they do with the cattle?—Buffalo bulls die a natural death, possibly by starvation.

8512. What happens to the cows?—The cows are not kept here by ordinary farmers.

8513. They only keep buffaloes?—Yes.

8514. The calves are disposed of by starving?—No, the buffalo bull calves that are of no use for farming die a natural death by starvation.

8515. *Sir Henry Lawrence*: You said the Hindus in Gujarat would not take up poultry-farming?—Yes.

8516. Does that apply to the Dharalas?—No.

8517. Does it apply to the Bhils and the Kolis?—It does not apply to the Bhils. The Dharalas are lazy as a class in my opinion.

8518. There is an objection to keeping poultry for slaughter?—The Dharalas would have no objection.

8519. What proportion of the population are Dharalas?—I could not say.

8520. Are they 30 per cent.?—I do not know.

8521. Would the Dharalas, Bhils, Kolis, and Mussalmans, all told, comprise 30 per cent. of the population?—Yes; it would be a large proportion of the population.

8522. *The Chairman*: Is there a shortage of agricultural labour in this Presidency?—I would not call it a shortage; the farmers experience a shortage simply because they do not work themselves; as soon as their position becomes a little improved they want hired labourers. That is the difficulty; they want to avoid working themselves.

8523. What is your opinion of the introduction of labour-saving machinery as a general principle?—Labour-saving machinery as such would be in the interest of a certain type of farmer; by that means he would get cheaper labour. But I would not consider it to be to the advantage of the majority of the farmers. On the other hand, if it increases efficiency from the productive point of view, then it will help every type of farmer.

8524. You distinguish between labour-saving as one factor in efficiency and other factors in efficiency?—Yes.

(The witness withdrew.)

APPENDIX.

Statement showing the prices of the Kirloskar Ploughs Nos. 9 and 100 for the last 11 years.

Year.	K. P. No. 100.	K. P. No. 9.
	Rs. A. P.	Rs. A. P.
1915-16	33 6 6	40 11 3
1916-17	43 12 0	46 14 3
1917-18	43 12 0	52 0 0
1918-19	43 12 0	52 0 0
1919-20	70 6 0	74 0 0
1920-21	70 6 0	74 0 0
1921-22	59 0 0	64 0 0
1922-23	30 0 0	33 0 0
1923-24	34 0 0	37 0 0
1924-25	34 0 0	37 0 0
1925-26	30 0 0	33 0 0

**Rao Sahib BHIMBHAI M. DESAI, Deputy Director of Agriculture,
Gujarat, Surat, Bombay Presidency.**

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION—(i) The number of vernacular agricultural schools is insufficient. There should be at least one such school in each district.

(iii) Yes, as far as possible.

(iv) Yes.

(v) (1) if the education is perfect and interesting;

(2) if the lad after going through the course can earn his livelihood independently or is able to secure some employment.

(vi) Yes, to a greater extent.

(vii) The present courses do not suit the wants of rural population. On the contrary, they have induced the farmer to leave his farm and go seeking other occupations in towns and cities. In short, the rural education should have agricultural bias in all elementary schools; that agriculture should be one of the compulsory subjects in all middle and high schools; that agriculture and rural economics should be kept as optional subjects in all the arts, engineering and forest colleges, and that post-graduate teaching in agriculture should be introduced in the agricultural colleges of each Province.

(viii) They are all important adjuncts for creating interest in agriculture to growing children, if funds allow.

(ix) The majority of students have taken to service in agriculture. Only 3 to 5 per cent. have actually taken to farming, and a very negligible percentage to other occupations.

(x) (1) Agriculture can be made attractive to middle class youths, by offering them lucrative posts both in the Agricultural and Revenue Departments, and especially so in the latter where at least 25 per cent. of the posts should only be filled with agricultural graduates.

(2) That a guaranteed post should be given to the student who passes first class first every year.

(3) Facilities and encouragement should be given to those who go in for farming in the shape of (1) special training for a couple of years in the technique of commercial farming by keeping them on Central Government Farms as well as on specially selected private farms, by giving them a special stipend for the period for their maintenance while under training; (2) suitable lands if available in our territory on easy terms or securing them such lands from Indian States; and (3) long-term loans on easy interest to start their concerns.

(4) By treating agriculture as an honourable profession in the eyes of the public; and lastly

(5) by starting agricultural colleges in representative tracts of the Presidency, e.g., Sind, Gujarat and Karnatak, in addition to the one at Poona; as many people do not seem to favour the idea of sending their youths to Poona where soils, climate and crops differ very widely from their own and where the expenses are enormously greater than those in the localities mentioned above.

(xi) No. Not in my knowledge.

(xii) By starting night schools as in Pardi taluka of the Surat district where some 20 are recently started with good attendance. These could be popularised if (a) good, sympathetic teachers are selected for this job, (b) if of backward classes, by supplying them with slates, books, etc., and also by giving them prizes. These may be only aided schools.

(xiii) The question of rural education is a big one, but it must be faced, if agriculture—the *basic industry of India*—is to be improved; by introducing compulsory primary education in all the rural areas in addition to the foregoing.

(a) The administration should be left to the Local Boards as at present arranged; but the Director of Agriculture might have his say in arranging the curriculum for the same.

(b) As regards finance, Government may assist the Local Boards with substantial contributions, but if that is not possible, they may empower the Local Boards to levy special cess for the purpose.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(a) The most successful measures in modelling the practices of cultivators have been:

1. The departmental demonstration farms or plots. These should be one in each district or at least one for a similar tract. Nowadays, in some quarters it is argued to effect economy that these demonstrations should be conducted on cultivators' fields with a view (1) to lessen the cost of maintaining such farms, (2) to convince the cultivator on the spot as he seems to doubt about the correctness or costs of the results obtained on Government farms and (3) to attract the attention of more cultivators on the spot as most of them will not take the trouble of going to visit the farms. This is mostly true in case of introducing new crops or better crops than their own, but is not so in cases where improvement or change in their existing cultivation practices is desired as it is very difficult for the propaganda officer to exactly copy the farm practices on a cultivator's field with untrained men and bullocks taken on hire or on loan from the cultivator and also due to want of knowledge of the environmental conditions of the plots he selects. It actually takes several years before the cultivator is induced to accept the new methods of tillage shown to him year after year on a demonstration farm. Once they are convinced, the method spreads like anything without any further propaganda.
2. Small demonstrations and shows in central places or in places where big fairs are held or where large numbers collect for pilgrimage on certain days in a year.
3. By bringing parties of selected cultivators to demonstration farms.
4. By issuing literature in the form of leaflets, bulletins, etc.
5. By lectures with magic lantern.

The above measures are all in the order of merit. Perhaps a moving cinematograph will be better than many of the foregoing and requires to be tried if finances permit.

(b) (1) If the propaganda officer is supplied with trained men and bullocks for conducting field demonstrations and, if they are found to be successful, to collect parties of cultivators of the surrounding villages and show them the results in their own midst.

(2) The present propaganda staff is too inadequate for carrying on any effective propaganda and should be extended to a very large extent, i.e., up to nearly 3 to 4 times the present strength.

(3) A greater co-ordination of the Revenue Department in this respect is a sheer necessity.

(c) (1) The cultivators must have full confidence in the expert selected for giving them advice; (2) the expert must be able both by arguments and actual demonstrations to convince the cultivators he has to handle; and lastly, (3) he must guarantee any losses sustained by cultivators in following his advice.

QUESTION 5.—FINANCE.—(a) Government as supreme landowner of the soil should finance all such operations tending to improve the soil. It should also arrange for long-term credit to cultivators. The short-term credit may be left to be managed by the co-operative societies or the village *sowcar*.

(b) The rate of interest charged on *taccavi* should not be more than that which Government has to pay for borrowing money *plus* the establishment cost; the *taccavi* rules should be made more elastic and lastly it should be made available within a very short period after application and it should be distributed directly by a responsible Revenue Officer not below the rank of an Assistant Collector.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(a) (i) (1) High charges of litigation and several other indirect taxes falling on the cultivators, (2) no good banking facilities, (3) absence of suitable facilities for safe borrowing, (4) poor and precarious harvests, (5) to some extent excess expenditure incurred after social customs, (6) illiteracy and last but the most important is (7) absence of keeping accounts.

(ii) The sources of credits are mostly from village *sowcars*, to a very small extent from the co-operative societies and still less from Government in the form of *taccavi* loans.

(iii) (1) Precarious harvest; (2) precarious rainfall; in some years the cultivators for the sake of one last rainfall lose almost the whole crop and in addition their labour, seeds, manure, etc.; (3) high rate of interest.

(b) By showing better method of farming, by introducing compulsory and adult education and by keeping a sympathetic eye on the cultivator's wants such as grazing facilities, fuel, in doing away with the middlemen's profits in marketing their produce, in providing good roads and transport concessions on railway freights and in customs on their manures and machinery. They are not in favour of rural insolvency. They are more sensitive to pay up their debts than to declare themselves insolvent. The Acts *viz.* the Agriculturists Insolvency Act or the Usurious Loans Act or an Act to facilitate the redemption of mortgages will not help the cultivator to any large extent unless and until Government is prepared to finance them by opening agricultural banks in the rural areas, as the cultivators will lose almost all their credit and they will not be able to finance their needs without help from Government. We have already an example of the Agriculturists' Relief Act which, instead of giving the desired relief, has done some mischief.

(c) I do not think it will be a wise policy to control the credit of cultivators by restricting sales or mortgages of their lands. Such practices exist in several Indian States where the cultivators instead of being better off than ours are in a worst condition as compared to our cultivators or to those in whose States the right of sale or mortgage is not restricted. Not only that but some of our departments such as the Registration, Stamps, Revenue and Civil will suffer a good deal in their revenue. On the contrary, if the loss in revenue to be thus sustained is used in the improvements of the cultivators' needs, they would be well benefited. Not only that, but as stated above, no capital will be attracted to this business nor any capitalists with capital and money will ever try to enter the profession.

Answer to the 2nd question under the same item is also in the negative, because it will have the same effect as stated above. Not only that but the cultivators will be obliged to make the conditional sales without any written guarantee or actual sales at low prices.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(a) No. They are adjusting themselves though slowly. The speed could be accelerated by good education and by propaganda. They may be seen more where people are poor and not able to purchase the parts as in Ratnagiri or where the land is most valuable under very intensive farming such as in the Amalsad group of the Jalalpur taluka of the Surat district. In the former case it may partly be due to the fact that the cultivator may not all be living on their fields but might be migrating to Bombay and hence may not be feeling the pinch of this harmful

practice. If, however, owing to the present clamour about fragmentation, something should be done, I would suggest that Government might order that Survey Nos. both of Jirayat and Kiari lands may not be sub-divided below certain minima fixed separately for each tract. It is generally seen that a cultivator with a smaller holding attends to his land very carefully and tries to produce more in comparison with that of a man with bigger holding.

(b) Consolidation of holding is a very difficult problem to be dealt with. A Bill is being drafted from Mr. Keatinge's time. It is heard it is now ready for being introduced in the Legislative Council and even though it may be passed it is feared it will remain a dead letter as there are several difficulties in the way of its proper working. I do not know the contents of the present Bill, but if they be on the lines of those of Mr. Keatinge's in principle, then I think there will be some of the difficulties in the way of its successful working, as under:—

(1) I doubt very much whether any one has tried to collect any data for economic holdings in different tracts of the Presidency proper on which to base the calculations.

(2) Hindu and Mahomedan law of inheritance will have to be changed much against the sentiment of both the communities.

(3) Even if they be changed the elder brother or brothers will find it most difficult to pay cash to youngsters for their share and the burden of debt will be so heavy on the elders so that they will not be free from the debt for several years and hence very little improvements can be expected from the elders when they are heavily involved in debt.

If it be decided to share the produce the elders will not work with honesty and zeal (in whose charge the holding may be) while the youngsters will have very little faith in the honesty of the elders.

(4) This enactment will throw out nearly 50 to 60 per cent. of the present cultivators into regular labourers without giving them any training for any sort of skilled labour.

(5) To finance the scheme will be a very difficult business for the elder brother to pay the value of the share to the younger brother or to pay the excess amount for exchanging good land with poor land or to pay the price of land of an uneconomic holder.

(6) The present arrangements of holding in a village are *kiari* and grazing lands or garden lands situated just in the vicinity of the village and they are the most valuable and very cared for lands.

Now according to consolidation scheme the *kiari* lands and other lands mentioned above only form a small portion of the whole village area and will only accommodate very few cultivators. The rest will be without such areas. Not only that but those getting their holdings at the extreme ends of the village areas will be at the greatest disadvantage of going to and returning from their holding or they will have to stay on their plots which is impossible looking to their social ties and also in the absence of arms through danger of being robbed.

The money difficulty can be overcome if Government tries to finance them by opening rural agricultural banks but the other difficulties will remain and hence I doubt very much if the scheme will work successfully.

(c) No. No legislation is necessary in the matter. But I shall be too glad if disputes could be kept out of court by any other means, *e.g.*, instituting village panchayets on better lines.

QUESTION 8.—IRRIGATION.—(a) In Kaira and Ahmedabad districts the existing canals be so improved by providing more storage tanks that the water will be sufficient for rice and after crops. The new proposed canal be strongly recommended if a large storage area is reserved at its origin so that the water never fails for the *kharif* and *rabi* crops. If that is not possible, then extension of wells and tanks and the improvements of the present tanks be recommended to the utmost limit. In the case of wells all throughout Gujarat, a definite policy should be laid out and advances should

be made from the Famine Reserve Fund, because a greater part of the amount is being spent in Sind and Deccan after irrigation schemes.

The tanks will help irrigation and also help in increasing the underground supply of drinking water, so that the old ones be improved and new ones dug in several places. They will be very well done in the Panch Mahals.

In addition to the above, streams and nallas should be bunded as they will tend to increase the level of water in the wells for drinking and irrigation purposes.

(i) Perennial canals should as far as possible be aided by open drains; otherwise there is risk of salt coming up to the surface.

In order to see that the cropping and water on such perennial canals is conducted scientifically, an Agricultural Officer of the grade of Provincial Service should be attached to the Irrigation Department and that Department should be under the same Minister as for Agriculture.

(b) No. For distributing canal water adequately and regularly to cultivators, a committee consisting of an officer from each of the Revenue, Agriculture and Engineering Departments and an equal number of non-officials be appointed. It would be much better if canal water could be given by actual measurement and charged accordingly, instead of charging fixed rates for particular crops per acre, as this suggested method would compel cultivators to use water very sparingly and thus save a lot of waste caused by overflooding and percolation.

QUESTION 10.—FERTILISERS.—(a) Artificial manures do not pay when applied to dry crops due to their high costs. But *sann*-green manuring will do immense good if prepared and applied after the Chinese method as is done by Mr. Howard on his Indore Farm.

(f) (1) By propaganda. (2) By giving them facilities for obtaining cheaper fuel either from the forests near by or by giving concession rates on railway freights for taking fuel to localities feeling its want.

QUESTION 11.—CROPS.—(a) (i) The improvement of the existing crops could be effected by (1) selection of seed to a large extent; (2) by cross breeding; (3) by good cultivation and manuring, and lastly, (4) by judicious rotations.

(ii) The introduction of new early varieties of ground-nuts have done immense good to the cultivators in Khandesh where it has gone to more than two lakhs acres during the last 15 years or so, and to nearly 70 thousand acres in Gujarat during the last ten years or so, mainly through the departmental efforts. In fodder crops, Guinea grass, lucerne and *berseem* are the new introductions.

(iii) The distribution of seed is also a difficult problem. For the last 6 or 7 years I distributed between 17 to 20 lakhs pounds of improved cotton seed of 1027 A. L. F. type in the tract south of the Narbada, and several other seeds in other parts of my division, e.g., improved strains of *juar*, ground-nut, improved strains of tobacco and several others. In the absence of any executive orders from the Government like those in the Rajpipla and Chota Udaipur States to sow a particular seed, it goes very hard with the staff to wholly replace an inferior variety by a superior one. Not only that, but it requires more staff and more time to carry on the work properly. In the case of proved seed, if the majority use that particular seed, the minority should be made to use it under executive orders. This will simplify the work of the department to a very great extent.

(iv) The prevention of damage by wild animals. I was one of the members of the committee appointed to consider and adopt measures for the protection of crops from wild animals and stray cattle. I have nothing more to add to the recommendations made in paragraph 49 (pages 34, 35 and 36) of the printed report of the committee in 1923.

(c) These are:—(1) The introduction of 1027 A. L. F. cotton in place of the Ghoghari mixture in the tract south of the Narbada; (2) the introduction of tobacco strain No. 6 in Kaira district in place of the ordinary local mixture.

(3) Successful introduction of early ground-nut varieties on a large scale, nearly 50,000 acres in the Panch Mahals and Ahmedabad districts where there were practically no areas under ground-nut.

QUESTION 12.—CULTIVATION.—(i) In South Narbada tract, sowing wider apart, sowing or dibbling seed in squares and introduction of ridge cultivation. When the Surat Farm was started in the year 1896 cultivators of the above tract were sowing both cotton and *juar* 18' apart between the rows. Now in several places people sow 5" to 7" apart and in some cases between 24" to 36" apart. Bulletin No. 123 of 1925 of the Bombay Agriculture Department may kindly be referred to about Ridge Cultivation.

In Jalalpore, Bardoli and part of Chorashi talukas of the Surat district, people have been induced to sow *sann* as green manure crop between the rows of cotton and *juar* to be unrooted and laid by the side of the rows of crop when it attains a height of 15 to 20 inches, and the idea is spreading.

(ii) The customary rotation of *juar* followed by cotton is changed to *juar*, *til* and *tur* and cotton; or *juar* or *bajra*, ground-nut and cotton or only ground-nut and cotton in alternate years.

QUESTION 14.—IMPLEMENTS.—The improved iron ploughs did not make any headway in North Gujarat, due to their shares being worn out in a short time at most a day and it became very costly to replace it daily and in South Gujarat, the draft became so heavy on the black soils that they could not be worked economically though there was a very keen desire of the cultivators to get their lands ploughed with such ploughs as could be evinced by the number of tractors namely about 125 now working in Gujarat alone. The only difficulty they find is in procuring some spare parts of some of the makes.

QUESTION 15.—VETERINARY.—(a) It should be under the Director of Agriculture and Engineering, under the same Minister as Agriculture, Veterinary, Forest and Co-operative.

QUESTION 16.—ANIMAL HUSBANDRY.—(d) I was a member of the committee appointed to consider the question of the maintenance and improvement of the existing breeds of the Bombay Presidency in 1923. The summary of the recommendations is given on page 14 (Part VII) of the committee's printed report of 1923.

QUESTION 18.—AGRICULTURAL LABOUR.—(a) (i) 1. By paying higher wages and giving them other facilities.

2. By allowing them to work on contract system instead of on daily wages, they could still earn more.

(ii) To induce labourers of fairly good means to take up lands for cultivation on easy terms of occupancy price of much better still to make them sub-tenants on share system or on fixed rent system.

(b) There is seasonal shortage of agricultural labour in Gujarat. The deficiency can be made good by indenting labour from Marwar and Kathiawar. The causes are good lucrative appointments in towns and cities as skilled labourers in mills, as ordinary labourers in railways, steamers, salt works and other private engagements and migration to big towns for domestic work. In most of these, cultivators are the greatest sufferers as the labourers take from them several hundred rupees up to Rs. 700 or so for marriage and other functions and within a very short time run away to any of the above places from which the cultivators are unable to dislodge them and bring them back to their respective homes. In this connection it will be very desirable to introduce card system in the interest of the cultivators.

(c) (1) By taking such labourers and supplying them with bullocks, seeds, implements, etc., to start with on easy terms and recovering the amount by small instalments; or (2) by giving them lands on share system; (3) or by employing them on labour by capitalists.

QUESTION 22.—CO-OPERATION.—(b) Almost all non-credit societies mentioned in items (ii) to (ix) may advantageously be placed under the control of the Director of Agriculture. If this is not feasible due to some technical objections an experienced agricultural officer of the rank of a Assistant Registrar

be appointed under the Registrar of Co-operative Societies to organise and supervise such societies.

(c) There will be no objection for introducing such a legislation in cases of co-operative irrigation and fencing schemes, but it would not be desirable in the case of consolidation of holdings.

QUESTION 23.—GENERAL EDUCATION.—(a) I do not want to make any fresh ones other than those made under "Question 2.—Agricultural Education."

(b) (i) To make the rural life more attractive and happy by improving the hygienic surroundings of the village, by creating suitable games and giving other facilities available in towns and taluka *kasbas*.

(ii) If you want to improve agriculture, compulsory education should be resorted to in all the rural areas and every cultivator taught to read and write irrespective of some short-comings.

(iii) It is the age at which many boys are detained by their parents to help them in their agricultural operations.

QUESTION 24.—ATTRACTING CAPITAL.—(a) I have already alluded to some of the causes which tend to discourage capitalists from taking to agriculture under Question 6.—Agricultural Indebtedness—and Question 7.—Fragmentation of Holdings. There are other causes also which do not induce capitalists to take to agriculture; *e.g.*,

- (1) Uncertainty of rains and harvest.
- (2) Dearth of agricultural labour.
- (3) Want of thorough practical knowledge required to make the business a paying concern.
- (4) The occupation is not looked upon as an honourable one.
- (5) No definite policy is laid down by Government as regards the land tenure, and other prohibitive legislation which Government intend to take in the near future or at a distant date; so that they are always hesitant to invest large capital in land.

(b) (1) Uncertainty of securing definite returns due to precarious nature of crops and rainfall.

(2) No certainty about the increase in assessment at every 30 years' re-assessment.

- (3) Poverty of the owners of lands; and lastly
- (4) Illiteracy.

Oral Evidence.

8525. *The Chairman:* Rao Sahib Desai, you are Deputy Director of Agriculture at Surat?—Yes.

8526. You have put in a very interesting note and my colleagues and I are greatly obliged to you. Have you any general statement to make at this stage or shall I proceed at once to ask you questions?—I have no statement to make.

8527. You say on page 572 of your note, that the number of vernacular agricultural schools is insufficient?—Yes.

8528. You say "There should be at least one such school in each district." What type of school exactly do you propose?—Just like the one that you saw at Loni. I have got two in my district, one at Godhra in the Panch Mahals and one at Surat.

8529. Are they conducted in exactly the same fashion as is the school at Loni?—Yes.

8530. How many districts are there altogether?—Five districts.

8531. You have got two schools, and you think one in each district is enough?—For my tract it would do if we had three, because I consider Surat and Broach as one.

8532. Are you attracted by that type of school because you think it makes a contribution towards the education of the farmer?—Yes.

8533. Have you followed the after-careers of boys who have been through these schools in your own district?—Yes, most of them have taken to agriculture.

8534. They have gone back to their own farms?—Yes; very few, about 5 to 5 per cent., have gone into the public service.

8535. Could you give us those figures definitely?—I will send them* later on.

8536. Perhaps you would consult with the authorities at the schools?—Yes.

8537. Do you know whether an accurate record of after-careers is kept in the case of those schools?—Not very particularly, but we try to find out how many are farming.

8538. You apparently agree with me that such accurate record of after-careers is very important?—Yes, it is necessary.

8539. On the page 572 in answer to sub-section (x) you say, "Agriculture can be made attractive to middle class youths, by offering them lucrative posts both in the Agricultural and Revenue Departments, and especially so in the latter where at least 25 per cent. of the posts should only be filled with agricultural graduates." You are here, of course, thinking of the educated non-agricultural classes, are you not? You are not thinking here of middle class youths of the agricultural and cultivating class?—In this connection I have taken into consideration all those graduates who come out from the Agricultural College.

8540. You are not thinking here of the boys of the Loni school type?—No, not of the middle or primary schools.

8541. I suppose most professions can be made attractive if the salaries are sufficiently lucrative?—Quite so, but then if agriculture, which is the main industry of India, is to be made lucrative, there must be some inducement held out.

8542. On page 573 you say, "As regards finance, Government may assist the Local Boards with substantial contributions, but if that is not possible,

* *Vide Appendix.*

they may empower the Local Boards to levy special cess for the purpose." What do you mean there by a special cess?—Something like a local fund cess such as Government is now levying, Re. 1. Finance is not my subject. I simply suggest how to raise money, that is all.

8543. Forgive me; you do not suggest how to raise money, you suggest money should be raised?—That is, by some means that will not be objectionable.

8544. I am trying to discover whether you harbour any ambition to levy an *octroi* tax, a local tax on produce?—Not on any special thing; it is only a special tax either on the assessment which might be increased by one or two annas, or any other cess that the authorities may think best.

8545. On page 574 you say, "Government as supreme landowner of the soil should finance all such operations tending to improve the soil. It should also arrange for long-term credit to cultivators. The short-term credit may be left to be managed by the co-operative societies or the village *sowcar*." How comes it, if investment in these securities is sufficiently attractive, that the public does not finance agriculture?—That comes later on.

8546. I know, but I want to ask you here in connection with this?—Because sometimes restrictions are put on the *sowcars* by Government.

8547. You say, "Government as supreme landowner of the soil should finance all such operations tending to improve the soil." I want you to tell the Commission how it comes about that private persons do not invest their savings or credit in the improvement of the soil?—Because they do not see the security in it.

8548. Do you think the security is there for Government?—The Government as supreme landowner has every right and power over it.

8549. I so often meet the idea that the Supreme Government is something different from the taxpayer. Now I want to know what fund do you suggest the Supreme Government should tap in order to create this credit?—That is the business of the Government; my suggestion is only that even if Government has to borrow money on loan, just as it does for other things, it should be done.

8550. There is no magic about a loan, you know; it is only pledging the taxpayer's money?—Yes.

8551. I should like to see the words "the taxpayer" inserted wherever the word Government comes in this memorandum of yours?—There would be a little difference there.

8552. I only want wherever possible to make it plain that there is no magic about Government; the only funds available to Government are the funds of the taxpayers of this country. You know that, do you not?—I know that.

8553. On a point of detail, you said that private persons were disinclined to finance agriculture because of certain restrictions. What did you mean by that?—The Agriculturists' Relief Act has put certain restrictions on the *sowcars*.

8554. What restrictions?—As regards the mortgages or the rate of interest.

8555. Do you not think the general effect of the actions of Government over the last 50 years has been to increase the security to the lender out of all proportion to that which used to be enjoyed by *sowcars* in the old days?—I do not know the conditions in the old days; I know current conditions.

8556. Do you not think the power to recover in the courts has immensely increased the security of the *sowcar*?—Not in the case of agriculture.

8557. *Mr. Calvert*: Does that Act impose restrictions on the moneylenders as regards mortgages?—Yes, because they are considered as mortgages which have to be redeemed under the Agriculturists' Relief Act; instalments are given instead of possession of the land.

8558. Is the restriction on the cultivator or on the moneylender?—On the moneylender.

8559. *The Chairman:* Would it not be more correct to say that the restriction is on the cultivator, but its effect is felt by the moneylender; would not that be the position?—Take it anyway, but that is the general impression.

8560. You say, "The rate of interest charged on *taccavi* should not be more than that which Government has to pay for borrowing money *plus* the establishment cost." Do you suggest that Government is making money on *taccavi* loans at the moment?—No, I do not suggest that; I only suggest the rate of interest should be as cheap as possible to the cultivator.

8561. Do you think it ought to be cheaper than it is now?—Yes.

8562. Then do you think the Government is making money of *taccavi* loans?—I do not know that myself.

8563. You say that *taccavi* should be distributed directly by a responsible Revenue Officer not below the rank of an Assistant Collector?—Yes.

8564. Do you suggest that if officers below the rank of Assistant Collector distribute *taccavi* that the whole of the loan does not reach the cultivator?—do not want to make any imputations against anybody.

8565. But your imputations are in your words here?—Quite true, but then that is the safest way of expressing my views that there may not be any undue delay and undue harassment to the cultivators asking for the loan. I do not want to charge my colleagues with anything.

You want more security for your words than you are prepared to offer Government for its *taccavi* loan, I think!

8566. On page 575 you say, "It is generally seen that a cultivator with a smaller holding attends to his land very carefully and tries to produce more in comparison with that of a man with bigger holding." Do you wish the Commission to understand that you think the standard of cultivation in small holdings is higher than the standard of cultivation in large holdings?—Yes.

8567. Is that your experience after many years of service?—That is my observation during 30 years of service.

8568. *Sir Chunnil Mehta:* What do you mean by the expressions "smaller holding" and "bigger holding"?—The smaller holding is between 5 and 15 acres; between 35 and 50 acres we should call bigger holdings.

8569. *The Chairman:* I do not want to press the point too far, but holdings of, let us say, 5 to 6 acres, except in very peculiar and special circumstances, are not economic in the sense that they are capable of supporting a man and his family?—In dry areas they are not, except in very highly cultivated areas.

8570. On holdings of 5 to 6 acres is it possible for the cultivator to comply with the soundest rules of husbandry in the matter of crop rotation?—He does everything better than the bigger holders. The only difficulty is that he does not find employment for the whole year; he has to shift somewhere else to seek employment in his spare time, and he generally does that. It is only the small cultivators who try to raise the crops in the rainy season, either themselves or with their families; and then they try to get further occupation.

8571. I suggest to you it is infinitely easier for a cultivator handling 20 acres to farm with sound practice in the matter of crop rotation, tillage and so forth, than it is for a man who is farming, let us say, 5 acres. What do you say to that?—I think the 5 acre man does it more efficiently than the 20 acre man.

8572. *Mr. Calvert:* May I ask what you mean by "more." You say "produce more"?—"More" is a comparative term.

8573. Do you mean more per man or more per acre?—More per acre.

8574. *The Chairman:* On page 575 you say, "This enactment will throw out nearly 50 to 60 per cent. of the present cultivators into regular labourers without giving them any training for any sort of skilled labour." What do

You mean by that exactly?—I do not know what the present lines of the Bill are, but in Mr. Keatinge's time he discussed with me his Bill, and from that I learned that he wanted to make an economical holding according to each district or each taluka, and the minimum limit was to be fixed for each taluka. In one taluka it was considered that at least 20 acres of land was necessary to support one family without any other occupation. Now if 20 acre holdings are to be produced, then all those between 5 and 20 acres will have to be eliminated. Most of the holdings are between 5 and 10, and 10 and 15 acres. If we are going to convert these holdings into 20 acre holdings, the greater portion of the present cultivators will be ousted. That is what I mean.

8575. Yes, I understand your views, without necessarily agreeing with them; but when you speak of "this enactment," to what precisely do you refer?—That is the consolidation of holdings.

8576. But I take it you refer to a particular Statute or Bill?—Yes.

8577. Which Bill?—I do not know; I have written already that I do not know myself, but it is rumoured that it is being introduced.

8578. You are being very hard on a Bill which you have not seen?—Yes, but it is referred to.

8579. *Sir Henry Lawrence*: There was a draft Bill, was there?—Yes.

8580. Which you saw?—Yes, that was discussed with me at Surat.

8581. *Dr. Hyder*: You are talking of Mr. Keatinge's Bill?—Yes, in Mr. Keatinge's time.

8582. *The Chairman*: But are you referring to Mr. Keatinge's Bill here?—Yes.

8583. With regard to page 576 as to fertilisers, we should like to hear a little more as to your views on green manuring. Have you had experience of *sann-green* manuring?—Yes, I have been trying my best for several years since. In Broach I have not been so successful because sometimes the manure does not rot in the soil if the September rains are not enough. Then it remains on the surface not rotted and is carried away by the wind. The best method I find is that as soon as the *sann* gets to a height of about 2 to 3 feet it is cut and dried for three days in the open fields; then it is made into oblong blocks interlaid with mud.

8584. Cowdung or mud?—Ordinary field mud. Then it is kept for about six months so that it becomes the best possible manure and gives the best results. I have seen the effects of this manure being applied on the farms. It would solve the great difficulty in some of the Gujarat tracts where the rainfall in September is very precarious.

8585. Have you ever tried spraying these successive layers with a weak solution of cowdung?—No, sometimes earth is put over it.

8586. So that you are making a compost?—Yes.

8587. That is not quite the same thing as ploughing in a green crop, is it?—No, it is not quite the same.

8588. When you plough in a green crop which you have also dried, does that involve a fallow?—Yes, that would be the best thing.

8589. A whole year's fallow?—Yes; but no cultivator is ready to keep up fallow for a whole year.

8590. Do you know any large cultivators who are prepared to have a fallow?—Very few cultivators.

8591. And no small cultivators I suppose?—No small cultivator can afford to do it.

8592. But you still think the small cultivator is the most efficient?—In his own inter-cultivation and other things.

8593. On the same page you give the examples of Rajpipla and Chotta Udaipur where Governmental action has been taken to compel the sowing of new varieties of cotton seeds?—Yes.

8594. You argue from that, I understand, that in British India the same compulsion might be applied?—Yes.

8595. You see the difference between the two conditions, do you not?—I know, and so I do not press it. I simply suggest it, if it is possible on political and other grounds.

8596. If it were capable of proof that 80 per cent. of the cultivators in an area were willing to adopt improved varieties, would you compel the remaining 20 per cent.?—I think it would be justified.

8597. It might be justified, but would it be expedient; would you do it?—I think I should do it.

8598. Have you wide experience of the co-operative movement?—In the ordinary routine I observe things and in some cases I also help; I cannot be said to possess so much experience as the people in the department.

8599. Do you think that the co-operative organisations are being used as fully as they might be to advertise improved methods of cultivation and improved varieties of crop; in other words, do you think they are being used for propaganda purposes or not?—To a very small extent.

8600. Do you think it might be well if the co-operative organisations were more active in propaganda?—I think so, because they have got a large number of people.

8601. On page 578 you say, "To make the rural life more attractive and happy by improving the hygienic surroundings of the village, by creating suitable games and giving other facilities available in towns and taluka *kashas*." What do you mean by creating suitable games?—That is for the children of the village to have suitable games like cricket; clubs might be formed in almost all villages to guide these people and create a taste for these games.

8602. Would you like to see an attempt made to revive the ancient village organisation with the panchayet at its head?—Yes.

8603. How do you account for the decline of that system?—During the very severe rule of Mohammedans and Marathas in the intervening period these things have been lost. In peaceful times like the present I think they will take that form again.

8604. You probably know the history of the panchayet system of local leadership?—Yes.

8605. How was the panchayet constituted?—In olden times the headmen and some people of the village took upon themselves the whole burden of paying the assessment to the Government and of managing any disputes arising in the village. They did various other things; they assisted each other in sowing and harvesting, and other things.

8606. Were they usually old men?—Old men of good reputation in the village. Where the villages were small, two or three villages combined.

8607. Do you think the theory that wisdom goes with old age is as popular as it used to be?—Now-a-days it is not so.

8608. *Sir James MacKenna*: You would not be offended if I called you one of the old stalwarts of the Bombay Agricultural Department, would you?—No, on the contrary, I should thank you.

8609. I think you told the Chairman you had had 30 years' service in the Agricultural Department?—Yes.

8610. At what pay did you commence?—I began as a clerk on the Surat farm at a salary of Rs. 25.

8611. And you have now risen to be Deputy Director?—Yes, drawing Rs. 700.

8612. I think it would be interesting if you told the Commission what your training was?—I was the first student in the agricultural diploma course, in the first batch perhaps, under Sir Thomas Middleton in the beginning, and then under Dr. Mollison afterwards.

8613. You took the diploma?—Yes, I took the diploma. I applied to take my degree, but I could not be spared, and my Director did not allow me to do so; he said my rights would not be overlooked because I was not a graduate; so I kept quiet and have been working since then.

8614. After that you took up an appointment at Rs. 25 a month?—Yes.

8615. After you got your diploma?—After I got the diploma, I was given the appointment by Dr. Mollison himself as a clerk on the Surat Farm.

8616. At Rs. 25 a month?—Yes.

8617. And after that what was your career?—After ten months I got the post of Superintendent on the same farm commencing at Rs. 50 to 100. In 1902 I was given a post at Rs. 150 to Rs. 250 at the Hissar cattle-breeding farm. That farm was in a very bad state; the Government wanted to improve it and Dr. Mollison wanted my services there as agriculturist; so I went there for one year. On my return I had an appointment at Rs. 150 to Rs. 200 on the Surat Farm.

8618. Then you became a Deputy Director?—I became Divisional Superintendent of Agriculture in the year 1908; I remained for ten years in that position. I got the post of Deputy Director in 1918, and since then I have been working as Deputy Director.

8619. So that you have had a nice steady upward tendency all through your career?—Yes.

8620. Ending up as senior Deputy Director?—Yes.

8621. A good deal of work was done in this Presidency by Dr. Mollison?—Yes.

8622. Do you think the progress since Dr. Mollison left has been very marked compared with the amount of work that was done when he was working single-handed in the Presidency?—I think the progress now is considerably more.

8623. But the groundwork done by Dr. Mollison was extremely sound?—Yes, I must say that.

8624. Some of your best known cottons were produced then?—Yes, it was he who did the first work in cotton-breeding at the Surat Farm in the year 1901, and after that he tried to popularise the whole movement throughout India when he became Inspector General.

8625. We are now talking about our own times; we belong to the old school?—Yes.

8626. As you know, the Indianisation of the services is the policy of Government now. What method of training do you think is best for young lads who aspire to become Deputy Directors?—I purposely omitted to deal with that; I am on the verge of retirement and I do not want to make any comments on that.

8627. Would you rather not give me your opinion?—I will do so if you wish.

8628. I think it would be very desirable, because you are a very senior officer; you have gone through one process of training; we want to know what is the best method of training young men?—After graduating here, any of the first class students, after, say, four or five years' experience in India, may either be sent abroad, or an institution which may compare with English institutions might be established and further training given here.

8629. You are a firm believer in their doing a number of years' work locally after taking a degree?—I think so.

8630. That is better than sending them abroad immediately after taking their degree?—Yes.

8631. You attach great importance to the value of practical training?—Yes: unless they can compare Indian agriculture with English agriculture, I do not think they will be successful.

8632. They must have a thoroughly good grounding in their own subject before they try anything new?—Yes.

8633. How many farms have you in your circle?—I have got three big farms and two smaller ones.

8634. Do you live on one of them?—No, I live just near the central farm, near the Surat farm itself.

8635. How often are you able to visit that farm?—Almost every week.

8636. Do you find time to conduct research yourself as Deputy Director now?—I must say that with my touring and the official work which is increasing very much, I have very little time to do any research work myself.

8637. Of course, you supervise it very closely?—Yes.

8638. And you have a large staff of trained research workers?—Yes, I have about 24 graduates and some three or four gazetted officers under me.

8639. But speaking from your own experience, would you not think it would be a good thing if the Deputy Directors had time to keep a little research going?—Yes, I think so.

8640. Great emphasis is laid on the close relationship between teaching and research; I should have thought the relation between research and propaganda was also close?—Yes.

8641. If you had time and had not so many farms under your charge you would be doing a good bit of research, I take it?—Yes.

8642. *Professor Ganqulee*: What are the precise duties of a Deputy Director of Agriculture?—The precise duties are to see that the farms are well managed; the Deputy Director is responsible for all the experiments conducted on the farms.

8643. Who organises the experiments?—Mostly the Deputy Director, in consultation with the Director if the farm is a new one.

8644. Experiments are organised in consultation with you?—Yes. Then the Deputy Director has to do propaganda in the district, that is the main item if any real good is to be done by the Deputy Director. He has to see to all the requirements of the district; that is to say, any correspondence or disputes arising out of land come finally to the Deputy Director for information, either from the Government, the Revenue Department or some other department; he has to attend to that. He gets so many letters that he has very little time to do all these important things.

8645. Then I understand the first item of your work is to carry on experiments in the field?—Yes.

8646. The second item is propaganda?—Yes.

8647. Propaganda in what form, in the fields of the cultivators?—Yes, in conversation, attending big shows, and giving lectures on important occasions anywhere in the whole of the division.

8648. Do you participate in the organisation of shows and things of that sort?—Yes, it is all under my guidance. If I can be present, so much the better; if not, my Divisional Superintendent will attend to it.

8649. And you have to attend to the administration of your officers?—Yes.

8650. What is the nature of correspondence of which you speak? Is it correspondence with the Government?—Correspondence with the subordinates, correspondence with the superior officer and correspondence with local bodies.

8651. Is there any correspondence with the public?—Yes, so many queries come that we are really tired of giving them answers and satisfying them.

8652. Is there any correspondence from the large cultivators?—Yes, they enquire about many things.

8653. Who records the results of field experiments?—The Superintendent.

8654. Under your guidance?—Yes.

8655. And you go through the collected data?—Yes.

8656. You are stationed most of your time at Surat?—No, nearly half the month I am out in the district, and sometimes even more; the rest of the time I am in Surat.

8657. You come into contact with the co-operative credit societies?—Yes.

8658. And any other village organisation?—Yes, the Development Associations and Agricultural Associations, or any other society, such as the Cotton Sale Societies, in which the department has any interest or to which the department has got anything to say. Whenever we go there we see the Presidents or Vice-Presidents of all these associations, discuss things with them and lay out the lines, for the work; there are so many things.

8659. I want to get an idea of the nature of your propaganda and demonstration work. You carry on both demonstration and propaganda?—Yes.

8660. What is the nature of your propaganda?—The nature of the propaganda is to arrange small shows in the district.

8661. Let us take a particular village; you want to visit that village?—Yes.

8662. Do you get invitations from the village?—In some cases there are some controversial subjects to be discussed; if they have got some complaint about their lands, or want to introduce something new, as for example, a cotton sale society or an implements society, they invite us; otherwise we go of our own accord.

8663. Then how do you proceed?—If I stay there I generally enquire of the leading gentlemen or leading cultivators of the place where I may be put up for the night; they generally come and we discuss other matters with them as to local requirements.

8664. Are you in touch with any agricultural school in your division?—Yes.

8665. On page 572 you say, "The present courses do not suit the wants of rural population." That is in regard to agricultural education. Have you any definite suggestion as to how these courses should be improved?—I was not referring to the agricultural schools when I said that; that is with regard to the ordinary schools in the rural areas that are managed by the Education Department. An agricultural bias should be given in the general education.

8666. On page 573 you advocate compulsory primary education, do you not?—Yes.

8667. Do you think the time has come for that?—I think the time is more than ripe.

8668. You think it would be a good thing for the country?—Yes.

8669. Do you think the country would be prepared to pay excess tax or cess for it?—That is not my look-out. I do not go so deep into the subject as that; that is the look-out of the politicians and the people on the Councils.

8670. I suppose you realise that you cannot get 9d. for 4d.?—If you want my personal opinion, I would sacrifice anything else for education. Whatever my personal needs may be, I would sacrifice them for the sake of education. But I cannot give a general ruling as to what Governments should or should not do.

8671. But you think compulsory education would be good for the country?—Yes, it is necessary, that is my point. Unless there is general education you cannot expect the agriculture of the country to improve.

8672. I agree, but do you think because it is a good thing for the country, the country ought to be prepared to pay for it?—Yes, they must pay for it.

8673. You say the administration of education should be left to the Local Boards?—Yes.

8674. Are you in touch with the local bodies?—Now the whole administration of primary education is being handed over to Local Boards.

8675. But are you in touch with the work of the Local Boards?—Some of the Local Boards.

8676. Do you think they will be able to manage it?—It is an experiment; I cannot give my opinion off-hand.

8677. *Sir Ganga Ram*: You intend to reserve your opinion until you have retired?—I am on the point of retiring.

8678. *Professor Gangulee*: On page 573 you emphasise the importance of having demonstration farms and lessening the cost of maintaining such farms. The sum and substance of it is this, that you want farm costings to be kept in every demonstration farm?—Yes.

8679. Do you keep costings?—Yes.

8680. Have you introduced any system of keeping farm accounts?—We have, on all our farms.

8681. What do you understand by farm costings? Detailed farm accounts?—Everything, every pie.

8682. Do you believe in maintaining the continuity of demonstration work?—Yes.

8683. Year by year?—Yes.

8684. Do you do that yourself?—Yes, I have been doing it for 20 years.

8685. On page 574 you attribute indebtedness to "High charges of litigation and several other indirect taxes falling on the cultivators." What taxes are you referring to?—Taxes on tea, sugar, clothing, all the necessaries of life of the cultivator.

8686. Are you suggesting that they are so excessive as to be a cause of indebtedness?—In proportion to their earnings these charges are heavy.

8687. You also attribute indebtedness to some extent to excessive expenditure incurred on social customs. Do you consider that social expenditure is showing a tendency to increase?—No, it is not increasing; I should say there is a tendency for it to decrease.

8688. Can you give us any idea as to what percentage of the total income of the peasantry goes in taxes?—I have no data.

8689. Then you say, "We have already an example of the Agriculturists' Relief Act which, instead of giving the desired relief, has done some mischief." What precisely do you mean?—I mean that after the passing of the Agriculturists' Relief Act the *sowcars* instead of lending money on mortgage or on personal security only, have been asking cultivators to sell their lands either with or without condition, on the merely oral understanding that when the money is repaid with interest the land will be returned.

8690. On the oral understanding?—Yes, no written agreement is made; and it is only when every pie is paid the land is returned. In the event of the *sowcar dying*, the heirs not being instructed as to whether it was a conditional or a real sale, difficulties arise and the cultivators lose their land.

8691. That is to say, you think land is passing into the hands of the moneylenders owing to this Act?—Yes.

8692. What was the original intention of this Act?—To protect the cultivator.

8693. So that the object of this Act has been frustrated?—That is my view.

8694. You think the rules as to *taccavi* should be made more elastic?—Yes.

8695. In what way?—When a man applies to the Collector for *taccavi* the correspondence goes to the *mamlatdar*. It is sent back to the village where a form has to be filled up saying that the man owns so much property, a house and other things. It then goes back again to the authority sanctioning the *taccavi*; then it comes back again to the *mamlatdar*, and afterwards the *taccavi* is paid. These routine formalities take a very long time.

8696. There is considerable delay in formalities?—Yes.

8697. Can you suggest any method by which these formalities could be obviated?—I have already said it.

8698. You think that it should be in the hands of responsible Revenue authorities?—Yes.

8699. On the question of fragmentation of holdings you say the proposed enactment "will throw out nearly 50 to 60 per cent. of the present cultivators into regular labourers without giving them any training for any sort of skilled labour." I do not understand that statement. What economic law, as a result of this enactment, would operate so as to throw out 50 or 60 per cent of the cultivators from their land?—The largest number of holdings are between 5 and 10 acres. The number of holdings between 10 and 15 acres come next, and then come the holdings between 15 and 20 acres. Above 25 acres the number is substantially decreased, and up to 100 acres still more decreased. 20 acres at least are necessary to maintain one family.

8700. *The Chairman*: You are thinking more of the sub-division than of the fragmentation of holdings?—Yes.

8701. *Mr. Calvert*: Do you mean an owner's holding or a cultivator's holding?—A cultivator's holding.

8702. *Professor Gangulee*: On page 578 you say the occupation of agriculture is not looked upon as an honourable one. Is that by the educated people?—By almost all people; above all, officials.

8703. They do not consider it honourable?—No.

8704. Do you consider it honourable?—I consider it most honourable.

8705. *Dr. Hyder*: Have you in Gujarat a proverb similar to the Hindustani proverb which says that the best occupation is trade and the worst is Government service?—The actual feeling in Gujarat is that the best occupation is Government service and the worst is agriculture.

8706. *Sir Ganga Ram*: As Deputy Director of Agriculture I suppose you share that view?—I am doing my best to urge people not to accept any service but to go in for agriculture; but a man in Government service with an income of Rs. 10 to Rs. 15 a month is considered to be in a better social position than a cultivator, even though he owns his land. In my district most of the land is owned by *pattadars* who consider it below their dignity to cultivate the land, as they did before 1900.

8707. *Sir Chaulal Mehta*: Why is that?—That is because of this general education which has caused people to give up agriculture and seek Government service.

8708. *Professor Gangulee*: Have you any suggestion to make as to how this mental outlook could be changed?—I can only make one suggestion; I found that during the War when prices were so high men in Government service could not maintain themselves on salaries of 15 to 20 rupees a month and they went back to the land.

8709. You mean that economic pressure would bring them back to the land?—Yes, if you raise the standard of living they will have to go back.

8710. Therefore the necessary pre-requisite of such a change of outlook is improvement of the standard of living?—Yes.

8711. On page 578 you say, "No definite policy is laid down by Government as regards the land tenure and other prohibitive legislation which Government intend to take in the near future or at a distant date." What prohibitive legislation are you afraid of?—I do not want to go into the details of what Government are going to do in the future. This Agriculturists' Relief Act is one thing; then every time there is fear of the assessment being raised. The system of giving receipts is a very big item in the mind of the cultivator nowadays; whenever I go into the district I hear a great clamour about that. The payment of the assessment to the village authorities used to be credited in the country account book; that system has now been discontinued and a receipt only is given. The people have misgivings; they say, "Government do not want to maintain our right on the land, we are

being treated like ordinary tenants." This sort of thing has had its effect on the mind of the capitalist and has deterred him from investing money in land. On the contrary, I know of some people who have been selling their land. Big people owning thousands of acres of land in Surat, for instance, a very well known family who have been doing this business for the last 100 years or more, have been selling their land simply because of that fear.

8712. Do people complain about it to you?—Yes, several of them.

8713. Is there any Taluka Development Association in your district?—Several.

8714. How are they working?—Those that have got good finances are working very well.

8715. Have they got good men?—Yes.

8716. Energetic young men who know the job?—Yes.

8717. You are quite satisfied with them?—In a taluka in Surat there is one of which the President is a young energetic man who has thousands of acres of land; he is a barrister of a very well-known family; he is an educated man and is interested in the land. An agricultural graduate of the best type is working very well for a Taluka Development Association which is doing very good work. That was the first association started; it was the work of Sir Chunilal Mehta. Since then I have been able to add about five associations while I have been in my division.

8718. *Mr. Calvert*: On page 572 you say, "Agriculture can be made attractive to middle class youths by offering them lucrative posts both in the Agricultural and Revenue Departments"?—Yes, or any other Department, such as Forestry, Engineering or even Education.

8719. But how do you propose to make agriculture attractive by taking youths away from it?—They will be very few out of the total population; if you take 100 or 200 people it will not matter very much. What I mean is this that if, instead of graduates in arts becoming *mamlatdars*, agricultural graduates became *mamlatdars*, they would understand things better than the ordinary layman; that is my idea.

8720. We have had evidence that these graduates prefer Government service to practical farming?—Up till now it has been so.

8721. Do you think the cure for that is to reduce the pay of the Agricultural Service until it is no longer attractive?—You will not get recruits for the college if you do that.

8722. Do you suggest that they should be forced into practical farming?—That is my desire; I have suggested that several times; but you cannot expect all of them to go in for farming.

8723. Is it your opinion that there is more money to be made from teaching agriculture than from practising it? For instance, could you have earned your present salary from practising agriculture?—Do not ask about individual cases.

8724. Are there in your circle any moneylending landlords?—Very few nowadays; there were many before this Agriculturists' Relief Act was passed. Now they are not going in for it unless on the condition that the land is sold subject to the oral condition that it is to be returned after the money is paid. There are *sowcars* who do business on those lines, but they will not advance money on the personal security of cultivators.

8725. You seem to advocate that Government should start agricultural banks. What exactly do you mean by an agricultural bank?—I mean that whenever cultivators want money it should be advanced by agricultural banks.

8726. Is that something different from co-operative banks?—Yes.

8727. Do you know any country in the world where agricultural banks have been successful?—I have read of it in some European countries, but I cannot give you definite instances now.

8728. You cannot tell me which country?—No.

8729. On page 575 you state a lot of objections to the consolidation of holdings?—Yes.

8730. Are those objections based on your practical efforts to consolidate holdings or is it merely theory?—My practical experience has been in Gujarat. In Baroda they saw what you had done in the Punjab and tried to copy you. They made permissive legislation, but it has been a dead letter.

8731. They passed their Act first and saw the Punjab system afterwards?—I do not know. I suggested to Mr. Keatinge that if this idea was to be tried in this Presidency, Ahmednager might perhaps be the most suitable place.

8732. On the same page you say you doubt very much whether the scheme will work successfully. If it succeeds in an out-of-the-way wild Province like the Punjab, why should it not succeed everywhere?—There may not be Calverts all over India who can do it.

8733. On page 578 with regard to attracting capital you give a number of reasons why capitalists do not invest money in agriculture; and yet they lend money to agriculturists?—Yes, on security.

8734. It was said of England once that the only persons who made any money out of agriculture were the lawyers who were engaged in drawing up the mortgages?—I said in the beginning that litigation was a factor.

8735. The people who make money out of agriculture are the money-lenders?—Yes.

8736. Could you tell us roughly what percentage of the cultivated area of Gujarat you have influenced with your new methods?—Do you mean taken as a whole, or with reference to cotton or any particular crop?

8737. Taken as a whole?—It will not be more than about 20 per cent.

8738. As high as 20 per cent.?—In the South it is more than that, while in the North it is less than that.

8739. Of all the crops?—Not all, only cotton.

8740. But taking the gross cultivated area how much will it be?—It would not be more than 10 per cent.

8741. (You are a very experienced gentleman; have you in the course of your cogitations compared the standard of cultivation by persons who are holding land on lease as tenants with that of persons who are cultivating their own land?—Yes.

8742. Which does the most intensive cultivation?—Those that have got their own land.

8743. And if a man is cultivating some land as owner and some land as tenant, what will be the position?—He will pay more attention to his own land than he will pay to the landlord's land.

8744. He gives more ploughing to his own land?—Yes.

8745. What about manure?—He would give more manure to his own land; that applies to everything.

8746. He is apt to concentrate on his own land?—Yes, and treat the rest as a side industry.)

8747. Mr. Kamat: You are advocating agricultural colleges for the divisions, are you not?—Yes.

8748. That is to say, agricultural colleges for Gujarat, Sind, Karnatic, and so on?—Yes.

8749. And it is part of your system of divisional agricultural colleges that 25 per cent. of the posts in Government service should be reserved for graduates of those colleges?—Yes.

8750. And yet you try to persuade people not to go into Government service?—I am against Government service, but the first thing is that I want to attract as many students to agricultural colleges as is possible by any means; so that if they do not get Government service they will have to return to the land; they will not go to other occupations.

8751. You think this system of guaranteeing 25 per cent of the posts in Government service will attract students?—It is not guaranteeing; it is an understanding by the Government.

8752. Without this understanding there would not be enough students attracted to divisional agricultural colleges?—I doubt it.

8753. You think that without this system of guaranteeing or understanding, there would not be enough pupils coming to the agricultural colleges?—Not so many. If there were one more college, there would be enough students for two colleges, but not for four.

8754. What is the value of these agricultural colleges from the point of view of practical farming in your opinion?—The only question that matters is how to train these people up; I have already suggested that those going in for farming must have something like a post-graduate course of two years' actual farming; if that could be arranged, I think it would be the best possible training.

8755. So far we have heard that very few people go back to practical farming after graduating from these colleges?—Yes.

8756. Therefore the value of the agricultural colleges lies in the scientific training and training of teachers?—Yes.

8757. Not turning out practical farmers?—No. When people come out of colleges, even from European Universities, they are not masters of their vocation; it is the after-study that makes the man. College merely affords a guide as to how to find out things.

8758. If so many of these students do not go back to actual farming, is there any point in insisting that those who are admitted to these agricultural colleges for training for the first year's course should be mainly from the agricultural classes?—If they come from the agricultural classes, so much the better; that is desirable.

8759. But they do not go back to farming?—Never mind, wherever they go they will always have that tendency to look to agriculture as their own subject, and even though they go into other occupations they will always be talking to the public and interesting them in agriculture.

8760. If you want to turn out scientific men, why not avail yourselves of the best intellectual material without this particular preference for students from the agricultural classes?—I say that is the most desirable thing, but if you cannot get that, then you can go to the next best.

8761. With regard to the seasonal shortage of labour, you say something about the card system. Will you amplify that?—I am Chairman of the Divisional Board of Agriculture for Gujarat; during the last three years several complaints have been made by cultivators as to this labour question. I have asked for several books on this labour question from different parts of India and outside India to see for myself whether there is any easy remedy that could be suggested to the Division and to Government. From all the literature I got from Bengal, Mysore, Africa and other places I have only elicited one point, that is that in Rhodesia there is a system by which once you employ a servant he has to complete his contract for two years, five years, or whatever may have been arranged. If he fails to complete his term of employment and wants to join another service, he must take his card with his employer's signature on it; without that card no other person could employ him.

8762. Is not that tantamount to a system of indenture?—No, not at all: it is not the system of indenture such as exists in Fiji and other places. This card system is very simple; if my servant has this card with my signature upon it, he can leave me and seek other employment.

8763. Will you require legislation to enforce such a system?—Yes, I think legislation will be required.

8764. And you think that is the only way to remedy the present position?—Yes. A cultivator may pay Rs. 700 or Rs. 800 to a single labourer and he may run away next day and get employment on some railway work or something of that kind; the employer cannot get the man back and he loses heavily. Some remedy is necessary. This is merely my suggestion after studying so many laws on this matter in different parts of the world; that is the simplest I can find.

8765. You explained the working of the Deccan Agriculturists' Relief Act to some of the Members of this Commission. That Act has defeated its own purpose?—Yes.

8766. Will you tell me why the psychology of the moneylender has not been changed by that Act, and why he is tightening his hold on the borrower? Is it that he feels that the law has created disabilities and difficulties in his way?—Yes, whenever he sues a cultivator, the tendency is for the court to give instalments either with or without interest and in very small amounts. He cannot afford to lend on those terms and therefore he tightens his grip on the cultivator. When he sues in the civil court to recover his money, in accordance with the Relief Act he is not given a decree committing the borrower to jail or ordering the sale of the borrower's cattle; he merely gets a decree ordering yearly instalments, or whatever the court may think fit. It is natural that the *sowcar* in those circumstances should take steps to protect himself before lending.

8767. So that mortgages on land are taken in the form of fictitious sales?—Yes.

8768. That is the result of the passing of the Deccan Agriculturists' Relief Act?—Yes, such sales did not take place before the passing of that Act.

8769. The real remedy is to provide finance through land mortgage banks and not try by artificial means to alter the psychological relations between lender and borrower?—I do not know anything about land mortgage banks.

8770. But you agree that artificial means of correcting the relations between moneylender and borrower have no effect?—That I agree with.

8771. *Deewan Bahadur Malji*: Having regard to the atmosphere that is created by the present education in primary schools, may I take it that the bias schools will really prove a turning point in the history of education in rural areas?—Yes.

8772. The education of the adults will play the next important rôle?—Yes.

8773. You are actually trying both these experiments in the Surat district?—Yes.

8774. And you think they are, on the whole, a success?—Yes.

8775. Some of the Development Associations to which you have referred have been registered under the Co-operative Societies Act and some not?—Yes.

8776. Is there any sentimental objection to having them registered under the Co-operative Societies Act?—Not so much sentiment; I think it is a personal matter in one or two cases. Some of them are willing to be registered under the Co-operative Societies Act, and I think the others will come round in the course of time. We ought not to magnify that point at all. When they see other associations registered under the Act and see their work, they will come round of their own accord.

8777. In the case of associations which are registered under the Co-operative Societies Act the members will have some sort of guarantee?—Yes.

8778. But not so in the case of mere individual members; they might drop out at any time by non-payment of the prescribed fee of Re. 1 per annum?—That will be so even if they are registered.

8779. In that case the society's membership is practically guaranteed; they continue as members?—But if they want to drop out they may.

8780. In that case, of course, it will be left to them?—Yes.

8781. It may be made compulsory?—Then people may not like to get themselves registered, if you make it compulsory.

8782. I refer to societies as such; they are practically made compulsory members of the Institute?—If they get themselves registered under the Charitable Endowments Act, we want security for the money.

8783. But the difficulty will be with regard to individual members dropping out at any moment?—They will not drop out; Government has authorised the collection of the fees from members.

8784. Did not an experiment of that kind fail in Broach and Khandesh?—That was long ago.

8785. And things have not yet settled themselves down?—No.

8786. In Southern Gujarat is there a tendency to grow more cotton or cotton with cereals?—It depends on the values of the individual crops; the cultivator will grow what is more profitable.

8787. Do they sow cotton upon cotton in the next year?—Yes, if cotton prices are good they will sow cotton after cotton for several years. It is a commercial matter; you cannot force them to do what you want them to do.

8788. Would you not use compulsion?—No, I will not give any consent to that; I would leave the cultivator free.

8789. Do you advise him?—We advise, but they will not follow our advice. They will only go according to the money they get, and if by growing cotton they can get more money, I would certainly allow them to do so.

8790. *The Chairman*: I suppose that is without prejudice to what you told the Commission just now about your desire to compel the 20 per cent. why might resist the plan of improved cotton varieties?—Yes.

8791. *Dewan Bahadur Malji*: Would you advise it even at the expense of deterioration of land?—No, it will not deteriorate cultivation. Now instead of growing 2 feet apart they are growing 6 feet apart.

8792. You mean ridge cultivation?—No, they are growing cotton 4 to 6 feet apart; next year they are changed so that the roots do not come on the same row, that makes alternate rotation.

8793. A sort of half fallow?—Yes.

8794. What do you take to be the ordinary return of cotton crop per acre?—It depends on the price; if you tell me the price I will give you the outturn.

8795. And could you tell me the costings?—Yes.

8796. What is the ordinary thing?—For the Broach district I take it at 400 lbs. an acre, and the cost of cultivation is between Rs. 50 and Rs. 60.

8797. Will the difference be the net result or do you deduct other allowances?—No, there are no other allowances.

8798. Then what is the margin of profit?—You can calculate it according to the price you put on the crop.

8799. *Professor Gangulee*: Do you mean 400 lbs. of lint?—No, 400 lbs. good cotton, kapas; that is the average yield for the Broach district.

8800. *Sir Ganga Ram*: What is it in America?—1,000 lbs. per acre; in Egypt it is 1,500 lbs. per acre.

8801. *Sir Chunilal Mehta*: Do you think the prices of cotton are now going down?—Yes, with the result that food crops will be grown instead of cotton crops.

8802. *Dewan Bahadur Malji*: The exchange question also affects the situation?—That is a political question; I have no concern with it. I do not desire to express my opinion on that unless you desire it.

8803. Do you think the agriculturist will suffer in any way because of the exchange?—Yes.

8804. You are in favour of loans on easier rates of interest?—Yes.

8805. The present rates do not pay the agriculturist?—No, and will not pay.

8806. You told us that agricultural banks are required?—Yes.

8807. Am I to take it that you desire some sort of zamindars' banks which may advance large sums of money to large landholders?—I suggest Government agricultural banks financed by Government.

8808. Such as exist in Baroda territory?—Yes.

8809. You have also advocated the extension and repair of wells and tanks out of Famine Reserve Funds?—Yes, that is the greatest necessity where no canal irrigation is to be had.

8810. That is a great need of the day in Gujarat?—Yes, in the whole of Gujarat.

8811. You have referred to the fragmentation of holdings in Baroda territory. I think you have inadvertently omitted to mention Sokhda. Have you seen that is being done in Sokhda?—No.

8812. Will you be surprised to learn that half or three-quarters of the work has been done there?—I should be glad to see it.

8813. That is the consolidation in Baroda territory?—I should not be surprised at anything that that State does.

8814. *The Chairman*: Do you mean that nothing they could do would surprise you?—No; take the case of the States of Rajpipla and Chhota Udaipur; they wanted to have the whole of the land sown with one kind of seed and they did it with one stroke of the pen.

8815. *Sir Chunilal Mehta*: In Baroda it is a voluntary system?—Yes.

8816. *Sir Ganga Ram*: In the Punjab it is subject to consent?—Our Government would desire it, but they have to consider whether it would be palatable to the people; they have to take public opinion into consideration.

8817. *Sir Henry Lawrence*: I think you said you looked to the panchayets to help in the improvement of agriculture?—I was thinking of the petty litigation in which cultivators become involved; if that could be handed over to the panchayets I think it would lessen the evil to some extent.

8818. Then you do not advocate using the panchayets for the improvement of agricultural practice in any way?—I doubt whether they will be of any great use in that respect.

8819. You want the panchayets to help to settle disputes between cultivators and their creditors?—Yes.

8820. Do you look to panchayets of the old type or the new type?—Of the new type. They could deal with village problems such as hygiene and roads. During the last monsoon the villages got into such dirty state that on entering a village one got knee-deep in mud. The village panchayets could deal with matters of that sort. That is why I have suggested that the village panchayets might be asked to see to certain improvements in and around the village itself.

8821. Do you want these panchayets to be constituted in the way in which they used to be constituted or in some different way?—On the lines that have been charted out at present, with some small additional powers.

8822. The present panchayets are very different from the old panchayets?—Yes, they are different from the old panchayets; I do not advocate the old panchayets at all.

8823. The old panchayets were for each separate community?—Yes.

8824. There were separate panchayets for *patidars*, Brahmins, and so on. Do the *Dhuralis* have panchayets?—I cannot say exactly what they were, but they had some such thing.

8825. So that in one large village you might have four or five different panchayets under the old system?—It may be.

8826. Whereas now the custom is for one panchayet to represent all the different classes of the community?—Of the whole village.

8827. Do you think the old form of panchayet can still be effective?—I make no comparison with the old panchayet; I only advocate the new form of panchayet which is representative of the whole village and is able to deal with these things.

8828. Representative of all classes?—Yes.

8829. That is what you advocate?—Yes.

8830. Do you propose to entrust to a panchayet of that kind powers of compelling cultivators to improve their practice? If, for instance, 80 per cent. of the cultivators are prepared to adopt a certain practice, is the panchayet to have powers of compulsion with regard to the remaining 20 per cent.?—No.

8831. Then what authority is to enforce that improved practice?—Government; nobody else.

8832. The *mamlatdar*?—No.
8833. Then who?—The Government itself.
8834. But the Government must act through some local agency?—No doubt they might act through the Revenue authorities, but the final judgment should rest with the Government.
8835. But the final judgment of the Government must be enforced in actual detail by some local agency; what is your local agency?—My local agency is the *mamlatdar* and the village officers.
8836. You advocate that?—Yes, but I do not agree that these panchayets should be given that power.
8837. But you wish to have this compulsory power?—Only in very rare cases.
8838. Where it does occur you want to have it enforced, by the *mamlatdar*, the village *patel*, and so on?—Yes, if it is to be administered at all.
8839. But that is what you advocate?—Yes.
8840. You mention that some change in the system of keeping village accounts has deprived *sowcars* and capitalists of any confidence and prevented them from investing capital in land. Has that view of yours ever been represented to Government?—I do not know.
8841. You have not reported on it?—No, but I have heard that people have protested against it several times.
8842. *Sir Chunilal Mehta*: What is the change?—Some ten years ago there was a regular book kept showing the rent a man had to pay and what he owed, and these books were checked. Now that system has been abolished, and only a small paper is given for the amounts received, and most of these papers are lost by the cultivators.
8843. *Sir Henry Lawrence*: Has that been inquired into by the Revenue Officers and any report made to higher authority?—No.
8844. You have never represented this?—No.
8845. How long have you been aware of these difficulties?—It is five or ten years since the change was made. I did not think it was my duty to report the matter; it is the duty of the people themselves.
8846. *Sir Chunilal Mehta*: You are not aware that the people have made representations about it at any time?—They have made representations to local officers. Villagers have asked me what the idea was, and I told them they used to get their receipts in a book, and now they get them on pieces of paper. Personally, if I get a receipt I do not care whether it is on a piece of paper or in a book.
8847. *Sir Henry Lawrence*: But you say intelligent men, capitalists, do care?—Capitalists and *sowcars* do not know what these things are.
8848. They are all ignorant?—Not exactly ignorant, but they know very little about this Government business.
8849. *Sir Ganga Ram*: Did I understand you to say to the Chairman that only 3 to 5 per cent of the product of your school take to agriculture?—Of the college graduates. Of the graduates of Poona college, 3 to 5 per cent have taken to agriculture and the rest have gone into service.
8850. What do you refer to here, in what you say on page 572?—The agricultural graduates.
8851. How many years' service have you?—30 years.
8852. During your service, what agricultural improvements have you introduced to justify your salary?—I have enumerated them all.
8853. I can only find one paragraph, in which you say you or your department introduced ground-nut; that is all?—That is my own thing.
8854. I give you credit for that, but what else have you done?—Introduced improved cultivation. The cultivators used to sow at a distance of 18 inches apart when we started the Surat farm.
8855. Give me the economic value of that. How much more do they get now?—10 to 15 or 20 per cent.

8856. You say your capacity is only 400 lbs. an acre; our cotton is 700 lbs. ?—It is not 700 lbs.; it may go to 500 or 550 lbs.

8857. Do not contradict me; I say what I mean. We can produce that amount up-country; what have you been doing in the direction?—Have you read my ridge cultivation pamphlet? It has gone up to 1,000 lbs. on the Surat farm. It is all done by ridge cultivation.

8858. What do you mean by 'ridge cultivation'?—Our method of planting cotton on ridges. We are trying to spread that as much as possible.

8859. To what extent have you spread it?—This is only a recent introduction, it was introduced in the last three or four years. It may take six or even ten years to spread it over the whole tract.

8860. By that time you will have retired?—Somebody will succeed me.

8861. Is there any possibility of irrigation from the four rivers that pass through your territory? Have you ever noticed that these rivers bring down volumes of water, and no use is made of it? Have you ever made representations about that?—I know the history of this matter, because when the Irrigation Commission came in 1901 I was Superintendent of the Surat farm and collected almost all the data for them. I know from conversation with them then and from what I have learned from our department that it is impracticable to have any canal irrigation from the Narbada or the Tapti.

8862. Is that the opinion of the irrigation people now?—I do not know what their opinion is, but since then the matter has never been gone into by anybody else.

8863. You have never given thought to it?—It was found to be impracticable; how could thought be given to it?

8864. Can you point to one paragraph where they say it is impracticable?—You must refer to the Irrigation Commission Report of 1901.

8865. You live at Surat?—Yes.

8866. Have you ever observed the desolation on both sides of the Tapti river?—Yes.

8867. Have you ever represented that that might be improved, and that the river might be taken advantage of to a certain extent?—It cannot be.

8868. Do not say 'it cannot be'?—The country is too level near the sea; there is no gradient for a canal.

8869. Have you never thought about it? It has pained me every time I have passed that way?—I do not think anything can be done.

8870. You said in answer to Sir Henry Lawrence that you advocated panchayets; do you mean for a village or a taluka?—For big villages, and for small villages combined together.

8871. How many people would you have in it?—2,000.

8872. Two thousand?—A population of 2,000.

8873. That is not what I mean. How many people would there be on the panchayet?—Half a dozen at the most.

8874. How would you select those men, by franchise? I suppose there are different castes in the villages?—Yes.

8875. Would you give them representation according to the number of people?—That must be decided by others.

8876. Have you seen panchayets working in any other Presidency?—No, but I have seen them in my own district.

8877. Are they working well?—They are not working very well, but they are working now.

8878. If their decrees are not accepted by the parties, would you give them powers to enforce them?—Yes.

8879. When you talk of long-term loans, how many years have you in mind?—10 to 20.

8880. At what rate of interest?—5 per cent.

8881. Simple or compound interest?—It may be simple interest.
8882. Government themselves pay compound interest; why should they charge only simple interest?—If you want to, you could charge compound interest; I do not mind.
8883. I only wanted your opinion?—Government can get money at 4 per cent, and I say they should charge 5 per cent.
8884. You have said that in Surat there are big landlords. One is Mr. Modi, a barrister?—Yes.
8885. How much does he own?—About 2,000 acres.
8886. Taking it at 1,500 acres, how much can he make?—At least Rs. 15, and it may be Rs. 20 an acre. It may be more, but it will not be less than Rs. 15.
8887. With 1,500 acres that means Rs. 30,000?—Yes.
8888. Does he make that?—Yes.
8889. He is a private practising barrister?—Yes.
8890. You say the rate of interest on *taccavi* should not be more than what Government has to pay. How much interest does Government charge now in this Presidency?—6½ per cent.
8891. You think they should only charge 5 per cent?—5 per cent or whatever they have to pay.
8892. Do you think that money before it reaches the cultivator filters through their fingers somehow?—I do not want to make that suggestion.
8893. What is your opinion? We want to find out if this sort of thing happens?—I refuse to make that assertion.
8894. We want your opinion?—I have given that already, in very plain terms.
8895. What is the cost of a well?—From Rs. 400 to Rs. 1,000 or Rs. 1,500 according to the tract.
8896. According to depth?—According to the depth in the tract.
8897. You say fragmentation of holdings is slowly adjusting itself?—Yes.
8898. How?—If I have to divide my property with my brother I will either take it myself or hand it over to him. That is the way things are being done.
8899. But by law?—By mutual understanding.
8900. On page 575 you refer to the Malommedan law of inheritance. There is no such thing; they simply followed the Hindu law, so far as fragmentation is concerned. Tell me something about the rotation of crops. With a holding of 20 acres, what would be sown in the first year?—It depends on the type of land. We have two types of soil. On the black soil it will be cotton and *juar*, and sometimes wheat.
8901. Give me the rotation?—If it is a systematic rotation it will be cotton followed by *juar*.
8902. What do you expect to get out of it?—Our average with cotton is 400 lbs. an acre.
8903. What is the gross value of the income you get from that?—It depends on the market price of the commodity raised.
8904. Take the average rate?—About Rs. 10 to Rs. 15 per acre. Rs. 200 to Rs. 300 for 20 acres.
8905. What is the pay of a *chaprasi*?—About the same.
8906. If you cannot teach them to make more than that, you must not blame them if they go into service, where they have a safe job and no fear of famine and so on?—No, we do not.
8907. If you are to justify the existence of your department, you must teach them to earn more?—We are trying to teach them better farming.
8908. Not more lucrative farming?—Better farming means that.

8909. How much can you teach them to earn?—15 to 20 per cent. more.

8910. That means Rs. 400. If it was an irrigated area, how much would you expect?—We have no such thing. Our black soils are unirrigated, and there are very few localities where the wells are working now.

8911. There is no canal irrigation?—No.

8912. Absolutely none?—In North Gujarat there is one small canal.

8913. *Dr. Hyder*: You do not think it will be a wise policy to control the credit of cultivators by restricting the sale or mortgage of their land?—No.

8914. How old are you?—55.

8915. You have no doubt studied the *sastras*?—Very little.

8916. I wondered whether in your study of the *sastras* you had come across the following passage: "And the Earth said, 'Let no mortal give me away.'" Have you pondered over the meaning of this passage?—I have never studied the *sastras*. My study has been agriculture all my life.

8917. To go back to the panchayets, can you give me the causes of the decay of this institution? I understood you to say in reply to the Chairman that the causes were purely political?—Yes.

8918. The question is important, because everybody is talking of the institution of panchayets. Do you think the India of the present day is the same as the India of old?—No.

8919. Did they have railways in the old days?—No.

8920. Did they have a postal service?—No.

8921. Did they have legislative councils?—No, but something of the same type. There were councils attached to the Rajahs, but I am not a historian and I am not supposed to know all this.

8922. People in the old days did not have Government institutions reaching every village. To-day the humblest cultivator can go to the nearest police station, to the court of the *mamlatdar* or, if not satisfied, to the Collector?—Yes.

8923. Such things did not exist in the old days, so that the people had to fall back on institutions of their own?—Yes.

8924. In view of the changed conditions in India to-day, do you think a revival of the panchayets would be successful?—Yes.

8925. You still think so?—Yes, because the litigation and waste of time involved are much worse than the advantages due to railways, posts and other things.

8926. *Sir Chunilal Mehta*: In answer to the Chairman you said only 3 to 5 per cent. of the boys from agricultural schools go into service?—Yes.

8927. The others go back to the land?—Yes. That is from my Gujarat schools; I do not know about Loni.

8928. You have two such schools?—Yes.

8929. When was the one at Surat started?—In your *régime*, three or four years ago.

8930. You cannot have much experience of what happens to the boys from that school?—Two batches have left. From the other school, which was started in 1919, there have been five batches.

8931. What class of boys attend those schools?—Mostly sons of cultivators.

8932. Do any Bhils go there?—Yes. I think eight to ten boys belong to the backward classes.

8933. These boys of the backward classes have nothing else to fall back on?—No, they must go back to their land.

8934. Anyhow, the number of boys turned out by both your schools is small?—It is limited to 30 students a year.

8935. And these schools have only been going for about five years?—Yes.
8936. You said something about cotton-breeding on your farm at Surat?—
Yes.
8937. When was Dr. Mollison in charge?—In 1900 he went to America, and on his return started cotton-breeding on the Surat farm.
8938. In 1901?—Yes. He taught me as soon as he came to India.
8939. How long was Dr. Mollison in charge of that farm?—Until he became Inspector General, towards the end of 1901.
8940. He was in charge only a few months?—Yes.
8941. Who took charge of it afterwards?—Mr. P. Mehta was there temporarily for two years.
8942. Who came after him?—Mr. Fletcher.
8943. How long was he there?—1903 to 1908.
8944. And after 1908?—Dr. Main was in charge for ten years; then came Professor Patel, who was in charge for two or three years, and since then I have been in charge.
8945. Has there been any change in the method of cotton-breeding since the time of Dr. Mollison?—There was some change after Mr. Fletcher came, about 1908.
8946. Has there been any change since 1908?—No, it has been going on the same lines.
8947. Giving very good results?—Yes.
8948. On page 572 you say post-graduate teaching in agriculture should be introduced in the agricultural colleges. What are you referring to there?—Post-graduate teaching for these agricultural graduates, as in other countries. These people when they go out are not so well trained as we expect them to be. Some of the intelligent men who graduate, if they had two years post-graduate training, would be the best men possible.
8949. Are you referring to practical training?—To training in whatever line they want to take up; practical agriculture, commercial farming, scientific research, agricultural chemistry, botany, etc.
8950. That would fit them for the work of practical cultivation?—Yes. I have suggested practical work for those people who wish to take up commercial farming. They should have two years' training on commercial or Government farms before taking up agriculture. Some of the graduates who have taken to agriculture have lost instead of gained, and they should receive a thorough practical training before they take to actual farming.
8951. With regard to *taccavi*, you say Government should charge the rate of interest at which they are able to borrow, plus establishment charges. Would you also include any allowance for losses on *taccavi* loans?—Yes.
8952. Is it your opinion Government is now charging more than would be covered by those three items?—I think so.
8953. On what data?—It is only my rough calculation. The losses are very few.
8954. How do you know that?—I see it is rigidly collected.
8955. If you look in divisions other than your own you will find there are plenty of losses. You have said that the cultivator who has only a small holding is more efficient and farms better than the big farmer. What exactly do you mean by that?—He is able to take more care of his land and crops; a man with 15 acres can look after them better than a man with 100.
8956. Sir Ganqa Ram: I am cultivating 50,000 acres?—Your conditions may be different; you are doing it on a commercial scale.
8957. Sir Chunilal Mehta: Will a man who cultivates 5 acres show better results than a man cultivating 25 or 30?—A man cultivating only 5 acres is able to find the labour within his own family; he will not want any hired labour. No supervision is required.

8958. How many acres can an ordinary family (a man, his wife and two children) look after properly?—It will vary according to the taluka. In some places 5 acres will be enough; in other, dry areas 20 acres may be required to support a family.

8959. You would rather go in for small plots?—Yes.

8960. After your long experience in the Agricultural Department you say about Rs. 15 an acre is the net return to the cultivator?—Yes.

8961. *The Chairman*: In a dry area?—Yes.

8962. *Sir Chunilal Mehta*: It is almost all dry. People require more than what to live a decent life?—Yes.

8963. What do you propose to remedy this state of things?—To improve their agriculture and increase their yield is one thing.

8964. You say that better seed will only increase the return by 15 per cent?—Better cultivation will give some 10 per cent more.

8965. How much more can you add altogether by your efforts?—By better seed, 10 to 25 per cent more. By better cultivation, proper rotations and manuring, about the same amount.

8966. By all your improvements you might be able to raise the return from Rs. 15 to Rs. 30?—Not beyond that, certainly.

8967. If you could do that, would Rs. 30 be sufficient to attract people to cultivation?—It is not enough.

8968. Then what should be done?—There should be some subsidiary industries for smallholders.

8969. You say nothing about that in your note?—I had no time.

8970. What do you suggest?—There are several side industries. First and foremost there is the keeping of cattle.

8971. Do the cultivators in your Division keep cattle?—Yes, as many as they can maintain on their farms.

8972. *Sir Ganga Ram*: On what percentage of their land do they actually grow crops?—On the whole of it.

8973. Then what do they keep the cattle on?—They grow *juari*, *bajri*, *kadab* and rice-straw.

8974. *Sir Chunilal Mehta*: Cows and bullocks?—The higher people keep buffaloes chiefly; they have some prejudice against keeping cows. They do not castrate the bulls, the progeny of the cows, and so the cows do not pay them.

8975. Do they purchase their bullocks?—Yes. Only the low-caste people keep cows, and then one, two or three at the most.

8976. You consider cattle-breeding is a feasible proposition for cultivators?—Yes.

8977. Is cattle-breeding a possibility in Gujarat?—Yes, except in the most southerly part of the Surat district, where there is heavy rainfall, and which may not be suitable for cattle-breeding.

8978. Is cattle-breeding being taken up more now than it was 10 or 15 years ago?—No; less.

8979. Why?—Because the areas lying under grass have all been brought under cultivation on account of the high price of cotton and foodstuffs, so that they are not able to maintain the number of cattle they had before.

8980. Do not they stall-feed?—No.

8981. What other subsidiary occupations are there?—Poultry, sheep and goats, in the case of low-caste people who have no religious objection. They do that now to some extent, but it requires to be much improved. The poultry are in very bad conditions; very inferior birds are kept throughout India. Then there is spinning and weaving. I do not know about spinning, but I would like weaving to be introduced as far as possible.

8982. Do the cultivators do any weaving now?—Yes.

8983. What kind of cloth do they weave?—When I was a boy all my relations used to weave. Our people are *Desais*, and we used to weave all our requirements.

8984. Has that died out?—Almost.

8985. Why?—Because they do not want to take the trouble. They go to the market and get ready-made clothes.

8986. Do you think with propaganda hand-weaving could be introduced again?—Yes; people are realising they are losing a lot of money by purchasing these things.

8987. What other industries would you recommend?—There are several others which depend on the locality, like lac-making.

8988. *Professor Gangulee*: Do you consider the present standard of the graduate course of the agricultural college is low?—No.

8989. It is quite satisfactory?—Yes.

8990. But you want a post-graduate course added?—Yes.

8991. Is the post-graduate course satisfactory?—It has not been arranged yet.

8992. You have the M.Sc. course at Poona now?—That is different from what I have suggested; I want special training.

8993. You referred to the system of recruitment of agricultural labour in your district. What are the outstanding features of that system?—In former times the cultivator advanced a man sufficient money for his marriage, say Rs. 40 to Rs. 70, and for that the man and his wife used to serve the cultivator for the whole of their lives.

8994. A sort of slavery?—They were fed and clothed by the cultivator and given burial expenses if anybody died. That has been replaced by the contract system with contracts for a term of years, and the money advanced has risen to Rs. 700, and then often the men run away and the cultivators lose their services.

8995. Would you restrict their freedom of movement?—Unless a man has settled with his former master he should not go to another one.

8996. Have you made a study of the exchange question?—No. I have read the newspapers; that is all.

8997. *Mr. Calvert*: Do I understand your view is that so far as agriculture alone is concerned, the poverty problem is insoluble?—I think so. The only solution is for the cultivator to work eight or ten hours a day throughout the year.

8998. *Sir Chunilal Mehta*: Does that apply to irrigated tracts, or only to dry?—In the irrigated tracts they have to work all the year.

8999. *The Chairman*: How long have you known rural India intimately?—At least since I entered the service.

9000. How long is that?—Nearly 30 years.

9001. Have you known the same district through all those years?—I have gone over most of India. I served for six months on special duty in Sind; I served eleven months in the Punjab and then went to the Central Provinces, the United Provinces and Bihar and Orissa with Dr. Mollison on a tour.

9002. *Sir Ganga Ram*: You have served in the Punjab?—Yes, for a year on the cattle farm there.

9003. *The Chairman*: Are you familiar now with the districts you knew intimately 30 years ago?—I know Gujarat very well indeed.

9004. What do you think about the standard of living of the cultivators in that district you know so well?—It has increased to a large extent.

9005. It is higher now than it was 30 years ago?—Yes.

9006. To what do you attribute that?—Outside influences.

9007. I want something more definite?—On account of the railways and other facilities, people get about and see things. They acquire habits like drinking and smoking. Formerly very few people drank tea; now no one will go to work without taking a cup of tea. That is the worst of it. A man who used to have only one coat now requires three or four. Their houses have materially improved.

9008. *Sir Ganga Ram*: Do they eat wheat or *juar*?—It is according to the local produce. Southern Gujarat produces *juar*. If they grow rice, they eat rice; if *bajri*, *bajri*.

9009. *The Chairman*: My colleagues have been enticing you off the main line of my question. So far you have described changes in the habits of the cultivator; what I want to know from you is whether you think the purchasing power of the cultivator has risen in the years during which you have known this district so well?—It increased to some extent up to the outbreak of the War, but very slowly. After the War it increased rapidly, between 1918 and 1924. Now a depression has set in, and their purchasing power has been much reduced. For a year or two it does not matter, but if it continues for five years there must be a contraction in the standard of living.

9010. They are still attempting to maintain the standard of living to which they attained in 1920-21?—Yes.

9011. But if the period of depression continues, that standard will have to be contracted?—Yes.

9012. But you are definitely of opinion that on the whole the purchasing power of the cultivators in Gujarat has risen during the period of 30 years during which you have known the district?—Yes.

9013. Are there more power pumps in Gujarat now than there were when you first knew the district?—There were practically none to start with, and now in one taluka there are more than 100.

9014. Are there any other power machines?—There are now 125 tractors in Gujarat alone.

9015. What has been the effect of the introduction of labour-aiding machinery on the well-being of the cultivator?—If the machinery and spare parts could be supplied, it would materially help them.

9016. Have you ever taken a course in agricultural economy?—No.

9017. You rely on your common sense?—Yes.

9018. *Sir Ganga Ram*: You say "if the agricultural machinery was supplied". Do you mean supplied free?—No.

9019. What is the cost of ploughing with a tractor?—Rs. 10 to Rs. 25 an acre.

9020. For one ploughing?—Yes.

9021. If I undertook to do it for Rs. 5 what would you say?—I would give you a very big contract!

9022. *The Chairman*: What do you propose to do when you reach the moment for retirement?—I would like to go in for private farming. I have already applied to Government and to the Collector of Surat to give me the worst piece of land that they have, which is not occupied by anybody, and I want to show what can be done with it and utilise my experience there. I do not know whether I will get the land, but if I do I want to utilise my knowledge by farming myself, at the same time placing my experience at the disposal of the Agricultural or the Co-operative Department. My sole ambition is to do farming myself.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Tuesday, the 9th November, 1926, at Bangalore.

APPENDIX.

The Vernacular Agricultural School, Godhra, was started in 1920-21. Out of 89 students that were admitted, 68 went successfully through the complete course of the school till the end of 1925-26. Of these successful students 32 are reported to have engaged themselves in their own agricultural pursuits independently, 1 in private agricultural service, 8 in the Agricultural Department service, 4 in other departments, 11 have joined other occupations, and as regards the remaining 12, no definite information is available.

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PATEL, Mr. B. S., N.D.D., N.D.A., C.D.A.D., Professor of Agriculture, Agricultural College, Poona, 8025-8524, (527-540, 571).

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SALIMATH, Mr. S. S., B.Ag., Deputy Director of Agriculture, S. D., Dharwar, Bombay Presidency 6598-6797 (370-380).**AGRICULTURAL INDEBTEDNESS:**

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BOMBAY
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GLOSSARY

Adti, Adatya or Aratya. A broker.

Bajri A small millet (<i>Pennisetum typhoideum</i>).
Bandhara ..	.. Dam.
Bavto (Ragi) ..	.. An inferior kind of millet.
Berseem ..	.. Egyptian clover (<i>Tripolium alexandrinum</i>).
Bund ..	.. Dam.
Chamars ..	.. Workers in leather. One of the depressed classes.
Chaprasi ..	.. Peon (a messenger in the employ of Government).
Chavdis ..	.. Places where village officers hold their office.
Choola ..	.. An oven.
Cutchra (see Kutcha).	
Dalal ..	.. A broker.
Damdopat ..	.. An ancient Hindu provision by which the total interest on a loan may not exceed the amount of the principal.
Dharalaa ..	.. A backward class of cultivators in Gujarat.
Dhoti ..	.. Loin cloth worn by men.
Dokara ..	.. A unit of weight for cotton, usually about 12 maunds or 336 lbs.
Gauthan ..	.. Village site.
Gowrakshak ..	.. A refuge home for cows (lit : a cowkeeper).
Gowshala ..	.. A refuge home for cows (lit : a cowshed).
Gul ..	.. Unrefined Indian sugar.
Guntha ..	.. 1/40th of one acre.
Hamals ..	.. Porters.
Inamdars ..	.. Holders of beneficiary grants of land.
Jamabandi ..	.. An annual account of lands held in a village and the amount of land revenue due on them.
Juar ..	.. The large millet (<i>Sorghum vulgare</i>).
Kacheri ..	.. The office of a Government official.
Kadbi ..	.. Dried straw of jowar (millet).
Kamgar ..	.. Petty Officer.
Kapas ..	.. Cotton with cotton seed still adhering.
Kharif ..	.. Summer-sown (crops).
Kilhanavi ..	.. A way of preserving fodder by plastering the stack with mud.
Koli ..	.. An aboriginal tribe found in Gujarat and in the Deccan.
Kumri ..	.. Temporary cultivation in jungle clearings.
Kunbi ..	.. A cultivator.
Kutchra ..	.. Literally "not solid." Used of country roads, roughly constructed buildings, etc. (Opposite term is "pucca.")
Kutchra ..	.. Refuse.
Mahars ..	.. A depressed class.
Mamlatdar ..	.. The Revenue head of a taluka.
Mote (Mhote, Moth) ..	.. Water-bag.
Nilgai ..	.. Blue buck (<i>Boselaphus tragocamelus</i>).
Nullah (Nallah) ..	.. A water course

Palla ..	.. A measure of varying capacity.
Pancha ..	.. A loin cloth.
Panchayet ..	.. Literally a Committee of five. Used to describe an association of any number of persons instituted for objects of an administrative or judicial nature.
Patel (Patil) ..	.. Headman of a village.
Patidar ..	.. Holder of an ancestral share in village lands.
Patwari ..	.. Village accountant or registrar.
Pinjrapole ..	.. A refuge home for cows.
Rabari ..	.. A caste of cattle breeders.
Rabi ..	.. Winter-sown (crops).
Ragi ..	.. An inferior kind of millet (<i>Eleusine corocana</i>).
Salutri (Salutari) ..	.. A veterinary assistant.
Sari ..	.. A long piece of cloth worn by women as a shawl.
Sastras ..	.. The Hindu scriptures.
Senji ..	.. A forage trefoil (<i>Medicago parviflora</i>).
Seva Sadan ..	.. Literally "home of service." A charitable organization.
Sirkar ..	.. Owner (used as a synonym for the Government).
Sowcar ..	.. A moneylender.
Taccavi ..	.. Advances made by Government to cultivators for agricultural purposes.
Tal (Tahl) ..	.. Dam.
Taluka ..	.. A local revenue division of a district.
Tur ..	.. A variety of pulse (<i>Cajanus indicus</i>).
Vafa ..	.. Division of a field into squares for irrigation.
Zilladar ..	.. Term used in the Punjab for the Revenue Officer in charge of a group of villages. The term corresponds to a Circle Inspector, Bombay.