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Report

of The

Operation of The Department of

Agriculture,

Madras Presidency

For The official year

1909-10



NO 1 NO 9

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF
AGRICULTURE,

MADRAS PRESIDENCY

FOR THE OFFICIAL YEAR

1909-1910.

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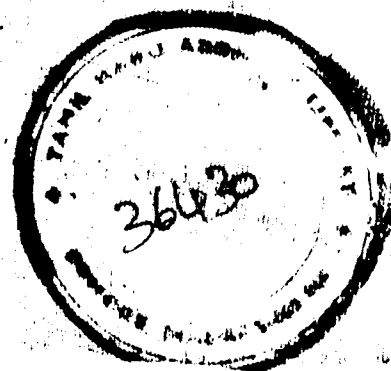
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Report on the College of Agriculture, Coimbatore	..
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I
REPORT
ON THE
OPERATIONS OF THE DEPARTMENT OF AGRICULTURE
FOR
1909-1910.

I.—STAFF.

During the year under report I was in charge of the office of Director of Agriculture during the whole year, with the exception of the period of two months' privilege leave of which I availed myself from April 14th to June 15th. Satisfactory progress has been made during the year with the organisation of the Department.

2. In G.O., No. 2137, Revenue, dated 4th August 1909, two appointments of Assistant Directors were created, and M.R.Ry. D. Ananda Rao, B.Sc., was appointed to one of them in G.O., No. 2919, Revenue, dated 22nd October 1909, on one year's probation. His head-quarters have been fixed at Samalkota. Mr. R. D. Anstead, the newly appointed Scientific Officer to the United Planters' Association of Southern India, joined his post on 12th May 1909. He has been recruited as a Member of the Indian Agricultural Service for five years, and placed at the disposal of the United Planters' Association of Southern India in regard to his tours and work, remaining subordinate to the Director of Agriculture in all matters regarding his pay, leave and discipline. His head-quarters have been fixed in Bangalore. In November Mr. Cecil Wood was appointed Principal of the Agricultural College, in place of Mr. Shepperson, who left at the end of his three years' agreement, and Mr. G.R. Hilson, B.Sc., was recruited in place of Mr. Wood and joined his post as Deputy Director of Agriculture, Northern Division, on 14th March 1910. M.R.Ry. Ananda Rao was in charge of the office of Deputy Director of Agriculture, Northern Division, during the interval between the departure of Mr. Wood in November and the arrival of Mr. Hilson in March.

The sanction of the Secretary of State to the appointment of a Mycologist for the Madras Presidency was conveyed in G.O., No. 2871, Revenue, of 19th October last. Mr. W. McKae, M.A., B.Sc., was appointed to the post and reported his arrival in Madras on 5th January.

Mr. Harrison was confirmed in his appointment as Madras Agricultural Chemist in G.O., Mis. No. 3407, Revenue, of 11th December 1909, and Mr. Sampson, as Deputy Director of Agriculture, Southern Division, with effect from 17th April 1910, in G.O., Mis. No. 863, Revenue, of 19th March 1910.

3. I spent 172 days on tour and visited all the agricultural stations. I also attended the annual meeting of the United Planters' Association of Southern India at Bangalore in August and the Board of Agriculture at Pusa in February. Messrs. Wood and Harrison accompanied me to Pusa.

4. There are still seven vacancies in the grades of Farm Managers and Assistant Farm Managers, which there is no prospect of filling at present.

In G.O., No. 2595, Revenue, dated 20th September 1909, the services of M.R.Ry. K. Rangaohariar were placed at the disposal of the Agricultural Department for a period of five years, to assist in the teaching and other botanical work at Coimbatore.

II.—SCIENTIFIC AND NATIONAL ENQUIRY.

A.—ENTOMOLOGY.

5. There are now three trained Entomological Assistants, the third, M.R.Ry. K. S. Padmanabha Aiyar, having returned from training at Pusa in April last. One is permanently engaged at the Agricultural College for teaching the students and field work on the Central Farm and in the vicinity. His draft lectures are sent for revision to the Imperial Entomologist. The other two Entomological Assistants are sent to investigate outbreaks of pests in the different parts of the Presidency, when they are reported, and suggest practical remedies, the intention being to have one Assistant available for each of the Deputy Directors. The chief pests investigated this year have been the paddy stem-borer in several districts, the grasshopper in Bellary and Tinnevely, and the hairy caterpillar in South Arcot.

The latter is a serious pest, and as the light trap has been proved to be an efficient protection, its use was demonstrated in the affected villages and a leaflet has been prepared for distribution in the vernacular, giving a brief life history of the pest with an illustrative plate of the different stages of the insect itself, with instructions for the use of the light trap.

For the grasshopper in Tinnevely, which was unusually bad this year, and entirely ate off some of the early crops, the sweep-bag has been found useful, and the Entomological Assistant made a bag and demonstrated its use to the ryots near Koilpatti farm. Further investigation into the paddy stem-borer will be made in the current year.

6. Experiments will be made on the Central Farm with the eri silk worm, which feeds on the leaf of the castor plant, to see if it is likely to pay. The cocoons can be reeled like the mulberry silk worm, but can easily be spun like cotton, and the silk produced is very durable.

7. A large number of insects were collected and identified and notes made on their life history and distribution. What is required now is the application of the knowledge acquired to preventive or remedial measures in the field. This is, of course, the only practical test of the utility of the work. The difficulty of dealing with field pests is enhanced by the want of co-operation among the cultivators, but special attention will be paid to the matter in the current year.

8. Though Mr. Lefroy was unable to visit the Presidency during the year under report, he has since come and thoroughly inspected the work of the Assistants and the collections. The best thanks of the Department are due to him for the continual help received throughout the year.

B.—MYCOLOGY.

9. The Officiating Imperial Mycologist visited the Wynaad in November at the request of the Planters' Association to enquire into the Nectria fungus disease of pepper and arranged in consultation with the Scientific Officer a series of experiments with some practical remedies. Further experiments will be required to ascertain the life history of the fungus and the manner of its propagation.

On his way back to Pusa he visited Bapatla to investigate the palm disease reported to exist there, but found that the deaths of the trees were not due to the Gôdâvari fungus.

10. The Mycological Assistant M.R.Ry. S. Sundararaman completed his training at Pusa on 31st March and returned to Madras.

Since he joined his appointment Mr. McRae has spent some time in the Gôdâvari and Kistna districts in inspecting the operations for the eradication of the palmyra fungus. He has begun experiments on the smut of cholam, and has visited

the Nilgiris to investigate the potato disease, which is reported to have been worse than usual this year. Several other important lines of work are awaiting investigation, and it is a matter for congratulation that Madras has been the first among the Provinces to obtain its own Mycologist.

11. *The Gôdâvari fungus disease operations.*—During the year Rs. 12,454-6-11 was spent on the measures for the eradication of the disease in Gôdâvari and Rs. 659-3-1 in Kistna, an establishment of nine Revenue Inspectors with peons having been sanctioned for work in the latter district in G.O., No. 2958, Revenue, dated 29th October last.

The question of continuing the operations is under the consideration of Government at the time of writing. I consider that the operations in the Gôdâvari district have caused a diminution of the disease and have prevented it from spreading to new centres. In the Kistna district, where operations have only just begun, the disease has spread rapidly. It is hoped that Mr. McRae may be able to throw some light on the manner in which the disease is propagated, so that we shall no longer be working in the dark.

At the close of the year Mr. W. K. Cheen who has been energetically conducting the operations throughout the year, was transferred to other duty, and M.R.Ry. S. V. Narasimachary has been appointed to direct the operations.

C.—SEED AND OTHER PRODUCTS SUPPLIED TO AND RECEIVED FROM OTHER PROVINCES AND ABROAD.

12. Two new seedling canes, numbered B. 3412 and B. 6159 were received from the Superintendent of Agriculture, Barbados and have been planted at Sanaalkota. Dr. T. Guthrie of the Colonial Sugar Refining Co., Sydney, kindly brought two new canes from Fiji, which have been planted at the Taliparamba farm. All are reported to have germinated successfully. Three varieties of groundnuts were obtained from the Superintendent of Agriculture, Fiji.

A small quantity of Georgian cotton seed was kindly supplied by the American Consul in Madras, and has been sown at Palur. The results are not yet to hand. The new Transvaal Cumbas have done very well at Coimbatore. Three dozen plants of a fine variety of orange from Northern Burma, known as the Hsipaw orange were imported and distributed in the Nilgiris, where they were planted in Sim's Park, Coonoor and Barliyar, and by Mr. Oakes and Mr. C. Gray. Others were sent to Mr. Michie Smith at Kodaikânal and Mr. P. G. Tipping in Coorg. The new varieties of maize imported from the Transvaal are doing well, and seed has been distributed to selected ryots in Tanjore and North Arcot.

Supplied to other countries.—700 lbs. of Malabar hill paddy was supplied to British East Africa, ten bushels of fine samba varieties to the Ceylon Agricultural Society, and also a representative collection of the chief paddies, dry grains and fodders cultivated in Madras. Two samples of dry land paddies from Gôdâvari were supplied to the Deputy Director of Agriculture, Bombay. Numerous other requisitions for small quantities of seed and produce were complied with.

III.—SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL DIRECTION.

A.—BUILDINGS AND LAYING OUT OF FARMS.

13. The Coimbatore College was completed during the year under report, and formally opened by His Excellency the Governor on 14th July. The construction of a boundary wall at a cost of Rs. 12,400 was sanctioned in G.O., No. 1054 W. of 27th September 1909. Good progress has been made with the wall, which, when completed, will greatly improve the appearance of the College.

A sum of Rs. 1850 was sanctioned in G.O., No. 81 W. of 12th February for widening the Lawley Road. The double avenue of *Acacia* and *Bauhinia* trees is coming on well. An estimate for the construction of a pot plant culture house at a cost of Rs. 11,200 was sanctioned in G.O., No. 887 W. of 26th August 1909. Estimates amounting to Rs. 32,900 for the water-supply of the College, and book cases for the Library were sanctioned in G.O., No. 362 W. of 16th April 1910.

Proposals have been submitted for the construction of a dairy so that the students may be taught the elements of dairying.

On the Agricultural stations no important works were executed, with the exception of the seed store at Koilpatti which was almost completed in the year.

B.—CROPS.

14. *Agricultural stations.*—As before, attention has been concentrated on practical work on the main food and industrial crops, paddy, cotton, sugarcane and groundnut occupying most of the time of the department. The efficiency of the Farm Managers and Assistant Managers is improving and satisfactory progress has been made with all the chief lines of work.

15. *Sugar-cane introduction.*—In Godavari the Mauritius canes have practically displaced the old canes, which are now seldom seen. There was keen competition this year again for the new B. 208 cane. One hundred and twenty applications were complied with, the canes being distributed over as many different villages as possible. It has also been introduced into Malabar, South Arcot, Vizagapatam and Coimbatore. This cane, which is now cultivated in many parts of the world, has a very high sugar content, and is a most valuable acquisition to the country. In South Arcot very satisfactory progress has to be recorded. Though it is only three years since the Red Mauritius canes were sent there from Melrosapuram it is estimated that there are nearly 700 acres under that cane in the Cuddalore taluk and the cane cultivation which fell to 180 acres in 1908-1909 and seemed on the point of extinction, has increased from 466 acres to an estimated area of 1,000 acres in the current year, three quarters of which is Mauritius cane introduced by the Department. This rapid expansion is due to the success of the experiments conducted with the new canes at Nellikuppam referred to in paragraph 16 of last year's report, and a very interesting point in this connection is that about a quarter of the area planted is on irrigated dry land watered from wells. The new canes give about twice the produce of the old and their harder rind makes them almost proof against jackals, a source of great loss before.

16. In South Canara and Malabar the same canes have been distributed to selected cultivators. In the former district the cultivators are familiar with cane cultivation, but the local varieties are poor and the method of cultivation imperfect. Selected cultivators have been supplied with Mauritius canes, and trained coolies sent, in company with the Farm Manager, to show them better methods of cultivation. In Malabar the cultivation of cane is practically unknown, and all the details of cultivation, as well as the manufacture of jaggery, have had to be taught the people from the beginning. The prospects are very promising. The canes grow to an extraordinary size on this coast, and though the juice is not so good as on the East Coast, good jaggery can be made from it. The increased profits to the cultivators from the cultivation of the new canes more than equal the whole cost of the department.

17. *Sugar-cane experiments.*—The manurial experiments at Samalkota show that the addition of superphosphate and potash, with and without lime, in addition to castor cake, does not pay. The cultivation experiments show that the only improvement which can be recommended to the Godavari cultivator is the planting of his canes in rows, instead of scattering them about the field at random, which increases the cost of the subsequent cultivation. There is still some disease in the district, but on a small scale. Experiments at Taliparamba have shown the value of deep draining. The canes grow better and withstand drought. This has been confirmed by the experiments at Nellikuppam. At Palur it has been shown that the common belief of the ryots that the canes deteriorate after flowering is incorrect.

18. *Groundnut introduction.*—Good progress continues on the West Coast. Mr. Sampson and I visited many of the plots in Malabar and South Canara. During my visit to the latter district, I found that groundnut oil was being regularly consumed in the district, being imported from other places. To encourage the local cultivation, it was arranged to send an Assistant Manager with a trained cooly up there to show the local oil makers how to extract oil from the groundnuts grown in the district. In the north of the district a large variety of groundnut has been imported from

Vingerla in Bombay and seems to suit the local conditions better than the Mauritius nut, and is more palatable to eat. The crop has now had a fair start in the district, and should establish itself gradually in the local cultivation. At Taliparamba, on the dry or 'modan' land a yield of 1,644 lbs. of dried nuts per acre was obtained from a plot to which eight cart-loads of ashes were applied. The unmanured plot gave only 320 lbs. This shows that manuring will be necessary if the crop is to succeed on the West Coast, and may be the explanation of the poor results obtained in many places. The Agricultural Chemist considers that, in view of the deficiency of lime in these laterite soils, superphosphate may be useful. Experiments will be made with it during the current year.

19. In the returns for the Presidency a decrease is shown in South Arcot, but an increase in other districts. It is a common complaint in South Arcot that the crop is not so productive as before. The land appears to be "sick" of the crop, and, as an alternative, Cambodia cotton has been tried on the Palur farm this year. On good irrigated land this promises to give a return of Rs. 150 per acre. It has attracted much attention, and many cultivators intend to give it a trial next season. Reference to this crop will be made again below.

20. *Groundnut experiments.*—As pointed out in the Palur report, the greatest obstacle to the more rapid spread of the crop is the tendency in districts where the crop is new to grow it year after year on the same land. The cereal rotation experiments at Palur aim at discovering the best rotation crops to grow along with groundnut. They show so far that the rotation usually followed in South Arcot, of cumbu and groundnuts, is the best, and the mixed crop gives a larger return than either crop grown alone.

21. *New varieties.*—The experiments at Palur show that on dry land without irrigation Big Japanese and Tatas have given a larger yield than the local nuts for the last three years, but on irrigated land Madagascar and Senegal were the best this year. The local nut still contains more oil, and cannot yet be said to have been displaced. It is, however, satisfactory to know that several other varieties have been found which are sufficiently good to take its place if it should deteriorate.

22. *Cotton.*—(a) *Improvement of seed and seed distribution.*—The work under this head falls into two divisions: (1) the growing and distribution on a large scale of Karunganni seed in Tinnevely and Northern cotton in Kurnool and (2) the improvement of the local cottons in all the districts where we have farms by separation of different varieties, selection and breeding. For growing Karunganni seed 550 acres of private land were leased on the following terms. The owner guarantees that cotton was not grown on the land the previous year. He ploughs the land four times in the hot weather and pens sheep on it. The seed is supplied by the department and sowing and bullock hoeing done by the department with cattle hired from the ryot. The rest of the cultivation is attended to by the ryot.

In the previous year 263 acres of land had been taken up in Tinnevely for growing Karunganni cotton, and 140,000 lbs. of pure seed was available for distribution. Seed depots were opened in 37 villages and 15,600 acres were sown. The last three seasons have been dry, and favoured the Karunganni variety, with the result that these operations have had a greater success than was hoped for. All through the southern part of the district Karunganni cotton now predominates, and it is estimated that 80,000 acres were sown with pure Karunganni last year. In this tract it appears to give a better crop than Uppam. The lint is of much better quality than that of Uppam. It is, therefore, clear that the re-establishment of Karunganni has been of great pecuniary advantage to both the grower and the spinner, though it is not possible to estimate the exact amount. In the year under report, 550 acres of seed farm were sown, and in future it will be possible to confine the seed distribution to seed grown on the seed farms. These are supplied with seed grown on the Koilpatti farm, where the crop is being improved year by year. By this means a continuous improvement can be effected in the district cotton.

The trials of the different varieties at Nandyal showed that there was little to choose between White Northern and Gadag, though the former was slightly better. Arrangements were therefore made to sow 135 acres of seed farm with this variety;

the seed from this will be available for sowing in the current year. The reports received from the Buckingham Mills showed that cotton grown from this seed is decidedly better than that from the ordinary ryots' crops.

Plant improvement.—The first object of these experiments is to increase the profits of the cultivator. This is done by producing a plant which gives a higher percentage of lint to seed than the local varieties. One village which used farm seed last year sold its crop at Rs. 2 per candy of kapas over the current price on account of its higher ginning percentage. The plant must also be productive and well-shaped, so that it may not be blown about by the wind or trail its lower branches on the ground, thereby spoiling the cotton. The second object is to improve the quality of the cotton, and thus enable the grower to get a better price, and the local mills to turn out a higher class of goods, more capable of competing with the imported cloth. Differences of seasons cause variations in quality and percentage of lint every year, and so some years will be necessary before it can be claimed with certainty that an improved cotton has been produced. At Koilpatti, however, yearly selection of the best plants, and also crossing *inter se* have produced a variety which gives as much as 34 per cent. of lint, 7 per cent. more than the local crops, and another variety with a staple which has been pronounced by the mills as equal to Georgia Upland and fit for spinning 40^s twist. Further trials on a larger scale will be required to confirm this.

Work on the same lines has been going on at Nandyal, Hagari and Bellary. Single plants are selected, expert opinion is obtained on the lint and the finally selected plants are being cultivated till a sufficient quantity of cotton is available to enable spinning tests to be carried out. As the best experts cannot pronounce a final opinion till at least a bale (400 lb.) is available, several years are required before the real value of the selected plant is known. In the meantime, other selections are being made, so that a constant succession of selected strains may be available. The general opinion is that this line of work holds out more promise of solid improvement than any other. Pending the results of this scientific work, the effect of even the rough selection of the best plants in every field every year has already produced a considerable improvement in the general farm crops at Koilpatti and Nandyal, the seed from which can already be distributed to the ryots with great benefit to the general crops of the districts.

Cambodia cotton.—This cotton, which is an acclimatised variety of American, has come into prominence of late years as a "garden" crop in Tinnevely. On mixed and red soils, with occasional irrigation, yields hitherto thought impossible in India have been obtained, and thousands of acres are now under this crop. Attempts are being made to introduce it into other parts of the Presidency. The sudden rise into importance of this cotton has a double significance. In the first place, the lint is superior to that of any of the indigenous cottons, and will enable the Indian mills to produce yarn and cloth of better quality than is possible at present. The second point is that it can be grown on land unsuited for the indigenous cottons, and gives a far higher yield. If the hopes which are now, with good reason, entertained about it should be fulfilled, it will increase the production of Indian cotton, a matter of importance in view of the world-wide scarcity of raw material from which the industry is suffering. As mentioned above, the experimental plot at Palur has given good results, the produce being more than a bale (400 lb.) of clean cotton per acre. The co-operation of two European Firms has been secured for the extension of the crop.

At Coimbatore, the Government Botanist has begun experiments on Mendelian lines with this cotton, with a view of combining the good points of this and other similar acclimatised varieties, and the first year's work justifies the hope that success may be attained.

23. (b) *Improvement of cotton cultivation.*—The introduction of the drill system of cultivation in Tinnevely continues to make satisfactory progress. I inspected some of the chief drilled areas with Mr. Sampson in January, and everywhere the crops were better than those sown broadcast, the characteristics of the drilled fields being the evenness of the whole field, due to good and uniform germination, and the vigorous growth of the plants, due to the frequent subsequent cultivation, which

conserves the moisture in the soil. Including the seed farms, 2,100 acres of land were sown with the drill this year. On the Koilpatti farm, cumbu was sown with the drill this year for the first time, with good results. A number of cultivators were brought to see the crop, and decided to sow their own crops in this way next season. This should give a further stimulus to the movement in favour of drilling, as cumbu is the chief food crop of the cotton growing tracts.

I questioned several cultivators as to the advantages gained by the use of the drill on their lands. The general opinion was that there was a saving of Rs. 1-8-0 in cultivation expenses per acre, and a gain of half a pothi of kapas of crop. The value of half a pothi is at present Rs. 16. In view of the fact that drilling enables precious time to be saved at the sowing season, and that drilled crops are, to a large measure, protected against drought, I believe that this estimate of the gain by drilling is on the safe side. On the 2,100 acres drilled last year, therefore, there would be in a normal season a gain to the cultivators of Rs. 36,750. The total net cost of all the operations in the Tinnevely district, including the cost of the Koilpatti farm, during the year was Rs. 11,875. The success which has attended these operations is due to Mr. Sampson's efficient organisation and management, and to the active and intelligent supervision of the district work by M.R.Ry. A. V. Tirumuruganatham Pillai, Manager of the Koilpatti farm. The difficulties attending the introduction of an entirely new system of cultivation, however successful it may be, are very great.

24. *Premia for growing pure cotton.*—In G.O., No. 2415, Revenue, of 1st September, the system of granting premia for growing practically pure crops of cotton was given up, as it proved ineffectual.

25. *Paddy experiments.*—The work on paddy consisted of the trial of new varieties, spacing and manuring experiments, and experiments with seed-beds and transplantation. Space does not permit of more than a brief outline of the work here. The fullest account will be found in Mr. Wood's Samalkota report, which deserves a careful perusal.

Varieties.—There are two difficulties in introducing new varieties of paddy. The first is that the people are accustomed to eat a certain kind of grain and do not care to try new kinds. The second is that the change of conditions causes great variations in the crop, which sometimes assumes several new forms. This has been specially the case with banku. Further selection then becomes necessary if the character of the variety is to be maintained. With the exception of banku, which has given very good results both at Palur and Samalkota, there is no new variety which seems at present likely to make a position for itself. The introduction, acclimatisation and testing of new varieties will always remain a useful line of work, as it is impossible to suppose that the present distribution of varieties is the best possible.

The spacing and green manuring experiments are now more of the nature of practical demonstrations than experiments. The results from small plots on the Government farms naturally do not always give consistent results, and in some cases three or more seedlings have given better results than singles. It is noticeable, however, that cultivators who have tried single planting seldom fail to express satisfaction with the results. On the Samalkota farm the standard planting is single seedlings 9 inches apart. The Samalkota seed rate is 6 lb per acre. In Gódavari the local seed rate is 70 lb per acre. In many districts it is double this. As Mr. Wood says in his Samalkota report: "These figures surely give room for thought, and make it a matter of no doubt that very large economies could be effected in every district, some more, some less, in the matter of seed rate."

26. Referring to G.O., Mis. No. 918, Revenue, of 24th March, the following steps have been taken to extend the knowledge of this system. At Palur, Samalkota, Taliparamba, Nandyal, and in the villages round Hagari, arrangements were made to demonstrate the advantages of the system on plots of ryots' land. At Palur and Nandyal several plots on ryots' land were planted in this way last year, and the good results obtained by those who tried it will influence many others to follow

their example this year. It is the regular practice, on all the farms, for the Managers and Assistant Managers to visit the neighbouring villages as often as possible, and advocate this among other improvements. Several vernacular leaflets have been issued during the last three years describing the advantages of the system and giving simple instructions how to carry it out. At the beginning of the current year three specially selected subordinates were sent on a lecturing tour in Tanjore with a large supply of Tamil leaflets on single planting and green manuring with a view to popularize the system. Reports received up to the time of writing show that the improvements recommended will be carried out on thousands of acres this season. Progress is also being made with single planting in Tinnevely and South Arcot. At Coimbatore the ryots in the vicinity of the farm have reduced their seed rate by one-half, after seeing the success of the farm system of cultivation. Many cultivators in Tanjore who have adopted single planting have reduced their seed rate from 40 to 50 M.M. to 3 M.M. per acre, no inconsiderable saving, when the enormous area under paddy is taken into account. In Gódvári the Collector was asked to order the Tahsildars to visit the Samalkota farm when the paddy crops were ripe and bring a few of the best cultivators with them. I happened to be there when several of these parties came and I showed them the experiments. They appeared to be satisfied that the crops, which were all singly planted, were better than their own. Many of them ordered large quantities of seed and promised to try single planting next year. Articles are constantly published in the English and Vernacular Press on the same subject.

27. A suggestion is made by Mr. Sampson in his Palur report that one reason for the success of economic planting is that the free movement of irrigation water, with the consequent aeration of the soil, has much to do with the growth of the crop and its yield. In a thickly planted field the circulation of the water is impeded. More water would, on this supposition, be required for a thickly planted crop. The question is one of great importance, and will be investigated as soon as possible. It is well known that moving water, even if shallow, is better for the crops than water which is deep but stagnant.

28. The green manuring crops at Coimbatore, Palur, Samalkota and Taliparamba gave good results. The Taliparamba experiments show that the productivity of the Malabar wet lands can be almost doubled in a short time by the use of green manuring, without any great outlay or additional expense in cultivation. This would go far to make Malabar self-supporting in paddy, which is far from being the case at present.

When sunn hemp can be got to grow, no better green manure could be desired, but it is very subject to insect attacks and requires protection from cattle. *Sesbania aculeata*, a plant much used in Bengal for green manuring, has been tried during the past year at Palur and gave very good results. Unlike sunn hemp it will grow on land which is slightly saline. It produces a very heavy crop, it is thereby and unpalatable to cattle, and seems to suffer little from insect attacks. It is being tried at Coimbatore, Palur, and Samalkota this year, and arrangements are being made to procure a larger quantity of seed. There is little doubt that it will prove a valuable acquisition. The plant is indigenous and grows wild in many parts of the Presidency. Green manuring is little practised in Tanjore, and with a view to popularise the practice Rs. 1,500 worth of wild indigo, sunn hemp, and indigo seeds were purchased for sale. The whole stock was disposed of in a short time. This year a sum of Rs. 5,000 has been provided for the same purpose. It is hoped to create a demand for the seed, and then hand over the business to private enterprise. Very useful work has been done in this and other directions in the Tanjore delta by Farm Manager C. Narayana Aiyar, who has been placed on special duty to study the paddy cultivation of Tanjore and see what improvements can be effected.

The Hagari experiments in irrigating black cotton soil have been given up, but the results obtained are worth recording. They are, briefly, that land of this description requires heavy manuring with green leaves for several years before it will yield even moderate paddy crops. It also requires a liberal water supply. The action of the green leaf is partly chemical and partly physical, and it cannot be replaced by cattle manure for the purpose of bringing this land into condition to grow paddy.

29. *Pati Mannu substitutes*.—Good results were obtained from the mixed fertilisers applied in the previous year, and in the year under report a series of experiments in duplicate plots were laid down in five villages to determine whether

any of the elements supplied in the mixtures could be omitted, and thus the cost reduced. A similar experiment was laid down at Coimbatore. These will have to be continued for a good many years before any definite result can be arrived at. All that can be said from this year's working is that superphosphate appears to have a greater effect than potash. If subsequent results confirm this it will be possible to reduce the cost of the fertiliser, as potash is far more expensive.

At Uppalur the cumulative and residual experiments with mixture No. 1, containing bone meal and potassium sulphate, showed that the effects of this manure last for at least two years, which means that the cost per acre of the manure will be halved. In the current year, in addition to the standard experimental plots, demonstration plots of a complete fertiliser have been arranged for, in a number of different centres. It is believed that with the present price of paddy it would pay cultivators to use a comparatively expensive fertiliser, when *pati mannu* is not available. In some places ryots already apply two and even three candies of *poonac* per acre to paddy, costing Rs. 15 per candy. Of the fertilisers tried at Coimbatore far the best results were obtained by milled-fish, at a cost of Rs. 16 per acre. I believe that a great increase in the consumption of concentrated fertilisers may be expected in the near future.

30. *Second crop experiment in Gódvári*.—The experiment described in paragraph 28 of last year's report, of planting the second crop early to save the waste of water involved by the present system, showed that the ordinary "Dalwa" and Banku paddy will not succeed if so sown early. A fair crop, however, was obtained from Garike Sannavari. The actual weighments are not yet to hand. Trial will be made again this year with this and other varieties.

31. *Fibres*.—The present state of the Hindupur fibre experiments is detailed in the administrative report of the Northern division. The estimated yields of fibre from the experimental cuttings made this year gave from 200 to 300 lbs. per acre. Further investigation of the subject points to the fact that for successful production of fibre on a commercial scale there must be a combination of several conditions, chief among which is an abundant supply of cheap and efficient labour. It is doubtful if these conditions are present at Hindupur.

The change of Deputy Directors during the year prevented a definite conclusion regarding this plantation being arrived at. A report will be submitted during the current year.

32. *Ridge and furrow irrigation*.—These experiments at Koilpatti again showed a profit in favour of the system in the rainy season, and it is satisfactory to read that several of the onion-growing villages in the neighbourhood are adopting the practice. At Coimbatore a saving of water was effected by the ridge and furrow system, but otherwise the results were inconclusive.

33. *Saline land experiments*.—In his note prepared for the saline land committee at the last Board of Agriculture, Mr. Harrison reviewed the saline land question as far as it concerned this Presidency, and showed that the question here was one of very minor importance, and that the methods of reclaiming saline land have been thoroughly worked out in Egypt and America. It is now a mere question whether the application of these measures, which consist of a system of flooding and draining followed by suitable cultivation, would be repaid by the value of the land. Large areas have been and are still being reclaimed by the ryots when the demand for land is keen enough, by frequent floodings, and the application of bulky organic manures, and by growing suitable crops on the land.

34. During the year I submitted my report on the Ponnalur tank, and recommended that those who wished to grow wet crops should be permitted to do so on payment of the full rates. It was decided to await the results of fasli 1319 before coming to a final decision in the matter.

35. *Pepper*.—The season was a favourable one, and the improvement in the pepper gardens at Taliparamba continues. Owing to differences in soil, aspect, elevation, etc., the plots are uneven in quality, and hence it would not be safe to place too much reliance on the comparative results. It may be said that green-manuring is not very successful, as the shade of the garden is too heavy for the green-manuring plants to grow well. The most successful manures are fish manure, and

lime and leaf-mould. The Mycologist proposes to conduct experiments here on the Wynaad fungus disease this year. The general result of the station may be summed up by saying that it demonstrates that good cultivation will restore even a poor garden to a good condition. The local custom is to abandon a garden when its production falls off and take up a new piece of land. This will not be possible for ever.

36. *Tobacco experiments.*—In Government Orders, No. 1551, Revenue, of 8th June 1909 and No. 137, Revenue, of 14th January 1910, Government sanctioned the lease to Mr. T. H. Barry of fourteen lankas at a rental of Rs. 8,557 per annum for ten years in order to secure to him the continuous possession of land necessary for his experiments. I visited the lankas in March. The north-east rains on which the tobacco crop depends were almost a total failure this year. In view of this, the tobacco was much better than I expected. The experiment consists of an attempt to grow wrappers for Indian cigars from Sumatra tobacco grown on the lankas. It is evident that the difficulties in connection with the cultivation of the crop have been successfully surmounted. The quality of the finished product depends, however, on the subsequent processes of drying and fermentation. Last year's crop has not yet been fermented. If Mr. Barry is successful in this, a new industry will have been opened up, the prospects of which have been greatly improved by the recently imposed import duties on tobacco. At present all superior kinds of Indian cigars are covered with imported wrappers made from Sumatra leaf. Incidentally, Mr. Barry is introducing improvements into the local cultivation. A green manuring crop of sunn-hemp had been grown on one field with very good results.

37. *Ganja.*—At the request of the Abkari Department one acre of ganja was cultivated this year on the Coimbatore farm. The cultivation was attended to by the Abkari Department and the results are not available here, but are believed to have been satisfactory.

38. *Implements.*—At present it is thought that there is little scope for the introduction of new implements. A number of Messrs. Massey & Co.'s light iron ploughs have, however, been sold by the Manager on special duty in Tanjore, and endeavours are being made to get the sale taken up by a local agent. A small Archimedian screw water-lift has been tried with good results for low lifts in Tanjore. At Palur there is a fair demand for the triangular harrow for dry land cultivation, and for the modified form of the Scind plough for dry lands.

39. *General.*—At the reorganization of the department three years ago both the Deputy Directors were new to the country and people. They have now gained a fair knowledge of both. Their subordinates had, many of them, been working for years in the Revenue and other departments, and forgotten what they had learnt at Saidapet. The Deputy Directors have devoted special personal attention to the training of their subordinates, realising that the efficiency of the agency through which the cultivators are to be approached, and the farms managed, is of the utmost importance. In consequence I am glad to be able to report a very marked improvement in the work of the staff. They have gained a thorough knowledge of the local cultivation round the farms, and are on intimate and friendly relations with the ryots. The latter have lost what suspicions they had regarding the work of the department. They take a keen interest in the farms, visit them in increasing numbers, buy large quantities of seed from them, and, in many cases, adopt the improvements recommended by the department. Much more rapid progress may be looked for in the near future. Definite programmes of practical work outside the farms have been drawn up for each farm and the Manager submits a list of the improvements to be introduced on the ryots' lands during the year.

40. *Bulletins, etc.*—Bulletin Nos. 60 and 61 on the cattle of Southern India by Colonel Gunn, and on improvements in paddy cultivation at Sivagiri by Mr. Lonsdale were issued during the year. Vernacular leaflets were published on banku paddy, the uses of the harrow, cotton cultivation, single planting of paddy, manuring in the Kistna delta and green manuring. Notes have been sent to the Vernacular Press on the use of the seed drill for sowing cotton, seed selection, on pepper and on Cambodia cotton. Occasional notes and articles are published in the English Press. Notices were also published in the district gazettes on the facilities

afforded at Coimbatore to landowners for getting reports free of charge on their soils and manures by the Agricultural Chemist. A large number of samples were received for analysis in response to this. The special object of this was to draw attention to the value of oil-cakes and bones, which are now exported in such large quantities.

The Agricultural calendar was published as usual in English, Tamil and Telugu.

A free copy was sent to every Elementary school. The Government is considering the question of supplying it to village officers.

C.—AGRICULTURAL ASSOCIATIONS, SHOWS, ETC.

41. Agricultural exhibitions and cattle shows were held at Ongole, Madura, Kizhur, Kalyandrug, Ellore, Pithapur, Berhampur and Kottavals.

Little can be said regarding the work of the Agricultural Associations. In Malabar and South Canara, under the direct management of the Collectors and Divisional Officers, good work has been done, especially in the introduction of ground-nut and sugarcane. The Kumbakonam Association demonstrated the single planting of paddy. Most of the associations are inactive. The usual state of affairs is that the Honorary Secretary is a vakil, who is an enthusiastic amateur. The members neither pay their subscriptions nor take any interest in the association. I am consulting all Collectors regarding the best way to reconstitute the associations on a more practical basis. Little can be done till there is a representative of the Agricultural Department permanently stationed in each district, to direct the efforts of the associations, visit the members, and help them with expert advice. It has not been sufficiently recognised in the past that ryots, whose profession is agriculture, place no confidence in advice given by amateurs, even though it may be sound in itself. It is not sufficient to tell them what to do. They require also to be shown how to do it. Some years must necessarily elapse before trained men are available for every district. I am considering how a beginning can be made.

IV.—BOTANY.

42. The report of the Government Botanist has already been submitted. M.R. Ry. K. Rangachari, who was appointed to the post of Assistant in Economic Botany, joined his post in October. Most of the time of the Government Botanist was occupied in teaching. Good progress was made with the laying out of the Botanic garden, and the work of improving the indigenous cottons has been taken up. An attempt is being made to combine the erect habit and early maturity of the Bourbon with the many good points of Cambodia, and the first year's work shows that the characteristics are "Mendelian", and that there is, therefore, a possibility of success. Following the lines successfully adopted for the improvement of wheat in Australia, the Government Botanist is studying the cumbu crop, with the idea of obtaining a variety with shorter straw. The straw of cumbu is very poor fodder, and has little value. A variety with shorter straw would be more drought resistant. The second year students completed their Botany, and were examined in March by Mr. Martin Leake of the United Provinces with the Government Botanist. All except four qualified for the diploma.

V.—CHEMISTRY.

43. As in the case of the Government Botanist, most of the time of the Agricultural Chemist was devoted to teaching. The examination for the diploma was held in March by Mr. Warth of Burma, with the Agricultural Chemist. The results were very satisfactory, all but three students obtaining the diploma.

Partly in consequence of the steps referred to above, taken to give publicity to the work of the Agricultural Chemist, there was a large increase in the number of samples sent for analysis. Mr. Harrison remarks that "a pleasing feature of this year's work is the fact that samples of soil and manures were received from cultivators residing in various parts of the Presidency, and there seems to be every probability of this branch of the work extending considerably in the near future". Reference has already been made to the work of the Agricultural Chemist on manures for

paddy. The study of the gases given off during the preliminary cultivation of paddy may show that waste is caused by the too early application of bulky manures to paddy. When the pot culture house is completed, I hope that the Agricultural Chemist may be able to investigate the subject of the effect of ploughing paddy fallows in the hot weather, a practice regarding which different opinions are held by cultivators in different parts of the country.

No suitable applicant has yet been found for the post of Chief Assistant for Research.

VI.—AGRICULTURAL EDUCATION.

44. Though the full number of students was admitted each term, the total number of students at the College at the end of the year was only 32 instead of 40. This is due to some of the selected students failing to join the College, and to some of those who have undergone a part of the course leaving without completing it, for various private reasons. Some natural alarm was caused by the prevalence of plague in the town. Provided that the course of instruction has not advanced too far, the places of those that leave are filled up by new recruits. Steps are being taken to minimize this. The students were examined on their practical work by the Deputy Directors in July, who made some useful suggestions for its improvement with a view to training the students' powers of observation, and the practical application of the information imparted at the College. Effect was given to these recommendations with the result that, when Mr. Sampson examined the students again in December, he reported that great improvement had been effected. All the students had a thorough knowledge of the farm work, and were keenly interested in the subject. The discipline and conduct of the students have been good. Taking over charge of the College, as he did, in the middle of the term, Mr. Wood has had a very hard task to perform in teaching, and managing the large farm and settlement. He has thrown the greatest enthusiasm and energy into the work and the College and Farm are now in a thoroughly satisfactory condition. No student can pass through the College now without acquiring a thorough practical knowledge of all the agricultural operations. Credit is also due to M.R.Ry. J. Chelvaranga Raju, the Principal's Chief Assistant, for the thoroughness with which he has supervised the field work of the students and to M.R.Ry. Ramaswamy Sivan, the Warden of the Hostels, for the manner in which he reassured the students during the plague scare, and kept them to their work, and helped and advised them in regard to their private affairs.

45. *Non-official visitors.*—M.R.Ry. Rao Bahadur Hanumantha Gowd Garn visited the College twice, and the Zamindar of Singampatti on one occasion. Both of them made a number of suggestions, which have been given effect to as far as possible.

46. *Publications.*—The number of publications received from and sent to other countries and other Provincial departments was as follows:—

						Indian.	Foreign.
Journals	...	...	...	...	...	21	74
Bulletins	...	...	...	...	...	36	257
Reports	...	...	...	...	...	293	59

M. E. COUCHMAN,
Director of Agriculture.

APPENDIX I.

THE ADMINISTRATION REPORTS OF THE AGRICULTURAL STATIONS DURING THE YEAR 1909-1910.

ADMINISTRATIVE REPORT OF THE AGRICULTURAL STATIONS, NORTHERN DIVISION.

The head-quarters of the Northern division continued to be at Bellary during the year. Mr. R. C. Wood continued as Deputy Director up to November 18th, 1909, with the exception of one month's privilege leave. During that period he spent 115 days in camp. On his transference to Coimbatore as Principal of the Agricultural College, charge of the division was taken over by M.R.Ry. D. Ananda Rao Garn, Assistant Director, who continued in charge until March 23rd, 1910, when he was relieved by the newly appointed Deputy Director Mr. G. R. Hilson. While in charge of the division the Assistant Director spent 111 days in camp. Of the remaining period up to the end of the year the Deputy Director spent six days in camp. All the Agricultural stations were visited during the year—Hagari four times, Nandyal four times, Bezwada six times, Samalkota seven times and Hindupur twice.

2. *Staff.*—The executive staff has been increased by one Assistant Director and the clerical staff by the posting of a Farm clerk to Bezwada. The Manager at Samalkota has been changed. The Manager and Assistant Manager at Hagari have continued throughout the year. The Manager at Nandyal was in charge for three months out of the year, the farm for the remainder of the time being in charge of the Assistant Manager of Bellary farm, which during that Manager's absence was put under the charge of Hagari Farm Manager. The Manager at Bezwada has been changed, the former Manager having been deputed to patti-mannu work in place of the Manager transferred from that work to Coimbatore. The Assistant Manager who joined the Forest Department has reverted to this Department and has been put in charge of the cotton work in Nandyal valley. No public building is yet available for the location of the head office; but it is expected that this state of affairs will be remedied shortly.

3. The late Deputy Director toured in the Kurnool District in June; in Gódvári and Kistna in August; in Vizagapatam in September and part of October; and in Ganjam in October. The tour in Vizagapatam was made for the purpose of inspecting the methods of agriculture practised under the varying conditions existing there. As a result of this tour it was shown that there exist great possibilities of increasing the scope of activity of the department. The lines that the work should follow are very similar to those already adopted in other districts, viz., economy in use of seed in planting paddy seed beds and single transplanting of paddy; introduction of the ground-nut crop and introduction of improved varieties of sugar-canes. The Kurnool tour was for the purpose of inspecting the new seed farms laid down in the Nandyal valley, which were found to be in a satisfactory condition. As a result of the demonstrations started last year and continued during this, with Massey's C.S. plough, seven more applications for this plough were received and complied with. This argues a more favourable attitude on the part of the ryot as regards this improvement and it is expected that at a not very distant date this plough will be in general use in that district.

4. The Assistant Director also toured in Kistna delta in connection with patti-mannu work and in Kurnool district in connection with the work of cotton improvement.

5. The work started last year for the purpose of discovering and distributing a cheap artificial substitute for patti-mannu was extended. Five experimental plots and eight demonstration plots were laid down. The results obtained though varying somewhat owing to irregularities of ground and rainfall and varying degrees of attention paid to the plots by their owners show that the work is being conducted on the right lines, and further extension of the work is being proceeded with.

6. District work in the vicinity of the farms is on the increase, the farms are becoming more widely known and the number of visitors is also on the increase. It must be noted, however, on this point that Nandyal and Samalkota are more favourably situated than the others, both as regards site and the class of ryot with whom they have to deal.

The main lines on which this district work is being carried out is as follows:—

Hagari and Bellary.

- (1) Advocacy of the use of farm cotton seed.
- (2) Advisability of single seedling, transplanting of paddy in wet land villages along the Hagari.
- (3) Improved methods of cultivation of garden crops.

Nandyal.

- (1) Advocacy of use of C.S. plough.
- (2) Improvement of paddy cultivation including use of green manure, economical transplanting and selection of seed.

Samalkota.

- (1) Improvement of jaggery making by greater cleanliness, straining juice, and more thorough skimming.
- (2) Planting canes in rows.
- (3) Improvement in paddy cultivation as at Nandyal.

That the work of the department is becoming more widely known may be seen from consideration of the number of agricultural calendars disposed of last year throughout the division, viz., 1,000 English and 3,500 Telugu.

The Bellary Agricultural Station.

7. The season was on the whole fairly favourable; the total rainfall was greater than last year but though it may be said that distribution was slightly better, the close of the season was as usual marked by a long period of drought.
 8. The yields from the crops were very moderate and in the case of korra the yield as compared with last year can only be said to be poor. Field No. 8 was again cropped with early jonna and produced a fair yield. Among the late crop varieties, kagi jonna again established its superiority over the others.
 9. The work of cotton selection is still in progress and attention has been drawn in the scientific report to the phenomenal increase in percentage of lint in the case of two varieties. The method to be adopted in this work in the future is also fully described.
 10. Cotton seed (1,040 lbs.) was distributed to those ryots who applied for it, but owing to the short-handedness of the staff during the sowing season no store was opened in the bazaar as was done formerly and some seed still remains from last year.
 11. The experimental plots were all maintained and have received full discussion in the scientific report.
 12. The number of visitors to the farm was 110. The farm cattle, with one exception, a bullock which fell lame and is now undergoing treatment in the Veterinary hospital, have all worked fairly well.
- The number of permanent coolies is three.

The Hagari Agricultural Station.

13. The investigations to determine the advisability of irrigating black cotton soil were abandoned towards the end of this year.
14. The manurial experiment and the seasonal paddy experiment were however both continued, but the results obtained do not show any variance from those obtained in former years.
15. The final results of last year's experiment dealing with the irrigation of cotton are given in the scientific report. The only additional point elicited was that irrigation on this land did not affect the percentage of lint. With regard to the thinning experiment, it is noteworthy that a fewer number of plants is required under irrigation to give a yield equal to that obtained from unirrigated plants; but it must be borne in mind that the yield per acre from the irrigated cotton is no greater than that obtained from a normal crop of unirrigated cotton and that there is all the extra expense of thinning and irrigating to be put against cultivation expenses. The dry land thinning experiment yields no more information than has been obtained from similar experiments conducted on the other farms.
16. A fresh experiment was devised at the instance of the Agricultural Chemist to test the effect of altering the magnesia-lime ratio in the soil. Though somewhat early to speak definitely, the results are distinctly favourable and further experimental work in this line will be carried out.
17. The results of the smut experiment show the usefulness of copper sulphate as a fungicide in dealing with the cholam crop but more work requires to be done to determine the proper strength of solution to be employed.
18. The improvement of cotton by selection is being proceeded with, and though at present the farm cotton is not notably superior to local, the results of last year's selection looked at in the light of expert opinion, are encouraging.
19. The investigation of garden crops was started this year. Several crops have been grown, spelt wheat, brinjals, maize, a very poor crop, radish, carrots, etc. The local patti-mannu is being experimented with, but as yet nothing definite can be said regarding its usefulness on this land.

20. The number of visitors to the farm is on the increase, local applications for seed and use of farm implements have been complied with, and friendly relations between the farm officers and neighbouring ryots are being established.

21. The Farm Manager M. Mangesha Rao continued in charge throughout the year and for a time was in charge of both Hagari and Bellary.

22. The number of bullocks has been reduced. They have all worked well.

The Nandyal Agricultural Station.

23. The season was unfavourable. The soil of the farm is termed in vernacular "Kullu regada"; in years of heavy rainfall such as last year's, crops do not thrive on the land but appear to rot, hence the name. The cotton crop suffered more than the others.

24. The work of cotton selection is still the main work of this farm and is proceeding favourably. The report received on last year's selection is given in the scientific report for this farm, where full discussion of the farm cottons will also be found. Expert opinion will be again obtained as to the value of the various selections.

25. The cultivation experiments conducted last year on this crop were continued; the results obtained, however, do not point to any definite conclusion, the cotton and horse-grain results seem to point in favour of the mixture but are not in favour of thinning and topping. The plots however are uneven. The spacing experiment has suffered the same fate as has befallen this experiment all along, viz., the plots were all too thin. The widest spaced (18") gave a slightly better yield than the unthinned while the 6" thinned and 12" thinned were respectively equal and poorer than the unthinned. Part of the area sown under cotton was sheep-folded and though no definite experiment was laid out, the results are in favour of this system of manuring. The indigo rotation plots are fully discussed in the scientific report. In the variety plots the results are somewhat different from last year's, Gadag having given a much better yield than Northern. In accordance with the ideas stated last year as to the extremely close relation existing between the two varieties Gadag and Northern, and after obtaining expert opinion regarding any differences to be found in the lint, it was decided that these two should be mixed and sown on the farm and distributed as Sarcapathi.

26. Five varieties of Hingari jonna were grown this year and good crops obtained. Oheruku-patcha still retains the premier position. The two new varieties have given the worst yields, Nilwa is better than Vanka.

27. As regards district work, the farm has been admirably chosen, standing as it does by the roadside it is easily seen; it has also the further advantage that it is passed daily by men interested in cotton on their way to the mills.

Interest in the farm is even now far greater than at either Bellary or Hagari and consequently its effect on the surrounding district is likely to become much greater in the near future. The visit of six Tahsildars of neighbouring taluks with some 200 ryots is worthy of mention. As a result, applications were received on the spot for supply of cotton seed to the extent of 384 maunds and later the Assistant Farm Manager received further applications.

28. This year an area of land, 45 acres in extent, was rented at Natla Kothur; about 20 acres of this land was waste land and infected with nut grass (*Cyperus rotundus*). This was ploughed up with the C.S. plough. The remainder received ordinary treatment. The results of deep ploughing are not marked in the same year as the operation is performed, and the yield from this part was not so heavy as from the rest of the field being 150 as compared with 263.

29. With the assistance of the Diwan of Banganapalle State, to whom thanks are due, four influential ryots in four different villages were found willing to grow farm seed under the instructions of the farm officers. They were supplied with seed and 75 acres were sown down. The yields were not exceptional save in one case, where a yield of 475 lbs. per acre was obtained.

30. Depots will be opened at Banganapalle and Koilkuntla and fresh ground broken by the establishment of two more seed farms. Later, the district north of Nandyal will have been brought into touch with the farm. Over 3,000 lbs. of seed were distributed.

31. Demonstrations of the C.S. plough were held and both the Assistant Farm Managers toured in the villages in connection with this work. Seven applications for this plough were complied with and more applications have been received.

32. Six ryots were induced to try the experiment of single transplanting of paddy seedling and the future extension of this work seems hopeful. In order to bring this system more prominently to the notice of the ryots, a plot situated in a prominent position in the town has been rented and comparative plots will be laid down.

33. The farm was in charge of Farm Manager Raghunatha Rao for three months and Assistant Farm Manager Narayan Aiyangar for the remainder of the year.

The Bezvada Agricultural Station.

34. No scientific report has been issued this year for this farm.

As the farm has only recently been handed over to the department, sufficient time has not elapsed for the acquisition of a thorough knowledge of the local methods of cultivation and of the climatic conditions governing these practices. Hence it has been difficult in the first place to devise experiments and secondly, owing to an unfavourable season, most of the experiments have failed.

The remarks made at the beginning of last year's report still hold good. The farm on the Ellore canal side is flanked by a village, the inhabitants of which, are in the habit of grazing their live-stock on the farm crops, this practice considerably affects the yields of the crops under investigation, and under such circumstances the accuracy of conclusions drawn from experiments which have undergone such treatment may well be doubted.

The season, as marked above, was unfavourable and was marked by short late rains, only 71 inch being recorded during the last three months of the calendar year, instead of the normal 8 inches expected. This told very heavily on the late sown (paddy) crops while even the mid season crops were much reduced in yield.

35. Crops.—The crops grown include most of the local crops, jonna (*Sorghum*), sazza (*Pennisetum typhoides*), cotton, Bengal gram (*Cicer arietinum*), and candi (*Cajanus indicus*). The most noteworthy result to be recorded was the splendid yield of the introduced varieties of sazza from South Africa, Transvaal and Lowveldt, which gave 1,656 and 1,640 lbs. per acre off plots $\frac{1}{2}$ acre as compared with 946 lbs. obtained from the local variety. This crop certainly seems to have a future in the district and, with the exception, perhaps, of Cambodia cotton, is the only promising line of work the farm offers.

Cambodia cotton has done well again this year. Expert opinion on Cambodia showed that the cotton is of excellent quality and of the type required. The yield last year was 210 lbs. per acre which ginned to 69 lbs. of kappas sold at Rs. 175 per candy, a return of Rs. 24 per acre. The percentage is high, viz., 33 per cent. as against 22.7 of local cotton.

This year nearly 500 lbs. per acre has been already gathered. The local cotton is superior in point of yield and has already given nearly 700 lbs. Picking is not yet over and discussion is deferred until ginning has been completed.

The experiment is interesting, and careful selection with the aim of producing a more compact plant should prove effective. The plant is handsome and the bolls are very attractive.

The grass is still very troublesome; in order to eradicate this pest the 'yegili' system (fallow ploughing through the growing season and taking a late crop of Bengal gram) was tried with favourable effect. Deep ploughing was continued in other plots with marked success: the land is naturally fertile and with the eradication of the grass will yield good crops. The Farm Manager reports that the farm crops grow better than the local crops.

Exotic maize, Hickory King and Brazilian flour corn, were a failure owing to the weedy nature of the land, and to the attacks of white-ants and jackals, the last named being especially troublesome. Seed has, however, been gathered, and, in view of the importance of this crop in parts of the Kistna delta, the experiment will be continued.

36. Smut experiments were also carried on, though not to such an extent as on the other farms. The copper sulphate treatment was perfectly successful and no smutted heads were seen, while untreated plots on both sides were affected.

The experiment to test the effect of sowing sorghum mixed with pulses was again unsuccessful; the pulses as in the previous year having all failed.

Thin as against thick sowing of sorghum was tried; the results show that thick sowing on these fertile lands, is, if the rainfall is insufficient, better than thin sowing, as thin fodder is produced while no reduction in the yield of grain is noted.

37. As a means of influencing the ryots this farm is behind all the others. In this respect its situation is most unfavourable; it is hidden for the most part between two embankments, and instead of being so placed as to be patent to all eyes, has to be looked for.

The number of visitors is very small, though the Tahsildars have all been circularised by the Collector.

38. Farm Manager L. Natesa Aiyar continued in charge, with the exception of two months' leave until December when he was deputed to patti-mannu work. Farm Manager S. Raghunatha Rao continued in charge from that date.

The Samalkota Agricultural Station.

39. The season was on the whole favourable; the heavy fall in April was of great assistance to the young canes, enabling them to get a good start.

The presence of 'Red rot' has unfortunately to be recorded on the farm itself in the close vicinity, and in the upland nursery. The attack is, however, slight and with proper care ought to be kept well within bounds; if not entirely eradicated.

In the nursery the plants did not thrive as well as expected. This was due in all probability to the land being poorer than the farm land. Part of this area has been given up and a fresh portion obtained and planted out with new seedling canes, two of which were but lately received from Barbados.

40. The results obtained this year from the cultural and manurial experiments are fairly conclusive. In the case of the cultural experiments, a comparison of the flat bed system of planting with shallow trenching shows that once the ryot has been persuaded to adopt planting in rows, the department has little else at present to teach him on that side of the question.

The results of the manurial experiment show that, while the application of lime has a favourable effect on the purity of juice, it affects adversely the yield of jaggery. With regard to the other manures, none have been found to give as good yields as castor-cake. A full discussion of these experiments will be found in the Scientific Report.

41. The demand this year for canes, i.e., B. 208 (as hardly any other variety was asked for) was far in excess of the supply, and many more canes could have been disposed of had they been available. One hundred and twenty-one applications, mostly from the surrounding district, were complied with, and 14,150 canes were distributed of which only 1,100 were other than B. 208. Numbers of applicants who would gladly have paid a higher price than the department was asking had to be turned away disappointed. An offer of Rs. 70 was received for the plot cultivated under the share system and holding some 1,700 canes, but had to be refused as the applicants were all inhabitants of one village.

42. The paddy experiments also gave good results. The manurial experiments, while showing that more work requires to be done on this important question, give some indication how and when this crop ought to be manured. The results of the cultural experiments indicate the great economy that may be gained and the benefits that may be derived from adopting the system of transplanting paddy seedlings singly and at fairly wide intervals.

The amount of seed required to plant an acre on the farm varies from six to eighteen pounds, which is in marked contrast to that noted by the Deputy Director while touring in the Vizagapatam district, viz., 140 lb. It is also worthy of note that by selecting seed from singly transplanted plants and sowing it again in the same manner a strain of seed is being evolved which will produce plants able to take full advantage of increased spacing.

The optimum distance at which seedlings ought to be transplanted has not yet been determined, but once the plants have become accustomed to the new conditions of cultivation this ought to be arrived at without much trouble.

43. Another failure has to be recorded against Bengal jute which is evidently unsuited to the district.

44. The experiments with turmeric show that local methods and local seed are preferable to Nandyal methods and seed.

45. Farm Manager Balakrishnamurthi continued in charge till the 13th of May when he received two months' privilege leave; on his return he was transferred to Central farm, Coimbatore, vice Farm Manager Rajagopalachari who had been transferred to this farm. The latter continued in charge till the 5th November when he left on sick leave. Assistant Farm Manager N. Sitaramaswami Nayudu continued throughout.

Assistant Farm Manager S. Subbiah in charge of seed selection work was transferred to Koilpatti and Assistant Farm Manager V. S. Narayanaswami Aiyar transferred from Palur to take his place.

Assistant Farm Manager A. Peterson was appointed as touring assistant to the Deputy Director of Agriculture on 1st August. He continued for two months when he was transferred to Samalkota where he continued till the end of the year.

The Hindupur Station.

46. As the cultivation of the aloe plant as a fibre crop is becoming of increasing importance, year by year, a summary of the work done in connection with this station may not be amiss.

47. In 1898, 3,000 plants of *Agave Sisalana* were distributed to the Collectors of Bellary, Anantapur, Salem, North Arcot, Cuddapah, Nellore, Coimbatore and Madura for cultivation. Most of these plants failed. It was then determined (1900) that an experiment under proper control and supervision should be started; accordingly in 1901-1902 a small area of land, situated about one mile from Hindupur railway station and bordering on the railway track, was taken up. This was planted as follows:—

Agave rigida var. Sisalana	...	...	...	...	6,225 plants.
" Americana	...	...	...	...	6,325 "
" Vivipara	...	...	...	...	15,920 "
Eureroea gigantea	...	...	...	...	504 "
					5

The plants of the first-named variety were obtained from Madras, Bangalore and Poona, those of the third-named from Dharwar; where the others were obtained is not stated. Of these plants, 4,800 died; the remainder established themselves. During the next three years little was done save to allow the plants to grow. It is reported that the year 1902-1903 was marked by heavy rainfall, which killed off 200 plants of *viopara* and caused the appearance of disease amongst the "sisal" plants. The disease took the form of withering of the tips of the leaves; this, however, disappeared and the plants thereafter did well. As a set off against the loss of plants by death the appearance of 500 suckers was reported. In 1904-1905 the plots were weeded and grasses removed to obviate loss from fire.

48. The following year, 1905-1906, the plot was examined with the idea of starting experiments to test—

- (1) Effect of clearing as compared with leaving to nature.
- (2) Drainage as compared with non-drainage.
- (3) Shade as compared with full exposure to the sun.

But as there was no shade and natural drainage was good and the plot had just been cleared, these ideas had to be abandoned and all that could be done was to portion off part to be left to its own resources for comparison with the part kept cleared. The yield of fibre was tested and it was found that 362 plants yielded 4,579 leaves containing 3 per cent. of fibre. The cost of production was, however, very heavy, being as much as £28 per ton. In 1906-1907 it was noted for the first time that some plants had poled.

49. Next year, 1907-1908, fibre from the three varieties *Sisalana*, *Americana* and *Furcraea gigantea* was sent to the Imperial Institute for valuation. Reference to that report shows that the fibres obtained compare favourably with foreign fibre. *Sisalana* was the best and produces 3 per cent. of fibre. *Americana* was next, the percentage of fibre in this plant varies from 1.4 per cent. *Furcraea* was least valuable and the percentage is small, being as low as .34 per cent. Two cuttings were made—one in May and one in October. The yields were as follows:—

	Leaves.	Fibre. lb.
May	16,517	495
October	3,532	105

50. Last year the work was extended. A fresh plot was laid out on the southern side of and at a distance of half-a-mile from the railway. This was planted up with '*Sisalana*' and three experiments were devised to compare—

- (1) Trimming old roots and lower leaves before planting with planting untrimmed.
- (2) Flat bed planting with ridges.
- (3) Big plants with little.

As pointed out in last year's report the results of these experiments were in favour of (1) planting untrimmed, but it was doubted whether the plants had not been too severely trimmed, (2) planting out in ridges, (3) planting big plants up to a certain point.

51. Besides this, another small area, 2 acres, at Somandapalle was planted out with 2,000 suckers of '*Sisalana*'. The intention as regards this area is to leave the plants to grow in a natural manner in order to test just how little attention this plant can do with. The yields obtained last year were at the rate of 430 lb. The number of poled plants up to 1908-1909 was 80. At the present date the arrangement of this experiment is as follows:—

- (a) The old plantation divided up into eleven plots—

- Plot 1. Unoccupied.
- " 2. Nursery planted with suckers and bulbils of *Sisalana*.
- " 3. Planted out in nine rows with *Sisalana* from North Arcot.
- " 4. Do. do. Madras.
- " 5. Do. 11 rows with *Furcraea*, small portions of the plot utilised as nursery.
- " 6. 40 rows of 'sisal'. Outside seven, non-experimental, the next nine experimental, remainder non-experimental.
- " 7. Four rows of 'sisal' from Vellore Jail.
- " 8. Sisal from Madras and Bangalore planted in 1901-1902. Forty-eight rows.
- " 9. Do. Poona planted in 1901-1902. Sixteen rows.
- " 10. *Americana* planted in 1901-1902.
- " 11. *Viopara* planted in 1901-1902. This was abandoned but now shows signs of reviving.

Two cuttings were taken from the nine experimental rows in plot 5 this year—one in September and one in January. The yields of leaf per row are given below, also the weight of fibre calculated assuming that 100 lb. of leaf gave $3\frac{1}{2}$ lb. of fibre. No fibre was actually extracted.

	Fibre per acre. lb.	September.	January.
1	319	212	160
2	203	148	96
3	188	124	101
4	305	224	141
5	199	154	81
6	200	159	80
7	203	110	133
8	272	216	109
9	282	195	142

(b) New plantation, south of the railway, already described. The untrimmed plants continue to do better than the trimmed, the big plants better than the little, and those planted in ridges better than those planted in flat beds. Seventy-six of the plants have died.

(c) Area at Somandapalle already described.

52. Some fungus disease appeared in the old plantation in plots 3, 4 and 6; but the attack was not serious, and the affected leaves were cut and burnt. The plants in all the plots seem to be nearing the poling stage. The number noted this year in plot 3 is twenty-five; in plot 6, sixty-nine, in plot 7, seven; and in plot 9, two. No plants poled this year in plot 5, and in plot 10, *Agave Americana*, none have poled since this plot was planted.

53. The expenditure this year has simply been the pay of the watchman, with the cost of a cooly in September to aid in cutting the leaves.

BELLARY,
21st May 1910.

G. R. HILSON,
Deputy Director of Agriculture, Northern Division.

ADMINISTRATIVE REPORT OF THE AGRICULTURAL STATIONS, SOUTHERN DIVISION.

In submitting the administration report of the Agricultural stations which have been under my charge throughout the year under review, I have the honour to draw your attention to the following District work which has been done in the Southern Division.

2. Farm Manager, C. Narayana Aiyar, has been on special duty in the Tanjore delta throughout the period, except for 48 days when he was temporarily transferred to the Northern Division. He has now completed his tours of agricultural enquiry in the Mannargudi and Nannilam taluks. In addition to this, he has done much work in bringing improvements recommended by the department to the notice of the ryot, notably single seedling planting of paddy and the cultivation of green manure crops on the wet lands. Regarding the latter improvement he has sold about 39 bags of indigo seed which is sufficient to sow about 957 acres, 20 bags of koringi sufficient to sow about 250 acres and 13½ bags of sunnhemp seed sufficient to sow about 88 acres and he has distributed seed of new varieties of maize to several selected cultivators in the Mannargudi taluk. There is now a possibility of largely extending the practice of green manuring and there is no doubt that in time the supply of seeds will be taken up by merchants locally.

3. Demonstrations have been held showing the value of the Archimedian screw for lifting water at low lifts, and the sale of improved ploughs for Messrs. Massey & Co. has been taken up with a view to showing this firm that there is a sufficiently large demand for these, to warrant their starting their own agencies in the delta. Recently this Manager has been so fully employed in giving advice and assistance to those who are trying improvements that the original object of his enquiry has rather been lost sight of.

4. In Tinnevely the work of cotton improvement has assumed much larger dimensions. The registers from the 37 seed depots show that over 140,000 lb. of seed was sold and an area of 15,600 acres was sown with seed supplied by the department and that 1,550 acres of land belonging to ryots situated in 49 different villages came under drill cultivation this year. In addition to this 550 acres of ryots' land situated in 16 villages was sown by the department for seed under the conditions already communicated. This work was directly under the Manager, Koilpatti Agricultural station, and two full-time Assistant Managers were on special duty under him, while one Assistant Manager was employed both on the Agricultural station and on this work at the same time.

5. In North Arcot, seed of introduced varieties of maize has been distributed to selected cultivators by whom this crop is grown.

6. Both in South Canara and Malabar, sugar-cane has been distributed to selected cultivators and assistance given at the time of planting, while ryots who grew the cane last year have been shown and taught the process of the manufacture of jaggery.

7. In conclusion I wish to draw attention to the way in which all my subordinates have worked. Some have had more arduous duties to perform than others, and it might seem that such deserve special mention, but I consider that each in his own sphere has shown an increasing interest and enthusiasm in his work which has considerably raised the standard of efficiency in the department.

I would also draw attention to the large increase in correspondence with the general public which has taken place within the last two years, as well as to the increase in departmental work, in my office, details of which have already been communicated to you. The figures show that with an establishment of only three clerks, it would have been impossible to cope with this work within office hours only.

The Palur Agricultural Station.

The season.—The summer rains and the south-west monsoon were exceptionally good this year. The former greatly benefited the green manure crops sown on the wet land, though unfortunately very heavy rain occurred just after the sugar-cane crops had been planted which destroyed many of the sets. The abundant south-west monsoon rainfall gave an exceptionally high yield of dry land cereals, though the quality was slightly damaged owing to continuous rains at harvest time. The sugar-cane further suffered from this continuous wet weather, which gave no opportunity for earthing up the plants or effecting proper drainage. The north-east monsoon completely failed; thus the rainfed groundnut crop was poor and so were the samba paddy crops. The sugar-cane benefited, however, as this gave an opportunity to drain the land.

2. *The experimental work.*—on this station has been continued on the same lines as last year. The cereal groundnut experiments seem likely to give very valuable results and have been fully discussed in the Scientific report. This year it has been possible to demonstrate some of the improvements which have been proved by experiments—notably the introduction of green manure crops and the single planting of paddy. The introduction of Mauritius sugar-cane has got beyond the bounds of demonstration as the following figures of the area under canes in the neighbourhood will show:—

	ACS.
Total area under cane	467
Area under Mauritius canes	353
Area under local canes	114
Percentage area of Mauritius canes	75.6 per cent.

Of the area under Mauritius canes 162 acres were planted by the East India Distilleries and Sugar Factory, Nellikuppam.

3. *Demonstration of improvements.*—The value of Daincha (*Sesbania aculeata*) as a green manure was demonstrated. One acre of the worst wet land on the Agricultural station was selected. The paddy crop, which followed, yielded this year 2,240 lb. whereas the same field without a green manure crop yielded only 1,292 lb. in the previous year. This and other plots where green manure crops have been tried have created considerable interest among visitors to the Agricultural station and a fairly large area, estimated at about 150 acres, in the neighbourhood has been sown with green manure and pulse crops as a result. Single seedling method of planting and a large extension of this improvement may be expected next year. Apart from direct improvements in cultivation, large quantities of seed for sowing have been supplied from this Agricultural station. During the year over 31,000 lb. of groundnut seed, 8,000 lb. of paddy and 500 lb. of other miscellaneous seeds were supplied to applicants. In addition to the issue of seed, 3 Egyptian ploughs, (introduced by the Deputy Director of Agriculture, Sind, from Egypt and slightly modified in size to suit local requirements), 9 improved country ploughs and 22 harrows have been sold to applicants, while orders are on hand for 14 Egyptian ploughs, 17 improved country ploughs and 2 harrows. These are made by arrangement with the village carpenter and blacksmith who supply them through the Manager at definite rates. Thus every implement has to come up to standard before it is issued. The arrangement is not altogether satisfactory, since the work is often delayed as the village artisans have to give preference to village requirements. If the demand shows a likelihood of increasing it may prove more satisfactory to employ a whole time artisan to attend to this and similar work for the Agricultural station.

4. *Crops newly introduced.*—In addition to green manure crops referred to above, the following other crops are under trial and promise to be useful introductions.

Maize varieties.—Two American varieties introduced from South Africa promise to prove useful introductions. Seed of these has been distributed to selected cultivators in those parts of Tanjore and North Arcot districts where the crop is now grown.

Several varieties of paddy are under trial.—One or two short duration paddies from the Central Provinces may prove useful as first crop varieties, in places where the season or water-supply is liable to fail before the second crop is harvested. One or two second crop or samba varieties introduced from other districts seem very promising.

Cambodia Cotton, which has extended so rapidly in Tinnevely, promises to fill a great want in this district, i.e., a remunerative crop which will rotate with irrigated groundnut. It is estimated that the crop now under trial on the Agricultural station will bring in a profit of Rs. 150 per acre. This has been grown on good garden land under a well. Already some applications have been received from ryots who wish to try this in place of the irrigated groundnut crop.

5. *The Staff.*—The strength of the staff has remained the same throughout the year. One Assistant Manager was transferred to the Northern Division and his place was taken by another Assistant Manager who had been temporarily transferred to Koilpatti Agricultural Station from the West Coast, to assist during the season in the work under cotton improvement.

6. *Miscellaneous.*—An extension to the seed store has been found necessary and this is now nearing completion. One of the farm bullocks was stolen and flayed for its skin. The culprits, however, were discovered by the police and the case was dealt with in the Panruti Sub-Magistrate's Court.

The Koilpatti Agricultural Station.

Seasons.—Though the seasons have not been particularly favourable for the cotton crop, it has on the whole been very favourable to other black cotton soil crops. The hot weather rains (April and May) amounted to 6.24 inches, but these were all light showers with the exception of a heavy rain of 3.70 inches which fell in April. With the help of this rain many black soil ryots sowed red gram, which crop was further assisted by the unusual rainfall of 3.75 inches which fell in August. The same hot weather rains accompanied by cold nights and misty mornings were however, very unfavourable to the second flush of cotton, causing flowers and young bolls to drop off. The result was that the summer picking, which the previous year continued well into July, was practically completed by the end of May.

The heavy rainfall of August was utilised for the sowing of most of the red soil crops, and thus the farm work was well advanced before the black cotton soil sowing commenced. The north-east monsoon practically failed in the tract. No general rainfall occurred, and though in most places the average amount of rain fell in the shape of thunderstorms which were sufficient for sowing, in some localities even these did not fall. From the beginning of December till the end of the year practically no rain fell; the nights were cold and the mornings dewy. These conditions were particularly favourable to both the cumbu and the pulse crops. The cumbu grain set well and the pulses are said to be the best crop for many years. This was particularly fortunate since in the previous year the crop was a complete failure. Though these weather conditions favoured these crops, they were not at all favourable to the cotton. A light shower in February which during January and February require the moist sea breeze. A light shower in February followed by misty mornings caused flowers and bolls to drop and lessened the estimated yield of cotton by about 40 per cent. In the case of early sown crops the loss was more. In one of the seed farms near Koilpatti the yield was estimated at the end of January to be about 600 lb. of seed kappas per acre, but after this change in the weather the yield can only be estimated at 200 lb. The yield from 550 acres of seed farm was, at the end of January, estimated at 840 pothies, but now can only be estimated at under 500.

On the whole, the year has been distinctly favourable to cultivators in this tract. Most ryots have been able to sell cotton at Rs. 30 and over per pothi as against Rs. 19 at this time last year, which makes up to a great extent the deficiency in the yield. Their grain crops have been good while the pulses have been excellent.

2. *Crops.*—The general farm cropping has been continued, namely, a four-course rotation of cotton every other year, and cumbu and fodder cholam alternately in the intervening years. The area under Karunganni has been extended slightly in view of meeting the demand of seed for sowing in our seed farms. The seed sown was from kappas collected from selected plants which gave a percentage of lint to seed of 29.63 per cent. against 25 per cent. which is usually taken as the average of the district. Uppam cotton was grown on about 12 acres. This also shows much improvement. The lint seems longer and not quite so harsh as formerly, while the percentage of lint from the kappas selected for farm sowing was 30.46 per cent. Cotton for detailed selection was sown on an area of nearly 12 acres and a further field plant-war selection has been made of these, with the idea of obtaining further improvement in the future. These crops show this year that natural cross fertilization is much more frequent than is generally supposed, and many of the most promising selections of last year have shown themselves to be crosses and have therefore to be discarded. All the select Uppams have had to be discarded as a large proportion of each selection shows undoubted signs of the grandparent having been crossed with Karunganni. However some of the selections are now in the third generation since the original parent was selected and show no signs of cross fertilization. Those, which are worth going on with, are all better than the original parents. One has given a percentage

of lint for the last two years of over 34 per cent. while the lint of two others are pronounced to be worth 1d. per pound more than "F.G.F. Tinnevelles". It will be possible to sow several acres next year with some of them.

Nineteen acres of cumbu were sown this year, the whole area being sown with the drill. The crops were much better than usual and amply demonstrated to interested visitors that drill cultivation is as applicable to cereals as it is to cotton. When this fact is more fully known it will do much to assist in the work of extending the practice of drill cultivation. A similar area was under fodder cholam and similar experiments were tried with this as were tried last year.

The manurial, rotation and spacing experiments were continued. On the red soil similar demonstrations to those of last year were conducted with ragi and onions, details of which will be found in the scientific report of this station.

3. *Insect attacks.*—A severe attack of grasshopper was common throughout the south of the district and much damage was caused to young cumbu and cholam crops. Outside, cases were reported where severe damage was done to ragi and samai crops even when in ear. Large areas in the district originally sown with cereals had on this account to be ploughed up and sown with cotton. The farm crops however escaped fairly lightly. All the cholam crops were attacked but not sufficiently badly to necessitate resowing. The attack however was sufficiently serious to nullify any experiments being conducted. About 2 acres of cumbu, which was resown and again eaten off, had to be sown with Bengal gram, but otherwise little damage was noticed when the surviving crop had grown up. Bagging was tried on the farm and demonstrated in several villages. A general knowledge of this method of dealing with the pest would do much to lessen the attack another year.

Aphis also made its appearance on the Karunganni cotton, which, having a smoother leaf, is more liable to this attack than Uppam.

4. *Miscellaneous.*—A seed-store is being erected by the Public Works Department and is nearing completion. One pair of bullocks was sold and replaced by a younger pair.

The Taliparamba Agricultural Station.

The season and cropping.—This has been very favourable on the whole. The pepper flushed early, owing to the heavy cyclone in May, and the monsoon was broken with two or three periods of fine weather. September-October rains were exceptionally good, while, as usual, the latter part of the year has been hot and dry.

Sugarcane.—was established before the monsoon, chiefly in February-March, with the aid of hand watering. A few canes of B. 208 from Samalkot were planted late, as well as other canes to fill up the vacant ground of this plot. As last year's canes were allowed to remain on the ground to supply demands for seed and for filling vacancies, these were also ratooned late. All the dry land crops and paddy nurseries were sown with the aid of the cyclonic rain of May and were thus well established before the monsoon broke. Transplanting of paddy and ragi was completed in June and pepper cuttings and standards were planted in their proper season.

2. *Crop results—Pepper.*—This has been an exceptionally good year on the farm. The season favoured the setting of pepper so that all vines, good and bad, yielded. The yield is the highest yet recorded, viz., 4,893 lbs. of pepper. This included a small quantity harvested from vines planted since the farm was started.

Paddy.—gave an average acre yield of 941 Madras measures. The spacing methods were again demonstrated, but owing to the large proportion of chaff the yields are not comparable. One plot for example yielded 1,869 Madras measures at threshing, but contained so much chaff that the cleaned dry grain only measured 1,080 Madras measures. Even this however, is good for this class of land. Analysis of the soil seems to show that these West Coast soils cannot maintain the requirements of phosphorus and potash when green manure only is applied and this year potash is being supplied in addition to the green dressing.

Ground-nuts.—These grown on newly cleared modan land (land under fugitive cultivation) gave good crops with manuring, either with ashes, or cattle manure, or both. Without manure however the yields were poor. The yields of the several plots will be found in the scientific report. It is surprising, however, how readily this poor soil responds to even light manuring. Probably in an ordinary jungle clearing, where the scrub is burnt *in situ*, the ash thus supplied would give an excellent crop. As the line of work adopted on the agricultural station is for the permanent cultivation of this land, the scrub was rooted out and removed and hence this has not been tested.

Ginger.—following groundnuts, on similar land to the above, promises to be a most paying crop. A plot, 4-80 cents in area, yielded 800 lb. of green ginger, valued at the local price at about Rs. 34. This works out roughly to Rs. 800 per acre, the cultivation expenses were Rs. 115 per acre. The method of cultivation was that of South Malabar. This has attracted

some attention locally and it is stated that three or four persons, who saw the crop, have, on their own initiative, imported rhizomes from South Malabar for planting this next year. The main difference between the local and the South Malabar method is that, in the latter, they plant with the showers before the monsoon while in the North Malabar and South Canara they plant only on the burst of the monsoon. This late planting may also account for the prevalence of the disease in the South Canara crop since good drainage is an absolute essential to the crop. I have been informed that the disease is, on occasions, so severe that the cultivation has become greatly restricted.

Ragi.—following ground-nuts and manured with six handy-loads of cattle manure and two of ashes gave an average acre yield of 1,240 lb. Considering that only 16 cents were grown with this and that it was subject to the attack of handicoats, rats, etc. the yield is encouraging.

Modan paddy.—on a similarly small scale almost failed on account of these pests. As the area now available for trial of these cereals after groundnuts is much larger, it is hoped that it will be possible to protect these crops better, Cassava, onions and maize were also tried but with little success. The soil proved too loose for onions, maize flowered before the rains were well over and thus failed to set its grain properly, while the cassava did not grow well and what did grow fell a prey to porcupine.

Guinea grass.—seems at last to have found suitable conditions, under which it will thrive and pay for its cultivation. This does exceedingly well on this modan land provided that it is manured annually. When seen in February, it was still growing vigorously and was greedily grazed by cattle. Of the other indigenous grasses, those mentioned in previous reports can still be recommended in that they continue to grow or at any rate remain green throughout the year.

Sugarcane.—The Mauritius varieties introduced in 1907 give excellent crops. It was calculated this year that the yield from "plant" canes was as much as 26 candies of jaggery per acre, while that of "ratoon" canes was almost as high being 23 candies. The B. 208 introduced this year from Samalkot gives promise of being admirably adapted to the West Coast. So far it has retained its habit of being a thick, short, sturdy cane and it ripens better than the Mauritius varieties. Large quantities of Mauritius cane sets have been distributed in the sugarcane tracts of South Canara and also in Malabar, especially in the neighbourhood of the farm, where many ryots have substituted this for a portion of their plantain gardens. Photographs of canes grown at this agricultural station will be seen in the Scientific Report.

Green manure crops.—Trials with field cow-gram and ground-nuts as green manure crops are most promising. Space is not available however to test accurately the increase in yield and though the plot yields show that the outturn has been doubled, the results may not be quite as high as this when grown on plots of the same known fertility.

3. *Staff and touring.*—The sanctioned staff of a Manager and two Assistant Managers were stationed here till the heaviest work of the year was over, when one of the Assistant Managers was transferred to Tinnevely where there was heavy work under cotton improvement. The manager toured chiefly in the Ponnani and Chirakkal taluks of Malabar as well as in the Coondapoor division of South Canara. He spent 110 days on tour in Malabar and 65 in South Canara and also visited the Central Agricultural Station at Coimbatore. There is no doubt that his constant touring is doing much to awaken and maintain the interest taken in agricultural improvement.

The Assistant Manager has toured mainly within the neighbourhood of the farm.

The staff of the station have all worked satisfactorily and it is hoped that in the near future some of the heavy touring of the manager will be taken off his hands.

4. *Miscellaneous.*—Special interest has been taken by visitors in the sugarcane, ground-nut and ginger crops. Green manuring has attracted some local attention, but to see the benefit of this, both the green manure crop and the subsequent paddy crop must be seen. In spite of the inaccessibility of this agricultural station, the number of visitors who take an interest in the practical side of the work is constantly increasing. These represent all parts of the two West Coast districts. The acting Imperial Mycologist visited the agricultural station after inspecting the pepper crops of the Wynaad, but his final report as to whether the Wynaad pepper disease is the same as the disease on the agricultural station, has not yet come to hand. New quarters are being erected for an Assistant Manager, which, it is expected, will be completed before the monsoon breaks.

TRICHINOPOLY,
6th May 1910.

H. C. SAMPSON,
Deputy Director of Agriculture, Southern Division.

APPENDIX II.

REPORT ON THE COLLEGE OF AGRICULTURE AND RESEARCH
INSTITUTE AND THE CENTRAL FARM, COIMBATORE, FOR
THE YEAR 1909-1910.

The College was formally opened on the 14th July by His Excellency Sir Arthur Lawley, who was accompanied by Lady Lawley. It will be remembered that His Excellency Sir Arthur Lawley, who has taken the greatest interest in the work of the Department, laid the foundation stone on the 24th September 1906. The whole of the constructional work has been finished, and all the rooms occupied by the experts to whom they have been allotted. A certain amount of rearrangement of the original distribution has been found necessary; the Museum, for instance, is to be located on the east of the main entrance, instead of upstairs in the rear block, where the Entomological section now finds quarters. The arrival of the Mycologist in January has completed the staff at present sanctioned, and he has taken possession of his rooms though they are at present unfurnished. The Botanist and the Mycologist occupy the whole of the front block upstairs, the upper story of the rear block containing the Biological teaching rooms, with lecture and assistants' rooms. Downstairs the Agricultural Chemist occupies the whole of the rear block, while the front block is shared by the Principal, the Physics section and various preparation rooms. Besides the Mycologist's rooms—the Library, the Principal's room and some of the Government Botanist's rooms still remain to be furnished. The appearance of the College will be greatly improved by the handsome compound wall now being built by the Public Works Department.

The lighting scheme is at present under consideration by Government. The water-supply is still dependent on two hand pumps, but it is hoped that the permanent installation which has received the sanction of Government will shortly be erected. The same installation will also supply the native officers' quarters and the students' hostels, to many of which water has now to be supplied by cart at considerable inconvenience. All types of quarters were practically fully occupied during the year, and further additions to the staff will necessitate the construction of additional quarters. The general appearance of the quarters and the College maidan has been improved and as soon as the drainage works now being constructed by the Department of the Public Works are finished, the work of clearing and tidying round the sites can be properly taken up. The main water-supply being reserved wholly for drinking and washing, water for tree-planting will be partially supplied by a masonry channel running from the farm well past the rest-house and the line of quarters on the west of the maidan.

The Post office has been finished and is now occupied by the Postmaster, thus setting free two quarters and the workshop for use by the farm.

Plans for a rest-house for Indian visitors have been scrutinised and a site suggested. It will face the maidan, and accommodate three visitors at a time.

Visitors.—Besides the ordinary Coimbatore sightseer, who regards the College as a pleasant object for an afternoon's walk for himself and his family, the College has been visited by the Commissioner twice; the Director of Agriculture on five occasions; Mr. S. D. Bowden of the Industrial Exhibition Station, Ongole; M.R.Ry. H. V. Nanjundayya, Member of His Highness the Maharaja's Council, Mysore; the Raja of Kollengode; the Poligar of Uttukuli; the Zamindars of Singampatti and Chennappanayakampalayam; M.R.Ry. Rao Bahadur Hanumantha Gowd (the last five all Honorary Visitors); the Court of Wards, who stopped two days; and many others more or less interested in Agricultural or other Scientific training.

Students.—There are at present under instruction in the College, eighteen students who have completed two years of their course, and thirteen who completed one year. The deficiency in numbers is regrettable, but is due to students leaving during the course or being found unsuitable. It is not possible to make up the numbers either by drafting in students during the course or by admitting more students in the following year, as there is accommodation in the laboratories for only twenty.

Applications for admission continue to increase, 144 having been received during the present year. Many of them were however from failed Matriculates, who with remarkable unanimity discovered that Agriculture was the subject they had been wanting to take up for years.

District.	Number.	Caste.
Coorg	1	Coorg.
Tanjore	1	Vakkiliya.
	1	Brahmin.
	1	Baliya.

District.	Number.	Caste.
Trichinopoly	1	Mahomedan.
Madura	1	Brahmin.
Salem	1	Brahmin.
Malabar	1	Nair.
South Canara	1	Samandha.
Cochin	1	Christian.
Mysore	1	Brahmin.
Godavari	1	Vaisya.
Ganjám	1	Brahmin.
	1	Do.
	1	Uriya Brahmin.
	1	Brahmin.
Kistna	1	Kammavara.
	1	Kehatriya.
Vizagapatam	1	Brahmin.

Terms.—Last year's work commenced in May instead of in June, owing to the early closure of the college on account of plague, and there was a continuous term from then until December 17th with a single week's vacation in September. This was felt to be too long, and though it was exceptional, it has been proposed to open earlier and have one month's vacation in September. Among other advantages, this will, as pointed out by Deputy Director of Agriculture, Southern division, enable the students to see something of their own crops at home, which in view of the ignorance most of them have when they arrive, is most desirable. Government orders on this proposal are awaited.

Work—Agriculture.—The second year have attended a course of lectures on agriculture delivered by the Principal and have put in three 3-hour practical classes a week, two in the morning and one in the afternoon. During this time they have completely cultivated their own 1 acre plots of cotton, cholam and Bengal gram, with the exception of the operations necessary while they were away. They have also fully joined in the work of the farm, and have performed every farm operation. There are naturally great differences in the quality of the work they do, but though there has been grumbling at the arduous nature of the tasks they are set, yet the class as a whole realise the importance of this field work. There is certainly no prospect of the present staff countenancing any reduction in it. The first year are superior to the second year in their field work but inferior in their class and laboratory work. They are in fact better material to start with, but will not benefit so much by the instruction given them during their stay here. Both years they were examined *viva voce* in agriculture by the Deputy Directors in July last, and again in December the Deputy Director of Agriculture, Southern division, examined those students whom he had not examined before. Certain recommendations as to the methods of teaching, and the directions in which the students were deficient were discussed by the Director and the whole of the staff, and certain important suggestions for the training of the students were made, which are being given effect to, so far as circumstances permit.

Botany.—There were two classes in Botany during the year—

(1) *Elementary Botany.*—Thirty-five lectures were delivered and 65 practical classes were held. The subject was treated in an elementary manner, special stress being laid on such parts as would enable the students to understand the living processes going on in plants and to prepare them for the succeeding course in Agricultural Botany. Some importance was attached in the course to plant physiology, and simple experiments were done in class, but in the absence of the full equipment of the laboratory the more elaborate ones were unavoidably omitted.

(2) *Agricultural Botany.*—Sixty-eight lectures were given and 102 practical classes held. The general principles underlying the life and character of cultivated plants were dealt with. Some attention was paid to the processes of horticulture and arboriculture and the more important crops of the Presidency were examined in some detail.

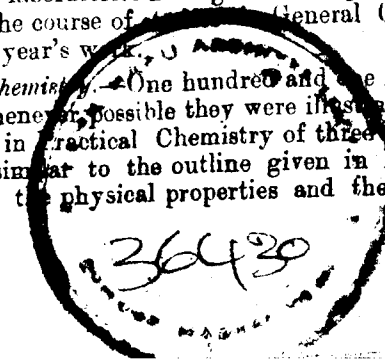
Entomology.—There were two classes in Entomology during the year—

(1) *First year.*—Twenty-five classes were held in which more than half the time was spent in the field. The students were taught to observe and collect insects in the field. Lectures were given on the characters and metamorphosis of insects and their classification into orders.

(2) *Second year.*—Thirty-one classes were held. The teaching was of a more practical character, special crop pests were studied and the chief remedial measures demonstrated.

Chemistry.—The new laboratories having been occupied early in the year 1909, the students were able to go through the course of General Chemistry without the disadvantages attendant on the previous year's work.

General Theoretical Chemistry.—One hundred and one lectures were given in General Theoretical Chemistry and whenever possible they were illustrated by means of experiments. One hundred and four classes in Practical Chemistry of three hours' duration each were held, the course of studies being similar to the outline given in last year's report. The number of experiments dealing with the physical properties and the mechanical composition of soil were



however increased in number so as to cover a wider field. The lectures in Agricultural Chemistry were 68 in number and dealt with such subjects as plant and animal life, manures and manuring, the formation and chemical and physical properties of soil, crops, the feeding of animals, and dairy chemistry.

Examinations.—The examination for the Diploma in Chemistry, Botany and Entomology was held at the close of the last term, at the end of the second year of the course. It was decided that this arrangement would be better than to hold the complete examination in all subjects at the end of the three full years, as the students could then devote their whole attention to the advanced agricultural work of their last year. The deputation of Mr. Leake, the Economic Botanist of the United Provinces and Mr. Warth, the Agricultural Chemist in Burma, permitted the formation of a Board of Examiners in Agricultural Botany and Agricultural Chemistry respectively. The examination in Entomology was held by the First Assistant. In considering the work of each student, not only his position in the Diploma Examination, but also his work during the previous years as shown by his note books and attendance was considered. As a result four students were held to have failed. Two of these will not be permitted to return: the other two will be allowed to sit again next year in the subject in which they have failed and, if successful, will be eligible for the Diploma.

Students' Club.—The Students' Athletic Club which was affiliated to the Officers' Club, for purposes of games, has during the year developed into a General Students' Club and has absorbed the Students' Association while at the same time severing all connexion with the Officers' Club. It is thus completely independent and has taken control of the Reading Room in the College. Membership is compulsory, and the subscription is Rs. 2 each term which will cover all the expenditure in the Athletic and Literary branches, though the purchase of all the outfit necessary for hockey, foot-ball, cricket, tennis and badminton necessary at the starting of the Club has been a severe drain on the Club funds. Several members of the Department and Honorary Visitors have kindly subscribed, and the thanks of the Club are due to them. Friendly cricket matches were played against Coimbatore, and the visit of the Court of Wards referred to above was taken advantage of, for tennis and cricket matches. The first year students are extremely keen on all games and it is considered desirable to encourage fully this side of College life, since the post of Gymnastic Instructor has been abolished.

The Honorary post of Warden has been held by M.R.Ry. Ramaswami Sivan, First Assistant to the Agricultural Chemist, during the year and he has spent much of his spare time in attending to the comfort of the students. At his suggestion, proposals are now under consideration to form messes for the different classes of students, since the servant difficulty has caused a good deal of trouble to some of the less wealthy students. The responsibilities as well as the actual work of the Warden will increase next year, and a proposal to allow him free quarters as some recognition of this, is now under consideration.

A Co-operative Society for the sale of stores, grain and other produce was opened in September 1909, in quarters lent by the Principal, and immediately secured the support of the whole of the settlement. Formerly it had been impossible to procure anything nearer than Coimbatore, and even the students had to go in to the town for everything they needed. The store was thus fulfilling a most useful purpose, but it has unfortunately been ruled that no Government servant drawing more than Rs. 35 may become a member of a Co-operative Society of this nature. The matter, it is understood, is still pending the final orders of Government.

The Farm.—The season has been extremely favourable, and with the exception of the wheat crop, bumper harvests have been generally obtained. The system of farming adopted was adapted to the needs of the students as far as possible while experiments, cultural, manurial, and varietal were carefully conducted on the most important crops.

The green manuring of paddy, and the effect of reducing the seed rate both in the seed-bed and at the time of transplanting have been carefully noted and will lead, it is hoped, to economies in the cultivation of this crop. There is an indication, which needs verification, of the value of fish manure as a manure for paddy, which if true will open up great possibilities. Even artificial manure such as sodium nitrate, it seems possible to use with profit, though it is too early to speak definitely. A certain amount of information has accumulated with regard to the transplantation of other crops than paddy, which may have an effect on the methods of cultivation. The irrigation of crops in the ridge and furrow system again showed not only economy of water, but an increase in the yield, and this system will be more widely introduced on the farm. The drill system of sowing cotton has not yet met with the success attained in Tinnevely, as the yields have been less each year than when drilled in the ordinary way. The cultivation of ground-nut was not attended with success. The attempt to grow sugar-cane on dry land was discontinued; the wet land cane was only moderate; it included the trial of several new varieties sent from Samalkota, as well as manurial and planting experiments. The problem to be faced here, is to get a full stand of canes from a smaller number of sets than is used at present. The R.I.S. clean, its use is to be recommended. It has been lent to a neighbouring farmer during the year. Many of the other implements though indispensable for experimental work are not such as can be recommended for purchase by the ryot. The winnowing machine is a possible exception to this, and if it could be made cheaply should command a ready sale. The number of cattle continues to

increase by births on the farm and purchase from outside. The future stock of working cattle will be furnished by the calves from the Kangayam cows by the stud bull of that breed, who is showing himself a good stock-getter. A separate dairy herd will be kept for the needs of the dairy and for the supply of milk to the staff. The cattle are at present suffering from a bad attack of foot and mouth disease, and though only one calf has died, it causes great loss by putting all the farm cattle out of action for at least a fortnight, while the cows attacked tend to go dry.

A series of feeding experiments have been commenced and will be continued as they should yield valuable results in a little known field. Some forest hay, as sold by the Forest Department, was tested against ragi straw and was found to be little inferior, while a comparison of cholam and paddy straw seems to show that the poor value generally put on the latter is not altogether correct.

A great deal of levelling, draining, building and road-making has been carried out during the year and more remains yet to do. There is now one central steading for the whole area, where formerly there were four or five, and this has necessitated a good deal of rearrangement of roads and fields. The arrangements for storing grain have been much improved by a new drying floor constructed so that it opens directly from the store rooms. Three of the wells have been cleared of silt and one permanently improved. The staff has been increased during the year but is barely able to cope with the work. At present there is an Assistant Farm Manager for each block, with one in reserve for touring work and for relieving any one who takes leave. The Farm Manager supervises the work of all, and with the Office Manager, the store-keeper, the Farm clerk, and the Mechanic, are responsible for the whole of the work of the farm. The Veterinary Assistant is in general charge of the cattle and the Engineering Assistant is in expert charge of all constructional work done departmentally, besides carrying out tests of implements and machinery, on which the opinion of the department is requested.

The financial position of the farm it may be interesting to consider. The total expenditure on the farm was Rs. 41,000 made up of Rs. 5,300 on salaries, and Rs. 35,700 on farm expenses. Nearly Rs. 4,000 have been spent in the purchase of cattle and plant and another Rs. 4,000 in new works, both of which are capital charges, while Rs. 4,000 went to the Botanical garden. The receipts have amounted to nearly Rs. 23,000, a figure which is satisfactory and which is accounted for by the favourable season.

COIMBATORE,
18th May 1910.

R. C. WOOD,
Principal and Superintendent.

APPENDIX III.

ANNUAL REPORT OF THE GOVERNMENT BOTANIST, 1909-1910.

I have the honour to forward the annual report of this office for the year 1909-1910.

2. During the year the main work was the settling of the various sections and their collections into their respective rooms in the Agricultural College at Coimbatore. Much of the furnishing has still to be done and a considerable quantity of apparatus has not yet been received, but the Assistants are now in full work and the teaching section is accommodated in the fine new laboratory.

3. *Changes in staff, leave, etc.*—The staff of the Government Botanist was strengthened by the addition of M.R.Ry. K. Ranga Chari, M.A., L.T., Acting First Assistant in the Teachers' College at Saidapet, who was transferred to Coimbatore on 14th October for a period of five years in connection with the teaching work. A Third Assistant in Entomology having been sanctioned, M.R.Ry. Padmanabha Aiyar, M.A., was appointed on April 10th and after a month's preliminary work at Coimbatore was sent to Pusa for training under the Imperial Entomologist.

A considerable amount of leave, largely on medical certificate, was enjoyed by the staff during the year, and all the menial subordinate staff left the office in preference to removing to Coimbatore from Madras. The Assistant in Systematic Botany was engaged in Madras in sending off the collections until June 6th when, on his transfer to Coimbatore, he obtained leave on medical certificate and did not return to duty during the year. The second Plant Collector and Artist were each absent for a period of three months, the third Plant Collector and second clerk were absent for five and three months, respectively, on loss of pay, besides which many minor periods of leave have been granted.

4. *Work of the Government Botanist.*—During the earlier part of the year much of the actual teaching fell on the assistant in Economic Botany, the Government Botanist preparing the lectures and supervising the practical classes. This left some time for research. A detailed study was commenced of the cottons of the Presidency and some progress was made towards laying down a series of experiments for their improvement. But upon receipt of instructions to that effect, the whole of the teaching passed directly under the Government Botanist's control and research became impossible. The teaching during the year has been very exacting. The term commenced on May 1st and was continued almost uninterruptedly until the examinations at the end of March. Two new courses in Botany were prepared and an elementary course in Zoology

was supervised. In Elementary Botany 35 lectures were delivered with 65 practical classes, while in Agricultural Botany 68 lectures were given and 102 practical classes held. Great difficulty was experienced in both these courses in adapting the teaching to Indian conditions and English text-books were found to be of little value. After the commencement of the teaching practically no touring was done. The Government Botanist was away from head-quarters for 36 days during the year, chiefly in studying the cotton crops at Bellary, Hagari and Nandyal farms.

5. *Systematic Botany*.—Owing to the continued absence of the Assistant, M.R.Ry. C. Tadulingam, and the impossibility of replacing him, work in this section was largely confined to keeping the herbarium in order. Arrangements made for the compilation of a flora of Madras by Dr. Cooke at Kew had to be given up because of the old age of that gentleman. The advent of M.R.Ry. K. Ranga Chari, however, has greatly strengthened reference work in this section because of his great knowledge of the Madras flora. While only 41 sheets were added to the collection, 164 species were named for various enquirers, chiefly Professor Nyson (86 numbers), the Deputy Director Northern Division (36 numbers, chiefly grasses) and Mr. Anstead (35 numbers, chiefly leguminous plants). The set of plants placed on one side during recent years for the Calcutta Herbarium received some attention and 600 sheets were written on and prepared for despatch, while 200 sheets collected by the Government Botanist were finally identified and placed in their cases.

6. *Economic Botany*.—Work in this section has had many vicissitudes during the year. As stated already considerable attention was devoted at the commencement to the cottons of the Presidency. During the latter part of the year this work has been placed in the hands of the (now) Second Assistant in Economic Botany, M.R.Ry. T. S. Venkataraman, whose enthusiasm and hard work deserve every commendation. Two series of plots, several hundred in number, were studied during the year. Crosses were made between two forms of the indicum, herbaceum and hirsutum types, with the idea of ultimately improving the Karunganni, Bourbon and Uppam cottons in Madras. Marked attention was paid as usual to Cambodia, a form which seems to be of great promise. Altogether 700 flowers were crossed and about 2,000 flowers were selfed during the year.

Similar work on a smaller scale was continued with gogu (*Hibiscus cannabinus*), *Mirabilis jalapa*, *Clitoria ternatea* and others, for the study of Mendel's laws.

At the request of the Director of Agriculture observations were made on the cumbus (*Pennisetum typhoides*) growing on the farm. The forms of the flowers and the rates of protrusion of the stigmas were studied and a certain number of crossings were effected. A set of 12 plants received from the Principal were subjected to a detailed analysis and the seeds kept for further sowing.

The red grams (*Cajanus indicus*) and horse grams (*Dolichos biflorus*) on the farm were similarly studied and the seed kept separate for sowing. It is hoped to gradually extend this work to all the crops of the farm.

A large number of castors were collected from various sources with the idea of future work in eri silk cultivation. Thirty-two plots of these, mostly received from Pusa, were sown, but the types were so impure that about a dozen of the best were selected, self fertilised and saved in order to get pure seed for next season. A couple of kinds of mulberry were meanwhile successfully introduced into the Botanic garden.

Some progress was made in the study of the germinative power of seeds and a standard collection of seeds of all kinds has been commenced.

Considerable activity was shown in the collection for the College, of typical economic products of the Presidency. A fieldman was on tour for 127 days in Coimbatore, South Canara and Malabar and some 180 numbers were collected, with detailed notes as to their uses and modes of cultivation.

Collections of economic products were made for the Ceylon Agricultural Society and the Lahore Exhibition and over 100 sets of specimens were forwarded.

7. *Botanic Garden*.—The Botanic garden was maintained and greatly improved in appearance during the year. It was extensively used both for carrying out the economic research work and the teaching in the College. A plan was made and the area divided up into blocks, and a permanent record of the operations in each recorded. Many trees were planted and new paths laid out. A rockery was added with a water pond for the growth of arid and water plants respectively. A small house was built for convenience in studying plants on the spot and keeping the tools and seeds under supervision. Owing to the failure of the monsoon rains little water was obtainable from the wells and these were cleared of silt, but the work generally suffered greatly from the lack of water, and other arrangements are under consideration to meet this need. The college compound was levelled and cleared and a number of trees planted. The Lawley avenue was kept under constant supervision and the trees pruned and kept in order.

8. *Mycology*.—The Mycological Assistant, M.R.Ry. S. Sundararaman, continued his period of training at Pusa and any enquiries received on fungoid pests were sent to him to be dealt with there. He returned to Coimbatore at the end of the year and joined the staff of Mr. McRae, the newly appointed Mycologist.

9. *Entomology*.—Work in the Entomological section was continued on the lines laid down by the Imperial Entomologist and reports were regularly sent to him of all work, for information and criticism. The staff consisted of two assistants trained at Pusa but there were no subordinates of any kind. A Third Assistant was added during the year.

The First Assistant, M.R.Ry. T. V. Ramakrishna Aiyar, on his return from the annual meeting at Pusa, devoted himself to placing the collections, hitherto kept in his own house, in the College rooms. He was in charge of the teaching in this subject throughout the year and kept the collections in order. A number of insect boxes were prepared locally according to the new method of lining with paraffin and a quantity of seed in the collections fumigated. A card index of the economic and systematic collections was started. The chief crop pests reported from districts and dealt with from head-quarters were the paddy stem borer, red hairy caterpillar, Deccan grasshopper, rice bug and surface grasshoppers.

Two short notes resulting from research were prepared under the editorship of the Imperial Entomologist for publication by the Bombay Natural History Society (1) Life history of a castor *Lymantria* and (2) Breeding Notes on *Eumenes Conica*.

Three short tours were made by the First Assistant during vacations.

The Second Assistant, M.R.Ry. Y. Ramachandra Rao, upon his return from Pusa attended to the transfer of the Entomological apparatus, etc., from Madras. After that he toured at regular intervals throughout the Presidency, being 185 days absent from head-quarters. He paid visits to Bellary, Kollipatti, Bezwada, Taliparamba and made a detailed study of the pests in three districts—South Canara, Malabar and Guntur. The most important work during the year was the study of *Leptiopa pygmaea* on paddy, the hairy caterpillar at Pannicupam in South Arcot, a serious grasshopper outbreak in the Hadagalli taluk of Bellary district (*Orthacris* sp.) and a grasshopper pest in Tinnevely.

The Third Assistant, M.R.Ry. K. S. Padmanabha Aiyar, reached Coimbatore after his year of training in the last days of the official year.

The artist proceeded to Madras and brought all the paintings and drawings to Coimbatore. He was then largely employed in making diagrams for class teaching but added about 15 paintings to the general collection, chiefly of new varieties of sugarcane. He availed himself of three months' privilege leave.

COIMBATORE,
23rd May 1910.

C. A. BARBER,
Government Botanist.

APPENDIX IV.

REPORT OF THE MADRAS AGRICULTURAL CHEMIST FOR THE YEAR 1909-1910.

I have the honour to submit herewith my annual report for the year ending 31st March 1910.

2. *Changes in staff*.—There were no changes in either the personnel or the duties of the staff but an unsuccessful attempt was made to fill the vacant post of Research Assistant.

3. *Analytical work*.—The present year has been marked by a large increase in the analytical work, the number of samples analysed being 395 as compared with 162 in 1908-1909. A pleasing feature of the year's work is the fact that samples of soil and manures were received from cultivators residing in various parts of the Presidency and there seems to be every probability of this branch of the work extending considerably in the near future.

The samples analysed may be classified as follows:—

Alkaline soils	21
Soils	56
Sugar-canes and sugar containing plants	129
Sugar-cane products	30
Ground-nuts and oil-seeds	59
Poonacs	9
Green-manures	5
Fish manure	11
Village and farm yard manures	5
Artificial manures	15
Miscellaneous manures	12
Food-grains and fodders	14
Waters	24
Silts and silty waters	
Total	395

4. *Investigations—(a) Soils.*—An important fact brought out by the year's work is the extreme poverty in lime of the soils derived from laterite. In several instances samples of soil were received which in every respect appeared to have been well manured and cared for, and yet were only capable of yielding poor crops. In these cases lime was found to be practically absent from the soil and this was the only feature brought out by the analyses which was capable of explaining the poor cropping. The importance of dressing such soils with lime or using manures rich in that element is apparent and experiments will be carried out in this direction when a pot-culture house is available.

(b) *Sugar containing plants.*—Several samples of aloes were received and the juice expressed from them was analysed. They were found to contain some sucrose but the proportion of glucose and other impurities was so high that there appears to be no hope of utilizing the juice for the production of sugar.

In the case of sweet sorghums the juice was found to be comparatively rich in sucrose and the purity of the juice was fairly high. In conjunction with the Principal, experiments are now being carried out to test their value from the point of jaggery making when grown as a dry crop.

(c) *Hadi's process for sugar-making.*—Some preliminary experiments were carried out with Hadi's apparatus. The apparatus appears to be incapable of concentrating the juice to the jaggery stage and in the manufacture of sugar the amount of inversion was considerable. The experiments will be continued this season at the Central Farm.

(d) *Manurial experiments.*—In conjunction with the Deputy Director of Agriculture, Northern Division, a series of experimental plots were laid down at the Hagari Farm with the object of ascertaining the effect of dressing the soil with lime or magnesium sulphate. The results of the first year's working appear to show that whereas farm yard manure and lime used separately do not materially affect the yields, yet when used in combination a marked improvement in the yield of fodder is produced accompanied by a decrease in the amount of grain. Magnesium sulphate in small doses depressed the yield of both grain and fodder but with somewhat heavier doses the yield was normal. On the other hand, when used in conjunction with farm-yard manure, the yield of grain was greatly increased but at the same time, less fodder was obtained. The crop grown was cholam in all cases.

Permanent experiments were laid down at Samalkota in order to obtain some data on the suitability of artificial manures for the cultivation of paddy, in conjunction either with green manuring or the use of poonac. It was found that the Samalkota soil responded to the application of either super or potash.

In the Kistna delta many of the demonstration plots laid down in the previous year were continued and it has been definitely shown that the mixed manures supplied are capable of producing good crops throughout two growing seasons. In addition to these demonstration plots, a number of purely experimental plots were started, the object of these experiments being in the first place to find the manure and system of manuring, best suited to the Kistna conditions of cultivation, and, secondly, to obtain some data with regard to the manurial requirements of paddy.

(e) *The gases given off from paddy soils.*—The gas given off from paddy soils was collected at regular intervals and analysed. The results showed that the evolution of gas was due to an anaerobic fermentation and that the gas contained a very considerable proportion of nitrogen. The latter is probably derived from the organic matters used as manures and constitutes a serious loss to cultivation. Experiments will be carried out this year to determine the effect of different methods of cultivation on the composition of gas.

5. The energies of the two assistants deputed to the Research section are fully utilized with the routine analytical work of the department and the First Assistant has been deputed to carry out in his spare time the analytical work necessary for the control of the dairy. The pot-culture house will soon be completed and the necessary work in connection with it will fall upon the present staff to the detriment of their present duties. Under these circumstances the appointment of another assistant is urgently called for.

6. *Tours.*—During the present year the Agricultural Chemist was on tour for 51 days and the members of his staff for 106 days.

COIMBATORE,
2nd May 1910.

W. H. HARRISON,
Agricultural Chemist.

II

SECTION I.—ANNUAL REPORT OF THE SUPERINTENDENT, CIVIL VETERINARY DEPARTMENT.

I

I have the honour to submit the report of the Civil Veterinary Department for the year 1909–1910.

2. The office of the Superintendent, Civil Veterinary Department, was held by Lieutenant-Colonel W. D. Gunn till the afternoon of the 7th December 1909 when I took charge. After 12 days, I was obliged to take privilege leave for 25 days, including Christmas holidays, and to go back to Lahore on private business. Mr. D. Aitchison, Principal of the Madras Veterinary College, officiated for me during the period.

3. Lieutenant-Colonel W. D. Gunn spent in camp 127 days, travelled 7,661 miles by rail and 502 miles by road. He paid two visits to each of the hospitals at Trichinopoly and Madura and one visit to those at Vellore, Tiruvannamalai, Coimbatore, Ellore, Rajahmundry, Cocanada, Pithapuram, Vizianagram, Berhampur, Bellary, Saidapet, Trichur, Pudukkottai, Tinnevely and Tanjore. He also inspected the quarantine station at Tuticorin and attended the Cattle show at Madura.

4. I was on tour for 56 days in camp and travelled 4,108 miles by rail and 23 miles by road. I attended the Cattle shows held at Ongole, Ellore, Pithapuram, Berhampur and Kottavalasa and had occasion to inspect the Veterinary Hospitals at Bellary, Tinnevely, Madura, Sivaganga, Trichinopoly, Tanjore, Ongole, Ellore, Pithapuram, Cocanada and Berhampur and also the quarantine station at Tuticorin.

5. A separate report will be submitted by the Principal, Madras Veterinary College.

II.—CATTLE DISEASE.

6. The total number of deaths among cattle during the year was 1,22,800, of which, 1,10,073 was due to disease and 12,727 to other causes. As compared with the previous year there was a decrease under each heading of disease except "Malignant sorethroat" which showed a slight increase of mortality. The decrease was very considerable under "Rinderpest" so much so that it gave a favourable turn to the tide of mortality that was during the last quinquennium rising year after year. This happy circumstance is evidently attributable to the preventive measure of inoculation carried on by Veterinary Assistants in all parts of the Presidency and to the treatment of the sick animals in the course of their tour. It is, however, very difficult to give any reliable statistics, and it may be due to the fact that all deaths have not been reported during the year.

7. The loss from rinderpest was 56,900 against 1,49,666, i.e., 62 per cent. less than in the previous year. The districts that suffered most were Malabar (6,859), North Arcot (5,129), Coimbatore (4,637), Madura (4,363), Chingleput (3,992), South Arcot (3,883), Trichinopoly (3,638) and Tinnevely (3,147). In order to check the spread of this outbreak, a Veterinary Assistant was posted to each of these districts. Deaths from unspecified diseases were 26,587 against 38,100 in the previous year. The falling off in the number is probably due to the more careful recording of mortality under appropriate headings. Wild animals accounted for 11,124 and criminal poisoning for 50 deaths.

8. Preventive inoculation against rinderpest was carried on in almost all the districts in the presidency and 46,952 head of cattle were inoculated against rinderpest, 36 against anthrax in the Nellore district and 797 against charbon symptomatique in Tanjore, Vizagapatam and Nellore districts.

9. Inoculation against anthrax has been abandoned and that against hæmorrhagic septicæmia suspended under the orders of the Inspector-General, Civil Veterinary Department.

10. The total mortality among horses and ponies was 356, of which 186 was due to disease, 31 to snake-bite and 139 to wild animals.

III.—VETERINARY HOSPITALS.

11. At the commencement of the year there were 17 Veterinary hospitals at work, including the Veterinary hospital attached to the Madras Veterinary College for which a separate report will be submitted by the Principal. During the year five Veterinary hospitals were started, one in each of the following towns:—

- | | |
|-----------------------|--------------------|
| (1) Ongole, | (4) Sivaganga, and |
| (2) Tinnevely Bridge, | (5) Sivagiri. |
| (3) Berhampur, | |

Of these 22 Veterinary hospitals, eight, located at Madras, Saidapet, Tiruvannamalai, Sivaganga, Tinnevely Bridge, Ellore, Rajahmundry and Ongole, were maintained by Government. The dispensary at Ongole has since been transferred to the Local Board, while that at Tiruvannamalai was handed over to Government by the Local Board from 1st January 1910. The dispensaries at Berhampur, Vizagapatam, Cocanada, Coimbatore, Vellore, Trichinopoly, Tanjore and Madura are supported by, and are under the direct control of, the Local Boards concerned; four, at Vizianagaram, Pithápuram, Trichur and Pudukkóttai, are carried on by their respective Rajas, one at Sivagiri by its Zamindar and one at Bellary is conducted under the auspices of the Society for the Prevention of Cruelty to Animals and receives an annual donation in aid of its funds.

12. Proposals for starting Veterinary hospitals at Conjeevaram, Nellore, Kurnool, Erode, Amalapuram and Bobbili are under consideration.

13. The new hospital at Sivaganga receives contributions from the Court of Wards, Local Board and the European lessees, while it is under the direct control and management of this department.

14. The total number of in and out patients treated at these institutions is shown in statement No. V and the receipts and expenditure in statement No. VI. The total number of in-patients treated in all these institutions except Madras, Pudukkóttai, Trichur, Berhampur and Sivagiri is 24,803 which yields an average of 1,459 patients for each institution or about four patients per diem. This compares favourably with the figures of last year and the increase in the number of attendances is particularly noticeable in the Veterinary hospitals at Trichinopoly, Coimbatore, Vellore, Vizianagaram, Pithápuram, Rajahmundry and Cocanada.

IV.—PONY-BREEDING OPERATIONS.

15. At the commencement of the year there were 12 stallions on the rolls. They were located in the districts of Coimbatore, Salem and Madura, the places selected as suitable for the pony-breeding operations. In Coimbatore 8 stallions were stationed for the most part of the year.

'Jumna' located at Kangayam covered 27 mares against 23 in the previous year.

'Rahiman' was stationed at Pollachi throughout the year and he served 27 mares against 25.

'Punch' remained for four months at Kangayam and eight months at Dhárápura and covered 18 mares against 28.

'Ali' was located for eight months at Kangayam in the Coimbatore district and four months at Shoolagiri in the Salem district. He served 14 mares in the former and 6 in the latter district.

'Ahmed' whose services were required both at Dhárápura and Karúr in the Coimbatore district was credited with the highest number of coverings (viz.), 49 against 34 in the previous year.

'Mustapha' located first at Tiruppúr and then at Kollegal served 30 mares against 22.

'Turk' stationed at Satyamangalam throughout the year covered 8 mares against 10.

'Sheik' was located in Madura till May and was then transferred to Kollegal in the Coimbatore district, where he remained till December and covered 11 mares. He was next required at Trichinopoly but was found too high for the local mares. He nevertheless covered 9 mares there.

'Carbon' was stationed partly at Erode in the Coimbatore district and partly at Harur and Shoolagiri in the Salem district. He was able to cover only 4 mares in all, being too old for better service.

'Samawy' who was stationed for 11 months in Védasandúr in the Madura district and one month at Hosúr in the Salem district, covered 32 mares in the former and 1 in the latter station.

'Sunshine' whose services were in requisition both in the Madura and Salem districts, served in these districts 12 and 17 mares respectively, making a total of 29 as in the previous year.

'Selim' remained in the Salem district throughout the year and covered 12 mares. The total number of coverings made during the year was 184 in the Coimbatore, 40 in the Salem and 44 in the Madura district against 153, 47 and 39 respectively in the previous year. In addition to these there were 9 coverings made in the Trichinopoly district. On the whole, there were 277 coverings against 239 in the previous year and the average number of coverings per stallion was approximately 23 against 17.5 last year.

16. *Results of coverings.*—On the whole there were 239 coverings during the previous year in the districts of Coimbatore, Salem and Madura. Of these, results have been reported in 230 cases. From the reports received, it would appear 188 foaled, 2 aborted, 5 are in foal, 6 proved barren, 5 are doubtful and in 14 cases whereabouts are not known.

17. *Castrations.*—These operations were carried on by salustries in the Coimbatore and Salem districts. Four ponies and one bull were castrated at Pollachi, 5 ponies and 97 bulls in Dhárápura, 2 ponies in Kollegal, 2 ponies and 78 bulls in Hosúr. The total number of operations performed during the year was 189 against 296 in the previous year. The falling off in the number of castrations is due to two salustries having been on leave, one for three months and the other for two months.

18. *Cattle-breeding.*—Of the 20 bulls purchased for breeding purposes, 2 died and 1 was disposed of by auction. The remaining 17 bulls were distributed among six districts—Ganjám, Vizagapatam, Guntúr, Madras, Madura and Tinnevely. With the exception of the three bulls attached to the Veterinary hospitals at Berhampur, Vizagapatam and Madura and two bulls attached to the Madras Veterinary College, all these bulls are let loose to graze with the herd of cows and it is not therefore feasible to maintain any reliable register of coverings made by them. As far as could be ascertained, the average number of coverings made by each bull ranged from 2 to 10 per mensem. As it is not possible to expect regular reports on the results of coverings from the owners of the cows covered, arrangements are being made to gather the information through the Veterinary Assistants and Inspectors touring in the districts by means of local enquiries.

V.—CATTLE FAIRS AND SHOWS.

19. A large number of cattle fairs were held during the year in several districts. But it was possible to depute a Veterinary Assistant to enforce the provision of the Cattle Diseases Act, II of 1866, only to twelve of these fairs, viz., those held at Kanniseri, Azhivartirunagiri, Muthulapuram, Sankaranayinarkóvil, Thimmarajapuram, Kalugumalai, Sivalaperi and Tiruchendúr in the Tinnevely district.

Tiruvannamalai and Melmalayanur in the South Arcot district, and Subramaniapuram and Kulgunda in South Canara district. From the reports received from the Veterinary Assistants who attended these fairs, it would seem that 1,47,410 animals were assembled and exhibited for sale.

In a few fairs, rinderpest and epizootic apthra broke out, but their progress was checked by means of suitable arrangements made by the Veterinary Assistant on the spot and there were few or no casualties. Occasion was taken to demonstrate to the people assembled the method of inoculation and the advantages arising therefrom.

20. During the year eight cattle shows were held, two at Ongole and one at each of the following places:—

Madura.	Ellore.	Berhampur.
Samayavaram.	Pithapuram.	Kottavalasa.

21. Of the two shows at Ongole, one was held in April 1909 and the other in February 1910; in the former there were only 608 entries, but in the latter 1,142—a number which was considered a record. Some very good cattle were to be seen at this show.

22. *Madura Cattle Show* was held in May 1909 in connection with the famous Chitral festival which attracts a great crowd from neighbouring districts. The number of animals gathered for sale is estimated at 18,000 of which only 338 were selected for exhibition. A large number of sales is said to have taken place at this fair.

23. *The Samayavaram Cattle Show* was held in December 1909 in connection with the great Vikunta Ekathasi festival at Srirangam, and it was organised by the District Board and attended by a Veterinary Assistant. From his report it would appear that the best animals exhibited were of the Alambadi breed and the number assembled at the fair was approximately 3,000.

24. *The Ellore Cattle Show* was held in February 1910. The best exhibits were all of the Nellore breed, the local breeds being beneath notice. If this show does not improve very much, Government's support should be withdrawn.

25. *The Pithapuram Cattle Show* took place in March 1910. There were 460 entries against 342 in the previous year. Some very fair cattle were exhibited at this show. Pony-breeding should have a future in this district if properly controlled.

26. *The Berhampur Cattle Show* was held in March 1910. The total number of exhibits was 802 against 920 in the previous year. None of the bulls or cows exhibited was considered worthy of Government silver medals which were accordingly withheld.

27. *The Cattle Show at Kottavalasa* in the Vizagapatam district was held in March 1910. There was a large falling-off in the numbers and quality of cattle as compared with the previous year. The only animals worthy of note were draught bullocks which were well represented and contained very fine specimens.

Dates of shows should be fixtures and should not be altered.

VI.—VETERINARY INSPECTORS AND ASSISTANTS.

28. During the year 21 Veterinary Assistants were mainly employed in attending to outbreaks of cattle disease, in informing the ryots of the benefits of preventive inoculation and in carrying on, by means of persuasion, the work of inoculation in the villages affected with infectious diseases. There were 593 outbreaks and the districts that were mostly affected by them were Malabar, North Arcot, Coimbatore, the Nilgiris, Chingleput, South Arcot, Trichinopoly and Tinnevely in each of which a Veterinary Assistant was employed to combat the epidemics by means of preventive inoculation and medical treatment. The difficulties that confronted the Veterinary Assistants on inoculation duty gradually disappeared and the ryots have begun to realise the utility of inoculation and in some districts, particularly Tanjore, they

render considerable assistance and active co-operation. The subjoined table shows the number of cattle inoculated for each disease during the last three years and statement No. III shows the number inoculated in each of the districts:—

Year.	Rinderpest.	Anthrax.	Charbon symptomatic.	Total.
1907-1908	28,914	8,461	..	37,375
1908-1909	50,487	2,353	..	52,840
1909-1910	48,101	36	797	48,934

The decrease in the total number of inoculations is partly due to the discontinuance of inoculation against Anthrax and the suspension of the use of Black legoids and Hæmorrhagic septicæmia vaccine and partly to the want of regular supply of serum from the laboratory at Muktesar.

With a view to facilitate the inspection and scrutiny of the work turned out by Veterinary Assistants, the Presidency has been divided into three circles—Northern, Central and Southern—to each of which a Veterinary Inspector is posted. These circles comprise the districts shown below:—

Northern Circle—						Head quarters.
Ganjam	...	...	...	...	...	Vizagapatam.
Vizagapatam	...	...	...	...	...	
Godavari	...	...	...	...	...	
Kistna	...	...	...	...	...	
Guntur	...	...	...	...	...	
Nellore	...	...	...	...	...	
Kurnool	...	...	...	...	...	
Central Circle—						
Chingleput	...	...	...	...	...	Madras.
South Arcot	...	...	...	...	...	
North Arcot	...	...	...	...	...	
Anantapur	...	...	...	...	...	
Cuddapah	...	...	...	...	...	
Bellary	...	...	...	...	...	
Madras	...	...	...	...	...	
Salem	...	...	...	...	...	
Southern Circle—						
Coimbatore	...	...	...	...	...	Erode.
Nilgiris	...	...	...	...	...	
Malabar	...	...	...	...	...	
South Canara	...	...	...	...	...	
Trichinopoly	...	...	...	...	...	
Madura	...	...	...	...	...	
Tanjore	...	...	...	...	...	
Tinnevely	...	...	...	...	...	

29. The duties of Veterinary Inspectors generally consist in (1) checking the diaries of Veterinary Assistants in their circles, (2) in co-operating with them in combating the outbreak of contagious diseases, (3) in assisting them in inoculating cattle by means of persuasion, in case the owners are reluctant to have their animals inoculated and (4) in instructing and guiding the Veterinary Assistants in case of doubts or difficulties in carrying out their work.

Veterinary Inspector V. P. Subrahmania Mudaliyar inspected the work of the Veterinary Assistants employed on inoculation work in the Chingleput district. He was on duty till 28th May 1909 when he availed himself of combined privilege leave and furlough for two years.

Veterinary Inspector M. Hassen Ali Sahib was posted to the Southern Circle till 1st December 1909 when he was transferred to the Central Circle. He inspected the work of Veterinary Assistants in the Coimbatore, North Arcot, Tinnevely, Chingleput and Cuddapah districts and attended the cattle shows held at Madura, Ongole and Ellore.

M.R.Ry. K. Kylasam Aiyar was appointed as Veterinary Inspector on 17th August 1909 and posted to the Central Circle till 1st December 1909 when he was transferred to the Southern Circle. On the tour of inspection he visited Chingleput, Salem, South Arcot, Bellary, Kurnool, Malabar, Coimbatore and Trichinopoly districts.

M.R.Ry. S. A. Padmanabha Pillai was in charge of the Coimbatore Veterinary hospital till 23rd June 1909 when he was appointed to act as Veterinary Inspector in the place of M.R.Ry. V. P. Subrahmania Mudaliyar who went on combined leave for two years. Posted to the Northern Circle, he carried on his inspection work in the districts of Vizagapatam, Bellary, Kurnool, Godavari and Kistna. He also attended the cattle shows at Kottavala and Kalyandrug and inspected the breeding bulls and treated elephants stationed in his circle. He castrated six animals and was on privilege leave for one month from 5th July to 4th August.

30. (1) Veterinary Assistant S. C. Jeyasing Raj was posted to Coimbatore district on inoculation work and was subsequently placed in charge of the District Board Veterinary hospital.

(2) Veterinary Assistant M. P. Kanniah Nayudu was engaged on inoculation duty in Madura and Chingleput and also treated 26 animals in the course of his tour. He also acted for a month in the Veterinary hospital at Rajahmundry during the absence of the permanent incumbent on privilege leave. In the latter part of the year he was appointed to be in charge of Veterinary hospital at Sivaganga.

(3) Veterinary Assistant A. Rajappa was attending to inoculation of cattle in Ganjam, North Arcot and Cuddapah districts and treated Government elephants at Russellkonda (Ganjam district). He was on privilege leave for one month.

(4) Veterinary Assistant A. Ramachendra Aiyar inoculated 1,784 animals in South Arcot and Coimbatore districts. He also attended the cattle fair at Mailam and treated Government stallion "Punch" and in the course of his tour he had occasion to treat 144 head of cattle.

(5) Veterinary Assistant P. Velayudha Mudaliyar posted to Salem and North Arcot districts was able to inoculate 1,671 animals against rinderpest and treated 23 animals. He took privilege leave for one month.

(6) Veterinary Assistant V. Aiyasawmi Pillai chiefly attended most of the cattle fairs held in the Tinnevely district and enforced the provisions of the Cattle Diseases Act II of 1866. He also inoculated 1,104 and treated 96 animals and castrated one pony.

(7) Veterinary Assistant P. Virabadrudu Pantulu, who was on inoculation duty, was on leave on loss of pay for eight months.

(8) Veterinary Assistant K. Dorasawmy Nayudu, was posted to the Nellore district, inoculated 2,598 and treated 236 animals. He also attended the Cattle Shows held at Ellore, Pittapur and Berhampur.

(9) Veterinary Assistant A. L. N. Somayajulu Pantulu was employed in Vizagapatam and Ganjam districts. He inoculated 2,102 and treated 200 animals. He took leave for 20 days on loss of pay.

(10) Veterinary Assistant C. Suryanarayanamurthi Pantulu worked in the Kistna and Anantapur districts, inoculated 1,824 animals and castrated one pony. He also treated 250 animals.

(11) Veterinary Assistant K. Seshagiri Rao, who worked in Guntur, Anantapur and Kistna districts, inoculated 1,202 and treated 250 animals. He also attended the cattle show held at Ongole and inspected and reported upon Government breeding bulls stationed in the Guntur district.

(12) Veterinary Assistant K. S. Natesa Aiyar who was posted first to Kurnool and then to Salem district inoculated 2,505 and treated 751 head of cattle.

(13) Veterinary Assistant C. Venkataratnam Chetty employed in the Cuddapah, Bellary and Kurnool districts, inoculated 2,560 animals and treated 16.

(14) Veterinary Assistant M. Audimula Mudaliyar, who worked in Chingleput and Trichinopoly districts, inoculated 3,052 animals, castrated 11 and treated 139. He also attended the cattle show held at Samayavaram in the Trichinopoly district and was for a period of 1½ months placed in charge of Vellore Hospital in the North Arcot district.

(15) Veterinary Assistant K. R. Krishna Aiyar was on inoculation duty in Trichinopoly and Madura districts. He inoculated 2,733 animals and treated 137.

(16) Veterinary Assistant V. M. Subbarama Aiyar worked in North Arcot, Bellary and Malabar districts. He inoculated 2,825 and treated three animals. He was on privilege leave for one month.

(17) Veterinary Assistant P. Chidambara Nadar inoculated 1,724 animals in the Coimbatore, the Nilgiris and the Anantapur districts. He also attended the cattle fair held at Kalyandrug in the Anantapur district.

(18) Veterinary Assistant T. S. Alagappa Pillai who was posted to the Tanjore district throughout the year was able to inoculate against rinderpest so many as 7,268 head of cattle, the highest number inoculated in any district during the year. He also treated in the course of his tour 41 animals.

(19) Veterinary Assistant M. Hason Hazari Sahib inoculated 2,485 animals in Salem and South Arcot districts, treated 12 animals, attended the cattle fair held at Tiruvannamalai in South Arcot district and was subsequently placed in charge of Veterinary Hospital at Tinnevely Bridge.

(20) Veterinary Assistant S. S. Theetharappa Mudaliar worked in Tinnevely district, inoculated 2,586 animals and also attended a few cattle fairs in the district. He was on leave for two months on loss of pay.

(21) Veterinary Assistant A. Castelino was on inoculation work in South Canara district and treated 91 animals.

(22) Veterinary Assistant M. James was employed in the Nilgiri and Malabar districts on inoculation work. He officiated for 20 days at the Vellore Veterinary Hospital during the absence of the permanent incumbent on privilege leave and was subsequently placed in charge of Veterinary Hospital at Tinnevely Bridge. He was on privilege leave for one month.

(23) Veterinary Assistant V. Krishnamurti Aiyar inoculated 685 animals belonging to the Madras Corporation and 219 in the Nilgiri district. He also attended the cattle show held at Madura and was subsequently transferred to the Veterinary Hospital attached to the Madras Veterinary College.

31. The following graduates were employed during the year:—

(24) Veterinary Assistant M. N. Ahmed Saheb who was employed in June 1909 worked in the Kistna and Kurnool districts and inoculated 1,282 animals.

(25) Veterinary Assistant M. Sundaranathan was on inoculation duty in Bellary and Tanjore districts.

(26) Veterinary Assistant C. R. Veeraswami Sarma inoculated a few animals in Madras and Bellary.

(27) Veterinary Assistant L. Subrahmania Aiyar was engaged in the North Arcot district on inoculation duty.

(28) Veterinary Assistant P. V. Ramaswami Aiyar did inoculation work in the Trichinopoly district.

(29) Veterinary Assistant T. R. Rajagopal Rao inoculated a few animals of the Madras Corporation and was then posted to the Madura district.

(30) Veterinary Assistant V. Kunchi Ramian Nair who entered service in February 1910 was employed in the Malabar and the Nilgiri districts on inoculation work. He castrated one animal.

(31) Veterinary Assistants W. A. Douglas, V. R. Sangameswara Sastri, S. Kesavulu Nayudu and M. Thandeswara Aiyar resigned their appointments during the year.

32. There can be little doubt that Veterinary Assistants in districts find it very difficult to exist on the very small pay they receive and if Government could see their way to put the subordinate department on the same basis as that of Bombay and Sindh, I am confident it would help to increase the proficiency and zeal of the staff. This matter has been represented before by former Superintendents. It would perhaps be too much at present to ask Government to promote men to the Deputy Superintendent grade, but more inspectorships might be granted and one Deputy Superintendent would encourage men to work for a future advancement.

Fifty-one thousand doses of anti-rinderpest serum and 5,000 charbon symptomatique pilules were received during the year from the Imperial Bacteriologist.

W. O. DAWSON, Captain, A.V.C.,
Superintendent, Indian Civil Veterinary Department.

TABLE I.—Abstract showing main results of Veterinary Colleges and Schools during the year 1909-1910.

Veterinary College and Schools.	Name of course of instruction if more than one course followed.	Number of students.					Students admitted during the year classed by educational qualifications.			
		Admitted during the year 1909.		Passed final examination during the year.	Failed to pass final examination.	Remaining under instruction at the end of the year 1909.		Matriculated with higher qualifications.	Knowing English but not matriculated.	Knowing very little English.
		Scholarship holders.	Others.			In ordinary course.	Instruction prolonged by reason of failure.			
1	2	3	4	5	6	7	8	9	10	11
Veterinary College, Madras.	..	10	20	12	9	58	9	3	27	..

Veterinary College and Schools.	Receipts.			Expenditure.			Employment of students passed out during three years preceding.				
	From fees.	From other sources.		Salaries of instruction staff.	Other expenses.	Total.	Total number passed.	In service of local bodies or Government.	In the service of other bodies.	In private practice.	Number unemployed.
		Total									
12	13	14	15	16	17	18	19	20	21	22	
Veterinary College, Madras.	Rs. A. P. 14,243 2 10	..	Rs. A. P. 14,240 2 10	Rs. A. P. 15,945 3 1	Rs. A. P. 8,224 0 0 (scholarship).	Rs. A. P. 19,169 3 1	53	* 37 British service. 3 Local Board.	1 Zamindari service. 5 Native states.	7	

* Includes one under Coorg Government and four resigned during the year.

TABLE II.—Showing number of deaths from contagious diseases amongst animals during the year 1909-1910.

Province.	Equines.					Bovines.				
	Glanders.	Anthrax.	Surra.	Dourine.	Other contagious diseases.	Total.	Rinderpest.	Foot and mouth disease.	Hemorrhagic Septicemia.	Black quarter.
1	2	3	4	5	6	7	8	9	10	11
Madras	..	14	..	..	..	..	56,900	3,260	6,954	4,404
Province.	Bovines—cont.			Others.						
	Anthrax.	Other contagious diseases.	Total.	Rabies.	Plague.	Hemorrhagic Septicemia.	Gillar.	Anthrax.	Other contagious diseases.	Total.
12	13	14	15	16	17	18	19	20	21	22
Madras	11,068	26,557	110,073	..	..	..	..	..	..	..

TABLE III.—Statement showing results of preventive inoculation during the year 1909-1910.

Districts.	Name of disease against which inoculation was carried out.	Method of inoculation followed.	Number of outbreaks in which inoculation was undertaken.	Number of animals which died un inoculated in course of outbreak.			Number of animals inoculated.			Number of animals which died after inoculation.		
				Equines.	Bovines.	Others.	Equines.	Bovines.	Others.	Equines.	Bovines.	Others.
1	2	3	4	5	6	7	8	9	10	11	12	13
1. Ganjam	..	..	12	..	33	..	..	328	191	..	..	..
2. Vizagapatam	..	..	22	..	287	136	..	1,291	67	..	..	..
3. Gódvári	..	..	9	..	117	..	..	700	125	..	..	..
4. Kistna	..	..	5	..	125	..	..	1,420	..	..	..	..
5. Guntur	..	..	10	..	212	..	..	1,200	..	..	..	..
6. Nellore	..	..	11	..	162	..	..	1,841	..	..	7	..
7. Chingleput	..	..	35	..	712	..	..	3,257	..	..	..	..
8. Madras	..	..	2	..	..	..	..	2,119	..	..	..	..
9. South Arcot	..	..	2	..	..	..	..	1,804	317	..	..	..
10. North Arcot	..	..	23	..	797	..	..	3,229	..	..	..	..
11. Salem	..	..	33	..	784	..	..	2,254	38	..	3	..
12. Coimbatore	..	..	30	..	323	450	..	2,790	63	..	4	..
13. Trichinopoly	..	..	69	..	910	..	..	2,487	..	..	..	..
14. Tanjore	..	..	14	..	540	..	..	7,116	..	..	..	..
15. Madurai	..	..	54	..	211	..	..	788	..	..	..	..
16. Nilgiris	..	..	9	..	586	439	..	4,601	..	..	1	..
17. Bellary	..	..	76	..	258	..	..	1,161	114	..	1	..
18. Anantapur	..	..	45	..	928	..	..	1,683	33	..	..	..
19. Cuddapah	..	..	29	..	416	..	..	1,490	..	..	..	..
20. Kurnool	..	..	16	..	655	..	..	1,251	28	..	10	..
21. Malabar	..	..	31	..	148	..	..	1,699	..	..	..	..
22. South Canara	..	..	12	..	2497	..	..	1,759	183	..	12	..
23. Total	..	..	14	..	292	..	..	46,952	1,149	..	38	..

Table III.—Statement showing results of preventive inoculation during the year 1909-1910—cont.

Districts.	Name of disease against which inoculation was carried out.	Method of inoculation followed.	Number of outbreaks in which inoculation was undertaken.	Number of animals which died uninoculated in course of outbreak.			Number of animals inoculated.			Number of animals which died after inoculation.		
				Equines.	Bovines.	Others.	Equines.	Bovines.	Others.	Equines.	Bovines.	Others.
1	2	3	4	5	6	7	8	9	10	11	12	13
Vizagapatam	Charbon Symp-tomatique.	Injection of black quarter pilules.	5	..	81	..	..	797	..	..	..	..
Nellore			5	..	81	..	..	797	..	..	..	..
Tanjore	Anthrax.	By serum alone.	..	..	..	..	..	36	..	..	..	..
Nellore			..	..	..	..	..	36	..	..	..	..

TABLE IV.—Statement showing the number of animals treated and castrated by Veterinary Assistants and by Salustries on tour during the year 1909-1910.

Province.	Number of villages visited.	Number of veterinary assistants or salustries employed.	Castrations performed.				Treated for contagious diseases.				Treated for non-contagious diseases.				Total number of cases treated and castrations performed.
			Equines.	Bovines.	Others.	Total.	Equines.	Bovines.	Others.	Total.	Equines.	Bovines.	Others.	Total.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Madras	By Veterinary Assistants.	..	2	17	1	20	..	..	..	..	95	1,557	217	1,869	1,869
	By Salustries	..	13	176	..	189	..	..	..	..	..	..	..	..	189
	Total	..	15	193	1	209	..	..	..	..	95	1,557	217	1,869	2,058

TABLE V.—Statement showing the number of animals treated at Veterinary Hospitals during 1909-1910.

Province.	Number of veterinary dispensaries.		In-patients.															Balance on 31st March 1910.
	Number of Veterinary Assistants employed at dispensaries.		Remaining on 1st April 1909.			Admitted during the year.			Total.			Discharged during the year.						
			Equines.	Bovines.	Others.	Equines.	Bovines.	Others.	Equines.	Bovines.	Others.	Equines.	Bovines.	Others.	Equines.	Bovines.	Others.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Saidapet	1	1	4		11	54	17	113	58	17	124	54	13	118	4	4	6	
Vellore	1	1	5	9	1	51	73	5	56	82	6	51	79	5	5	3	1	
Madura	1	1	5	1		54	6	7	59	7	7	58	7	7	1			
Trichinopoly	1	1	7	17	4	138	162	53	145	179	57	140	168	54	6	11	3	
Coimbatore	1	1				110	10	3	114	10	3	110	10	3	4			
Vizianagaram	1	1	4		2	27	18	40	30	22	42	29	19	29	1	3	13	
Vizagapatam	1	1	3	4		4	4		4	4		4	4					
Pithapuram	1	1			2	90	127	125	94	131	127	89	129	124	5	2	3	
Bellary	1	1	4	4			8	9		8	9		8	8			1	
Rajahmundry	1	1																
Cocanada	1	1																
Ellore	1	1				6	22		6	22		6	22					
Tiruvannamalai	1	1																
Tanjore	1	1		2		46	61	18	46	63	18	45	60	18	1	3		
Sivaganga	1	1																
Tinnevely	1	1																
Sivagiri	1	1																
Berhampur	1	1																
Ongole	1	2																
Trichur	1	1																
Podukkottai	1	1																
Total	21	22	32	37	20	580	508	373	612	545	393	586	519	366	26	26	27	
Madras	1	1	26	32	13	483	167	425	509	199	438	487	181	426	22	18	12	
Grand total	22	23	58	69	33	1,063	675	798	1,121	744	831	1,073	700	792	48	44	39	

Province.	Out-patients.																
	Number treated during the year.			Average daily attendance.			Total number of in- and out-patients treated during the year.			Total.	Receipts.	Expenditure					
	Equines.	Bovines.	Others.	Equines.	Bovines.	Others.	Equines.	Bovines.	Others.								
	19	20	21	22	23	24	25	26	27				28	29	30		
Saidapet	116	498	239	5-07	14-26	11-39	173	515	363	1,051	RS. A. P.	1,058 14 1					
Vellore	134	419	357	8-5	14-3	6-5	190	501	363	1,051	238 14 0	1,517 10 8					
Madura	199	483	154	10-64	13-8	4	258	490	161	909	80 14 0	1,595 13 2					
Trichinopoly	172	766	150	11	37	2	317	945	207	1,469	2,705 4 1	2,705 4 1					
Coimbatore	2,638	5,544	1,861	7-23	15-19	5-07	2,638	5,544	1,851	10,033	2,817 3 11	1,817 3 11					
Vizianagaram	384	146	216	14	2	3	498	155	219	872	1,569 8 0	1,398 1 9					
Vizagapatam	108	203	362	5-4	7-89	6-97	138	225	404	767	2,019 11 0	1,328 1 5					
Pithapuram	191	819	847	5-797	16-243	12-693	195	823	847	1,866	..	2,434 0 0					
Bellary	451	692	643	14-1	28-6	14-6	545	823	770	2,138	3,937 3 0	3,937 3 0					
Rajahmundry	60	311	335	2-1	10-9	8-5	60	319	344	723	..	619 9 0					
Cocanada	192	486	588	..	18-9	..	192	436	588	1,216	182 7 0	2,401 15 10					
Ellore	87	446	169	2	10	2	87	446	169	702	..	627 5 6					
Tiruvannamalai	95	383	85	2-44	8-67	1-19	101	355	85	541	..	790 8 1					
Tanjore	212	481	146	5-8	1-3	4	258	544	164	966	1,853 10 7	1,969 13 5					
Sivaganga	7	77	16	1-3	6-67	7-5	7	77	16	100	15 2 0	238 6 0					
Tinnevely	91	141	57	5	5-6	1-8	91	141	57	289	..	..					
Sivagiri	..	..	..	..	..	..	..	..	..	..	..	..					
Berhampur	..	..	..	..	..	..	..	..	..	108	..	..					
Ongole	..	..	..	..	..	..	..	..	..	..	..	..					
Trichur	..	..	..	..	..	..	..	..	..	..	..	..					
Podukkottai	..	..	..	..	..	..	..	..	..	..	..	..					
Total	5,136	11,794	6,215	..	..	..	5,748	12,339	6,608	24,808	15,904 0 10	24,449 13 11					
Madras	308	142	483	7-5	2-0	9-07	812	341	921	2,074	14,243 2 10	39,641 15 1					
Grand total	5,439	11,936	6,698	..	..	..	6,560	12,680	7,529	26,877	30,147 3 8	64,091 13 0					

TABLE VI.—Abstract showing receipts and expenditure of Veterinary Dispensaries during 1909-1910.

Province.	Receipts.						
	Last year's balance.	By local fund grant	By Government grants.	By municipal contributions.	By fees.	By other sources.	Total.
1	2	3	4	5	6	7	8
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1. Saidapet	798 15 8	..	..	..	408 13 3	75 6 0	484 3 3
2. Vellore	1,974 4 5	..	120 0 0	110 0 0	..	8 14 0	238 14 0
3. Madras	1,716 2 2	..	..	..	80 14 0	..	80 14 0
4. Trichinopoly ..	Not received.	1,930 3 1	..	..	775 1 0	..	2,705 4 1
5. Coimbatore	339 8 0	1,817 3 11	..	..	..	1,000 0 0	2,817 3 11
6. Vizianagaram ..	1,188 15 8	1,669 8 0	..	..	..	..	1,669 8 0
7. Vizagapatam ..	420 1 7	1,520 0 0	..	..	499 11 0	..	2,019 11 0
8. Pithapuram	Not received.	..	..	..	..	..	..
9. Bellary	Do.	1,874 12 6	360 0 0	..	221 11 6	1,480 11 0	3,937 3 0
10. Rajahmundry ..	Do.	..	..	..	..	..	..
11. Cocanada	1,876 0 0	..	..	..	182 7 0	..	182 7 0
12. Ellore	181 2 5	..	..	..	..	..	..
13. Tiruvannamalai ..	1,015 14 5	..	..	..	..	..	..
14. Tanjore	4 8 0	1,754 0 0	..	..	99 0 0	0 10 7	1,853 10 7
15. Sivaganga	..	..	..	..	15 2 0	..	15 2 0
16. Tinnevely	..	..	..	..	..	..	..
17. Sivagiri	..	..	..	..	..	..	..
18. Berhampur	..	..	..	..	..	..	..
19. Ongole	..	..	..	..	..	..	..
20. Trichur	..	..	..	..	..	..	..
21. Pudukkottai ..	..	..	..	..	..	..	..
Total	..	10,465 11 6	480 0 0	110 0 0	2,282 11 9	2,565 9 7	15,904 0 10
Madras	25,586 7 3	..	..	..	14,243 2 10	..	14,243 2 10
Grand total ..	..	10,465 11 6	480 0 0	110 0 0	16,525 14 7	2,565 9 7	30,147 3 8

Province.	Expenditure.						Balance (excludes figures in column 2).
	Pay.	Travelling allowance.	Medicine & instruments.	Furniture.	Contingencies.	Total.	
9	10	11	12	13	14	15	
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1. Saidapet	984 3 1	..	..	..	..	1,088 14 1	584 10 10
2. Vellore	969 13 5	15 11 0	..	..	..	1,517 10 8	1,278 12 8
3. Madras	1,027 12 6	..	..	..	..	1,596 13 2	1,514 15 2
4. Trichinopoly ..	1,731 12 0	168 3 1	..	..	..	2,705 4 1	Nil.
5. Coimbatore	946 4 11	..	..	..	..	1,817 3 11	1,000 0 0
6. Vizianagaram ..	861 8 3	52 10 0	..	..	..	1,398 1 9	171 6 3
7. Vizagapatam ..	994 12 2	..	..	..	..	1,328 1 5	691 9 7
8. Pithapuram	1,194 0 0	360 0 0	..	..	..	2,434 0 0	2,434 0 0
9. Bellary	1,664 7 9	..	..	..	..	3,937 3 0	Nil.
10. Rajahmundry ..	506 0 0	..	..	..	..	619 9 0	619 9 0
11. Cocanada	1,288 5 0	..	..	..	..	2,401 15 10	2,219 8 10
12. Ellore	497 3 1	..	..	..	..	627 5 8	627 5 8
13. Tiruvannamalai ..	606 1 10	..	..	..	..	790 8 1	790 8 1
14. Tanjore	1,205 1 5	..	..	..	..	1,969 13 6	116 2 10
15. Sivaganga	182 0 0	30 4 0	..	..	..	238 6 0	223 4 0
16. Tinnevely	..	..	..	..	..	..	..
17. Sivagiri	..	..	..	..	..	..	..
18. Berhampur	..	..	..	..	..	..	..
19. Ongole	..	..	..	..	..	..	..
20. Trichur	..	..	..	..	..	..	..
21. Pudukkottai ..	..	..	..	..	..	..	..
Total	14,749 5 5	638 12 1	1,306 11 10	658 9 4	3,098 7 3	24,449 13 11	..
Madras	21,819 7 8	188 15 0	5,743 11 0	161 10 10	11,898 2 7	29,641 15 1	24,815 8 3
Grand total ..	36,598 13 1	826 11 1	11,050 6 10	820 4 2	14,796 9 10	64,091 13 0	..

TABLE VII.—Statement showing strength of subordinate Veterinary staff employed during the year 1909-1910.

Province.	How occupied.	Whether paid from Provincial or from Local funds.	Veterinary Inspector.	Veterinary Assistant.	Subordinate teaching staff.	Remarks.
1	2	3	4	5	6	7
Madras	Itinerating and attending cattle fairs and shows.	Provincial	3 *	25 †	..	* One of them was on furlough and one Veterinary Assistant acted for him. † Of these four were under training.
		Local Fund and Provincial.	..	15 ‡	..	‡ Including four having no lien on Government service and excluding one attached to Madras Veterinary College.
	In charge of hospitals.	Rajas and Zamindars.	..	5 §	..	§ Includes two in Cochin and one in Pudukotah States having no lien on British service.
	In charge of quarantine depot. College work	Society for the Prevention of Cruelty to Animals.	..	1	..	Having no lien on Government service.
		Provincial	..	1 ¶	4 **	¶ Hospital Surgeon ** One Assistant Principal and three Lecturers.
		Total ..	8	48	4	

Notes.—Eight Veterinary Assistants at Cocanada, Trichinopoly, Tanjore, Madras, Cochin, Pudukotah and Bellary have no lien on Government service.

TABLE VIII.—Return of stud bulls for the year 1909-1910.

Province.	Property of Government.					Property of local bodies.				
	1st Number on April 1909.	Obtained during the year.		During the year.		Obtained during the year.		During the year.		
1	2	No.	Average price paid.	Casualties.	Balance remaining on 31st March 1910.	No.	Average price paid.	Casualties.	Balance remaining on 31st March 1910.	
		3	4	5	6	8	9	10	11	
Madras	18	..	..	1 *	17	..	..	..	..	

* Sold by auction.

N.B.—The bulls are posted thus—one in Ganjam district, three in Vizagapatam district, eight in Guntur, two in Tinnevely, two in Madras and one in Madras.

TABLE IX.—Statement showing main results of the working of Provincial cattle farm during the year 1909-1910—*Nil*.

TABLE X.—Return of horse, pony and donkey stallions, under Government and local bodies, for the year 1909-1910.

Horse and pony stallions under local bodies.													
Details.	Horses.						Ponies.						Total horses and ponies.
	Arab.	Persian.	Thoroughbred English.	Country-bred.	Australian.	Total.	Arab.	Persian.	Country-bred.	Delhi.	Shan.	Total.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Balance on 31st March 1909	..	..	..	..	..	..	12	..	..	..	..	12	12
Increase. { By transfer.	..	..	..	..	..	..	..	..	..	..	..	..	..
{ Purchased in India	..	..	..	..	..	..	..	..	..	..	..	..	..
{ Received from Europe by purchase	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	..	..	..	..	..	..	12	..	..	..	..	12	12
Decrease. { Died	..	..	..	..	..	..	..	..	..	..	..	..	..
{ Sold	..	..	..	..	..	..	..	..	..	..	..	..	..
{ Destroyed	..	..	..	..	..	..	..	..	..	..	..	..	..
{ Transferred to ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	..	..	..	..	..	..	12	..	..	..	..	12	12*

Donkey stallions under local bodies.

Details.	Italian.	Cyprian.	Country-bred (Punjab).	Persian.	Catalonian.	Arab.	American.	Sicilian.	Total.
	15	16	17	18	19	20	21	22	23
Balance on 31st March 1909	..	..	..	..	..	..	..	..	..
Increase. { By transfer.	..	..	..	..	..	..	..	..	..
{ Purchased in India	..	..	..	..	..	..	..	..	..
{ Received from Europe by purchase	..	..	..	..	..	..	..	..	..
Total ..	..	..	..	..	..	..	..	..	..
Decrease. { Died	..	..	..	..	..	..	..	..	..
{ Sold	..	..	..	..	..	..	..	..	..
{ Destroyed	..	..	..	..	..	..	..	..	..
{ Transferred to ..	..	..	..	..	..	..	..	..	..
Total ..	..	..	..	..	..	..	..	..	..

* Under Government.

TABLE XI.—Services and produce of each class of horse, pony and donkey stallions under local bodies during the year 1909-1910.

Horse, pony or donkey.	Province.	Stallions on register on 31st March 1910.	Stallions actually employed at stud.		Number of mares covered.		Average number of mares covered per stallion employed at stud.		Remarks.
			Year under report.	Previous year.	Year under report.	Previous year.	Year under report.	Previous year.	
1	2	3	4	5	6	7	8	9	10
..	Madras	12 stallions.	12	13	277	239	23	17.5	

TABLE XII.—Average cost of feed, keep, attendance, etc., of horse, pony and donkey stallions during the year 1909-1910.

Province.	Horse.		Pony.		Donkey.		Remarks.
	Year under report.	Previous year.	Year under report.	Previous year.	Year under report.	Previous year.	
1	2	3	4	5	6	7	8
Madras ..	..	..	RS. A. P. 690 12 11	RS. A. P. 397 9 7	..	..	The total expenditure for upkeep alone of 12 Government stallions for the whole year amounted to Rs. 8,289-11-6.

TABLE XIII.—Abstract of particulars regarding horse fairs and shows held in non-selected districts during the year 1909-1910—*Nil*.

TABLE XIV.—Abstract of particulars regarding cattle fairs and shows held during the year 1909-1910.

Province.	Number of cattle fairs and shows held.	Total number of stock present.							Average price of animals sold.				
		Bulls.	Bullocks.	Cows.	Young stock.	Buffaloes.	Camels.	Others.	Bulls.	Bullocks.	Cows.	Buffaloes.	Camels.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cattle Fairs.													
Kanniseri	1	..	18,000	300	2,000	200	..	15	..	75	25	..	..
Azhwartinagari ..	1	..	6,000	..	..	..	..	..	..	..	..	..	..
Muthalapuram ..	1	..	12,000	175	1,000	300	..	25	..	..	..	..	..
Sankaranayinarkoyil ..	1	..	8,000	..	..	..	..	..	..	..	..	..	..
Thimmarajapuram ..	1	..	4,000	..	..	..	..	..	..	..	..	..	..
Kalugumalai .. .	2	..	40,000	75	1,900	800	..	..	..	85	47	..	..
Tiruchandur .. .	1	..	6,000	..	..	..	..	..	..	75	38	..	..
Sivalipari .. .	1	..	11,700	30	..	270	..	..	..	115	45	..	..
Thiruvannamalai ..	1	..	13,000	..	..	..	..	60	..	..	..	..	..
Melamalanur .. .	1	..	7,000	..	..	..	..	..	..	..	..	..	..
Subbramaniyapuram ..	1	..	700	..	..	..	..	..	..	..	..	..	..
Kulgunda .. .	1	..	2,302	..	..	4,351	..	..	..	..	..	..	..
Cattle Shows.													
Ongole .. .	2	411	102	419	534	92	..	192	..	..	..	..	..
Madura .. .	1	20	300	7	3	1	..	7	..	..	..	..	..
Samayavaram .. .	1	..	..	..	..	..	..	..	..	..	..	..	..
Ellore .. .	1	129	182	103	15	85	..	..	..	..	..	..	..
Pithapur .. .	1	53	121	62	56	79	..	84	..	..	..	..	..
Berhampur .. .	1	14	555	33	26	64	..	109	..	..	..	..	..
Kottavalasa .. .	1	34	206	24	20	55	..	14	..	..	..	..	..
Total .. .	21	686	130,169	1,228	5,554	6,297	..	496	..	..	..	..	..

	Amount realised in fees.	Total number of animals that competed for prizes.	Prizes awarded.							Amount actually awarded.	Number of medals.
			From Imperial funds.	From Provincial funds.	From local funds.	From other sources.	Total.				
			17	18	19	20	21	22	23		
Cattle Fairs.											
Kanniseri .. .	Rs. A. P.	20,515	Rs.	Rs.	Rs.	Rs. A. P.	Rs. A. P.	Rs. A. P.	..	..	
Azhwartinagari ..	..	6,000	..	..	..	..	..	..	..	..	
Muthalapuram ..	..	13,500	..	..	..	..	..	..	..	..	
Sankaranayinarkoyil ..	..	8,000	..	..	..	..	..	..	..	..	
Thimmarajapuram ..	..	4,000	..	..	..	..	..	..	..	..	
Kalugumalai .. .	..	42,775	..	..	..	..	..	..	..	..	
Tiruchandur .. .	..	6,000	..	..	..	..	..	..	..	..	
Sivalipari .. .	..	12,000	..	..	..	..	..	..	..	..	
Thiruvannamalai ..	..	13,050	..	..	..	..	..	..	..	..	
Melamalanur .. .	..	7,000	..	..	..	..	..	..	..	..	
Subbramaniyapuram ..	..	700	..	..	..	..	..	..	..	..	
Kulgunda .. .	..	6,653	..	..	..	..	..	..	..	..	
Cattle Shows.											
Ongole .. .	..	1750	..	3,000	2,835	1,653 0 0	6,988 0 0	4,867 0 0	6	6	
Madura .. .	..	338	..	..	525	70 0 0	595 0 0	290 4 0	1	1	
Samayavaram .. .	..	3,000	..	..	..	..	..	..	2	2	
Ellore .. .	9 13 0	514	..	250	350	1,152 13 9	1,762 10 9	330 0 0	3	3	
Pithapur .. .	..	450	..	..	..	800 0 0	1,300 0 0	1,233 0 0	4	4	
Berhampur .. .	828 15 8	802	..	..	..	930 14 10	2,030 14 10	659 0 0	5	5	
Kottavalasa .. .	..	353	..	..	..	700 0 0	1,600 0 0	1,018 0 0	6	6	
Total .. .	838 12 8	147,410	..	4,750	4,210	5,806 12 7	14,376 9 7	8,397 4 0	29	29	

TABLE XIV (a).—Statement showing the cost of the Civil Veterinary Department in the Province of Madras during the financial year 1909-1910.

Major heads.	Amount.			
	Imperial.	Provincial.	Local.	Total.
1	2	3	4	5
Civil Veterinary Department.				
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Superintendence ..	19,065 1 10	11,305 2 8	..	30,374 4 6
Subordinate establishment ..	..	25,702 11 9	..	25,702 11 9
Hospitals and dispensaries ..	..	2,932 13 4	14,953 4 5	17,886 1 9
Breeding operations ..	..	8,289 11 6	..	8,289 11 6
Prizes ..	..	3,145 0 0	1,065 0 0	4,810 0 0
Fairs and shows ..	..	..	..	..
Total ..	19,068 1 10	51,378 7 3	16,618 4 5	87,062 13 6
Madras Veterinary College.				
Veterinary instruction ..	7,628 8 0	31,313 7 1	Nil.	39,641 15 1

TABLE XV.—Comparative statement of cattle mortality for five years ending 1909-1910.

Causes of death.	Number of deaths among cattle for the year ending				
	1905-1906.	1906-1907.	1907-1908.	1908-1909.	1909-1910.
1	2	3	4	5	6
Diseases.					
Rinderpest ..	19,050	31,611	97,244	149,686	56,900
Anthrax ..	15,474	12,082	10,977	12,511	11,968
Malignant sore-throat ..	8,838	9,086	7,190	6,888	6,954
Black quarter ..	5,952	4,168	6,148	4,708	4,404
Epizootic apthia ..	4,074	2,794	3,544	4,578	3,260
Others ..	38,905	53,798	27,731	38,100	26,587
Total ..	90,293	113,539	152,834	216,451	110,073
Other causes.					
Snake bite ..	2,011	1,899	1,885	1,625	1,553
Wild animals ..	13,232	13,372	12,611	11,412	11,124
Criminal poisoning ..	58	43	56	26	50
Total ..	15,301	15,314	14,552	13,063	12,727
Grand total ..	105,594	128,853	167,386	229,514	122,800

TABLE XVI.—Statistics of mortality among cattle, horses and ponies in the several districts of the Madras Presidency during the year 1909-1910.

Districts.	Number of deaths among											
	Cattle											
	From diseases.								From snake-bite.	By wild animals.	From criminal poisoning.	Total.
	Kindred.	Diarrhoea and dysentery.	Anthrax.	Malignant sore-throat.	Black quarter or quarter ill or evil.	Epizootic apthia.	Others.	Total.				
1	2	3	4	5	6	7	8	9	10	11	12	13
1. Ganjam ..	2,812	..	645	495	237	421	754	5,364	55	193	..	..
2. Vizagapatam ..	808	..	731	435	770	239	401	3,394	47	143	..	..
3. Gódvári ..	1,152	..	1,387	538	195	166	1,849	4,817	105	384	..	..
4. Kistna ..	2,059	..	1,541	801	201	307	3,865	7,145	199	74	..	19
5. Guntur ..	814	..	163	526	289	72	521	2,366	47	22	..	..
6. Kurnool ..	613	..	1,026	245	459	83	3,542	5,968	91	393	..	..
7. Bellary ..	540	..	205	158	385	56	2,287	3,630	19	151	..	..
8. Anantapur ..	1,407	..	342	198	465	119	2,494	5,025	26	287	..	..
9. Cuddapah ..	1,480	..	638	199	176	60	1,076	3,620	32	360	..	..
10. Nellore ..	700	..	864	755	679	103	1,847	4,848	105	109	..	..
11. Chingleput ..	3,992	..	858	437	71	49	449	5,856	97	3	..	3
12. South Arcot ..	3,883	..	421	90	69	81	1,392	5,988	91	132	..	6
13. North Arcot ..	5,129	..	517	205	70	43	553	6,517	153	503	..	..
14. Salem ..	2,675	..	84	24	59	197	829	3,878	52	273	..	..
15. Coimbatore ..	4,637	..	104	197	179	513	1,339	6,969	34	556	..	..
16. Trichinopoly ..	3,634	..	311	94	10	381	1,754	6,188	51	97	..	..
17. Tanjore ..	2,845	..	504	399	27	50	448	4,273	98	1	..	2
18. Madura ..	3,147	..	602	251	49	180	893	6,338	92	187	..	4
19. Tinnevely ..	2,411	..	256	72	50	17	878	4,420	58	27	..	6
20. Nilgiris ..	6,859	..	3	19	5	16	169	2,923	3	249	..	4
21. Malabar ..	936	..	584	608	63	71	1,091	9,276	84	1,955	..	..
22. South Canara ..	..	..	192	190	15	6	275	1,614	13	5,147	..	..
Total ..	56,900	..	11,968	6,964	4,404	3,260	26,587	110,073	1,553	11,124	..	60

Districts.	Number of deaths among—cont.											
	Cattle—cont.											
	Horses and ponies.								From snake-bite.	By wild animals.	From criminal poisoning.	Total.
	Total.	Grand total.	Total stock by the latest census.	Diarrhoea and dysentery.	Anthrax.	Others.	Total.	Total.				
13	14	15	16	17	18	19	20	21	22	23	24	25
1. Ganjam ..	248	5,612	3,32,942	..	..	..	..	..	..	..	..	2
2. Vizagapatam ..	189	2,583	128,731	..	..	..	..	..	..	..	..	1
3. Gódvári ..	389	6,306	684,543	..	..	..	..	..	..	..	..	23
4. Kistna ..	275	7,420	1,214,756	..	..	..	..	..	..	..	..	19
5. Guntur ..	70	2,485	1,536,558	..	..	..	..	..	..	..	..	..
6. Kurnool ..	484	6,452	186,369	..	..	..	..	..	..	..	..	..
7. Bellary ..	170	3,800	502,860	..	..	..	..	..	..	..	..	..
8. Anantapur ..	313	5,338	1,548,723	..	..	..	..	..	..	..	..	..
9. Cuddapah ..	392	4,021	942,075	..	..	..	..	..	..	..	..	..
10. Nellore ..	214	5,062	972,975	..	..	..	..	..	..	..	..	..
11. Chingleput ..	102	5,958	662,898	..	..	..	..	..	..	..	..	..
12. South Arcot ..	229	6,165	1,182,089	..	..	..	..	..	..	..	..	..
13. North Arcot ..	556	7,173	896,082	..	..	..	..	..	..	..	..	..
14. Salem ..	325	4,203	1,090,690	..	..	..	..	..	..	..	..	..
15. Coimbatore ..	690	7,559	1,151,037	..	..	..	..	..	..	..	..	..
16. Trichinopoly ..	151	6,339	809,139	..	..	..	..	..	..	..	..	..
17. Tanjore ..	101	4,374	936,740	..	..	..	..	..	..	..	..	..
18. Madura ..	283	6,621	1,143,644	..	..	..	..	..	..	..	..	..
19. Tinnevely ..	91	4,511	1,590,898	..	..	..	..	..	..	..	..	..
20. Nilgiris ..	256	2,879	82,530	..	..	..	..	..	..	..	..	..
21. Malabar ..	2,039	11,315	966,058	..	..	..	..	..	..	..	..	..
22. South Canara ..	6,160	6,774	680,862	..	..	..	..	..	..	..	..	..
Total ..	12,737	122,800	18,882,073	28	14	144	186	31	139	..	270	356

SECTION II.—ANNUAL REPORT OF THE PRINCIPAL, MADRAS VETERINARY COLLEGE.

I have the honour to submit the Annual Report of the Madras Veterinary College for the year 1909-10.

2. The office of Principal was held by me throughout the year. The only change in the staff of the Madras Veterinary College during the year was the appointment of Mr. S. Sankaramurthia Pillai, B.M.V.C., from the Vizianagaram dispensary, as third lecturer, in place of Mr. Kylasam Aiyar, B.V.C., who was transferred to the Civil Veterinary Department of the Madras Presidency.

3. The selection of candidates for enrolment of students of the new class A was not made till 25th January 1909. The delay was due to the very few applications that were received up to the end of December 1908. After publication of the notice for applications in the local newspapers and subsequently in the *Fort St. George Gazette*, 70 candidates were selected by Colonel W. D. Gunn who was then Principal, out of which only 3 were Matriculates 67 non-Matriculates and 2 students who failed in the previous year's examination. Thirty of the most promising of these students were finally selected by me and retained in class A. In class B there were 17 students and in class C 21 students. Of these, 30 in class A, 16 in class B and 21 in class C continued their studies till the end of the year and appeared before the Board of Examiners with the following results:—

Class.	Year.	Number presented.	Number passed.	Percentage.
A ..	1909	30	20	66.6
B ..	"	16	10	62.5
C ..	"	21	12	57

Comparing the percentage of passes in December 1909 to that of 1908, it will be noticed that there is a distinct decline in all three classes. I had anticipated an unfavourable result throughout the year, and I attributed the lower percentage of passes to the very large number of non-matriculated and badly educated students admitted into the college during the three previous years.

4. Twelve students graduated from the college during the year out of which number only 7 have been selected by the Superintendent for service in the Civil Veterinary Department. I selected the students for the current year's A class on the 3rd January. The class promises well and consists of 1 F.A., 14 Matriculates, 4 non-Matriculates and 4 last year's failed students, making a total of 23 which is 3 more than the sanctioned number and is to allow for vacancies which may occur in the class from year to year.

5. I am pleased to be able to state that the attendance and discipline of the students during the year were satisfactory. The final year's students were afforded abundant opportunities for the performance of all surgical operations on the dead subject in classes which were conducted once or twice weekly throughout the sessions. The daily clinical work supplied ample practical hospital experience for all the classes under the superintendence of the officers in charge of the different wards and under my own supervision.

6. During the year the hospital attached to the college has continued to do good work, but it will be observed that there is a falling off of 800 in the number of patients treated during the year. I do not consider this decrease is due to unpopularity, but to the exceptionally good health maintained by the animals last year in Madras, and also to the increasing number of motor-cars and motor-cycles in use.

7. Below is a tabulated statement with receipts showing the number of patients treated from October 1903 :—

Year.	Total number of patients treated.	Receipts.		
		RR.	A.	P.
1903-1904 (from October)	778	2,238	4	6
1904-1905	1,981	6,364	12	1
1905-1906	2,213	7,091	13	1
1906-1907	2,249	6,846	7	10
1907-1908	2,313	8,438	0	0
1908-1909	2,873	11,462	0	0
1909-1910	2,074	14,243	2	10

The new system of collecting payment before discharge of patients partly accounts for the increase in the receipts for 1909-1910, and there is also included Rs. 2,000 from previous years' outstanding debts.

8. The number of operations performed during the year is shown below :—

Animals.	In-patients.	Out-patients.
Horses	232	122
Dogs and others	182	216
Bovines	100	64

9. Hospital Surgeon Mr. A. Douglas's services were placed at the disposal of the Superintendent, Civil Veterinary Department, during the year and Veterinary Assistant Mr. V. Krishnamurthi was appointed in his place and has performed his duties satisfactorily.

10. The museum was further equipped during the year. Valuable models and instruments were received from the Director-General of Stores.

11. The lucerne is still cultivated in the compound of the college and is invaluable for sick patients.

12. The Hon'ble Mr. A. E. Castle Stuart kindly consented to preside at the annual prize distribution and presented the diplomas and prizes to the successful graduates and students.

13. The college sports were held on the 19th of March 1910; all the events were keenly competed for. Seven silver cups and many other prizes were kindly presented by the retail business houses and other friends.

14. During the year, considerable extent of land adjoining the college grounds has been acquired by Government for a recreation ground for the students and for building purposes.

15. A Bacteriological Laboratory has been sanctioned which will supply a much-felt want in affording better facilities for the teaching of the contagious diseases of animals. A new pharmacy has also been sanctioned.

16. The hostel attached to the college accommodates 23 students and was full throughout the year. More rooms are urgently required. The health of the students during the year was good.

17. I have been ably assisted in my work throughout the year by the Assistant Principal and Lecturers.

18. A separate office establishment for the college was sanctioned—vide G.O., No. 1618, Revenue, dated 18th June 1909—and Mr. A. Parthasarathy Mudaliyar was appointed head clerk and Mr. S. Natesa Mudaliyar second clerk and typist, both of whom have carried on their work satisfactorily.

Note.—For tables vide those in section I.

D. A. D. ALCHISON, I.C.V.D.,
Principal, Madras Veterinary College.

GOVERNMENT OF MADRAS.

REVENUE DEPARTMENT.

Read—the following paper :—

Proceedings of the Board of Revenue (R.S., Sur., L.R. and Agri.),
No. 362, dated 1st August 1910.

The Hon'ble Mr. A. E. CASTLESTUART STUART, C.S.I.

The reports of the Director of Agriculture and the Superintendent, Civil Veterinary Department, on the operations of their respective departments and of the Principal of the Madras Veterinary College on the work of that institution for the year 1909-1910 will be submitted to Government.

2. *Staff.*—Two appointments of Assistant Directors were created during the year, to one of which M.R. Ry. D. Ananda Rao Garu, B. Sc., (Edin.) was appointed. His head-quarters have been fixed at Samalkota in the Northern Division. Mr. R. D. Anstead was recruited as a member of the Indian Agricultural service for 5 years and his services were placed at the disposal of the United Planters' Association of Southern India as Scientific Officer to help the planting industries, with headquarters at Bangalore. Mr. Shepperson's services having been determined at the end of his three years' agreement, Mr. Wood succeeded him as Principal of the College of Agriculture at Coimbatore and Mr. G. R. Hilson, who had been newly recruited, succeeded the latter as Deputy Director of Agriculture, Northern Division. The superior expert staff of the Agricultural Department received another addition in the person of Mr. McKae who was selected for the appointment of Mycologist. The addition of an Entomologist to the cadre of the Madras Agricultural Department, is still required to bring the equipment to the standard originally contemplated.

3. *Agricultural Stations.*—No new agricultural stations were opened during the year, so that the number of stations looked after by the department remained the same as in the preceding year. The Director of Agriculture proposed the abolition of the Bellary Farm, as the existing site was, in his opinion, unsuited for purposes of experimental cultivation. The consideration of this question has however been deferred by Government to the end of the year 1911. The pumping experiments hitherto conducted at the Hagari agricultural station for the experimental irrigation of black cotton soil have been given up under the orders of Government, and the station is hereafter to be run as a dry farm. The season at all the Agricultural stations was, on the whole, favourable except at Nandyal and Bezvada. Nevertheless, useful experimental and demonstration work was done at these as well as at other agricultural stations.

Sugarcane.—The Mauritius canes introduced into Gódvári have practically displaced the old canes. In South Arcot, where this cane was introduced only three years ago, there has been a rapid expansion of the area under cultivation, nearly 700 acres having been under that cane, out of a total area of 1,000 acres. It would appear that a quarter of the area planted is irrigated dry land, watered from wells. The superiority of this variety is demonstrated by the fact that its yield in juice is about twice that of the indigenous cane and it has the additional advantage of having a harder rind which makes the cane proof against the ravages of jackals, a source of great loss in the past. The cane has also been distributed to cultivators in South Canara and Malabar where it promises to thrive. The Board notes that the Barbadoes cane introduced by the Government Botanist and referred to in the report for

the year 1908-1909 aroused the keenest interest. It was also introduced into Malabar, South Arcot, Vizagapatam and Coimbatore and is stated to be a valuable acquisition to this country. The Board regrets to notice that there has been a recrudescence, though on a small scale, of "Red rot" at Samalkota farm but trusts that the efforts to eradicate the disease may prove successful.

Ground-nut.—The progress in the cultivation of this crop has been maintained on the West Coast, but experiments have shown that manuring will be necessary if the crop is to succeed there. In the north of the South Canara district a large variety of this crop, imported from the Bombay Presidency, seemed to suit the local conditions better than the Mauritius nut. Several other varieties have been tried in other parts of the Presidency with satisfactory results. The greatest obstacle to the rapid extension of the groundnut crop is the tendency in districts where the crop is new to grow it on the same land year after year. The question as to what cereals should be grown in rotation with groundnut is being studied at Palur.

Cotton.—The work on this crop at Koilpatti was continued during the year on the lines described in the previous year's reports. It has been proved that in this tract, Karunganni is superior to Uppam and that its re-establishment has been of great pecuniary advantage to both the grower and the spinner. The experiments conducted at Nandyal with the different varieties obtaining in the Ceded districts showed that there was little to choose between the "white northern" and "gadag", though the former was slightly better. The Board is glad to note that the seeds obtained from the trials made of the former variety have yielded cotton which, according to expert opinion, is decidedly better than that of the ordinary ryots' crops.

Cambodia cotton.—This is an acclimatised variety of American cotton which has come into prominence of late years in Tinnevely. It is gratifying to note that yields hitherto thought impossible in India have been obtained from it and that thousands of acres in the district are under this crop. Two points of advantage are mentioned in connection with this crop. The first is that the lint is superior to that of any of the indigenous cottons and will enable the Indian mills to produce yarns and cloth of better quality than is possible at present. The second is that it can be grown on land unsuited for the cultivation of indigenous cottons and gives a far higher yield. The Board trusts that the confident hopes entertained regarding the future of this crop will be realised.

The system of granting premia introduced by Government for growing practically pure crops of cotton in the Ceded districts was abandoned as it was found ineffectual.

Paddy.—The interesting experiments in the direction of single seedling transplantation of paddy carried out at Palur, Samalkota, Taliparamba, Nandyal and in the villages around Hagari have been highly successful. The report describes in considerable detail the work done under this head in pursuance of the orders conveyed in G.O., Mis. No. 918, Revenue, dated 24th March 1910. Closely connected with this question is the observation made by Mr. Sampson, that the free circulation of water is impeded in a thickly-planted crop and that the success of economic planting depends on the free movement of irrigation water with the consequent aeration of the soil. As remarked by the Director, this question is one of great importance and should be investigated as soon as possible.

Green manuring.—Efforts were also made in the year to popularise green manure and active steps are being taken to introduce *Sesbania aculeata*, a plant much used in Bengal for green manuring. This plant, it is reported, enjoys an advantage over sunnhemp in that it will grow on land which is slightly saline. It is moreover thorny and, being unpalatable to cattle, is not liable to destruction by them and seems to be free from attacks by insect pests.

4. *Tobacco.*—Government sanctioned the lease to Mr. T. H. Barry of Cocanada of 14 lankas in the Gôdâvari district at an annual rental of Rs. 8,557 for ten years in order to secure to him the continuous possession of land necessary for experiments in tobacco cultivation. These consist of an attempt to grow wrappers for Indian cigars from Sumatra tobacco grown on the lankas. If Mr. Barry succeeds in his attempts in this direction as he seems likely to do, a new and very profitable industry may be expected to spring up in this Presidency.

5. *Agricultural instruction at the College of Agriculture, Coimbatore.*—Though the full number of students, viz., 20, was admitted each term, the Board regrets to notice that the total number of students at the College of Agriculture at the end of the year was only 32. This result is attributed to the failure of some of the selected students to join the College and to the defection of some of those who had joined, but had left without completing their course. The Board is in correspondence with the Director of Agriculture in order to devise measures to safeguard the College against the vagaries of students. With the help of two outside examiners from Burma and the United Provinces, the second year students numbering 18 were examined for the diploma in the subjects of Botany and Chemistry. An examination was held in Entomology also at the same time. In the result, 12 candidates came out successful. These results are being reported to Government separately. On the whole, the working of the College was satisfactory.

6. *Agricultural Associations and Exhibitions.*—Agricultural exhibitions and cattle shows were held at Ongole, Madura, Kizhur, Kalyandrug, Ellore, Pittapur, Berham-pur and Kottavalasa. Most of the District Agricultural Associations are reported by the Director to have been inactive, but the Board is glad to note that the Associations of Malabar, South Canara and Kumbakonam proved exceptions. The general inactivity is regrettable but it would probably have been less marked had the Central Agricultural Committee been itself less lethargic. The Board awaits with interest the proposal of the Director to reconstitute these Associations on a more practical basis.

7. *Meteorology.*—The rainfall registered at the various rain-gauge stations was tabulated as usual and the results published by the Meteorologist, Madras, and Deputy Director of the Madras Observatory. The total number of stations in the Presidency at the end of the official year 1909-1910 was 477 inclusive of 84 in the Native States or one more than at the end of the previous year and, of these, 378 stations were inspected.

8. *Statistics.*—The following returns were published in connection with local enquiries under provincial direction:—(1) Monthly season reports in three sections, rainfall cultivation and prices of food-grains and salt; (2) annual crop forecast report in respect of cotton, paddy, groundnut, indigo, sugarcane, castors and gingelly and (3) quarterly reports of cattle mortality.

9. *Civil Veterinary Department—The Madras Veterinary College.*—Twelve students graduated in the year, the percentage of successful candidates having been 57 as against 82 in the previous year. The fall in the percentage of passes in the final year class as well as in classes A and B was not unexpected and was due to the inferior quality of the students admitted into the College owing to the paucity of better applicants. Energetic measures were adopted in the course of the year to secure a better class of candidates with the result that the selections made for class A in January 1910 were quite satisfactory. The Board trusts that no efforts will be spared by the Principal and his staff to show better results in future. The construction of a bacteriological laboratory which should afford better facilities for instruction in contagious diseases of animals as well as of a pharmacy has been sanctioned.

10. *Veterinary hospitals.*—There were seventeen hospitals at work at the commencement of the year and five more were opened during the year, making a total of 22. Of these, seven hospitals, namely, those at Madras, Saidapet, Ellore, Rajahmundry, Ongole, Sivaganga and Tinnevely Bridge, were maintained by Government. Nine were maintained by Local Boards, of which the hospital at Tiru-vannâmalai was transferred to Government management towards the close of the year; one was maintained by the Raja of Vizianagaram, two by Native States and two by zamindars, while the hospital at Bellary continued to be maintained by the Society for the Prevention of Cruelty to Animals. The attendance at the Madura and Saidapet hospitals showed no improvement and the figures for the hospitals at Vizianagaram and Bellary also show a slight decrease. The fall in attendance was comparatively large in the Madras Veterinary College and the Ellore hospitals. In the case of the hospital at Madras, the decrease is attributed to the general good health of animals and to the increase in the number of motor vehicles. At all the other hospitals there was an increase in the number of animals treated.

11. *Veterinary Assistants.*—Seven out of the 12 Veterinary graduates who passed out of the Veterinary College in 1909 and one graduate of the Bombay Veterinary College were appointed Veterinary Assistants during the year. The total number of Veterinary Assistants appointed during the year should therefore be 8 and not 7 as reported by the Superintendent. There were four resignations during the period. The work turned out by the practising veterinary staff did not come up to that in the preceding year, only 47,785 head of cattle having been inoculated in the year against 51,087 in 1908-1909. The fall is ascribed to the shortage in the supply of serum from the laboratory at Muktesar and to the fact that, under instructions from the Inspector-General, Civil Veterinary Department, inoculation against certain diseases was either discontinued or suspended. On the Superintendent's own showing, preventive measures of inoculation have resulted in a satisfactory decrease in the mortality of cattle in this Presidency.

The prospects of Veterinary Assistants were much improved during the year, Government having sanctioned the grant of a local allowance as well as of free quarters or house-rent to Assistants in charge of hospitals. Permission has also been accorded to all Veterinary Assistants in the mufassal to undertake private practice.

12. *Pony-breeding operations.*—Government stallions were stationed in the districts of Coimbatore, Salem, Malur and Trichinopoly, and their work showed an improvement on that of the preceding year. There was a large falling off in the number of entires castrated and this result is attributed to the absence of two salustries on leave during portions of the year. Twenty animals were castrated by Veterinary Assistants.

13. *Cattle shows.*—Nine cattle shows were held during the year against seven in the preceding year. The show held at Kalyandrug has not been mentioned by the Superintendent. The shows were on the whole successfully run. They were invaluable from an educational point of view and, in some cases, from a commercial point of view also.

14. *Breeding bulls.*—Eighteen bulls were at work at the commencement of the year. One of these was disposed of by auction as it became unfit for stud purposes. Five out of the remaining 17 bulls were attached to veterinary hospitals and the rest were let loose to graze with herds of cows. Accurate statistics of coverings of the bulls thus let loose could not be obtained, but, as far as could be ascertained, the average number of coverings made by each of them is reported to range from two to ten *per mensem*. Accurate figures regarding the work of the bulls attached to Veterinary Hospitals should have been forthcoming and ought to have been reported.

(True Extract.)

L. D. SWAMIKANNU,
Secretary.

To the Secretary to Government, Revenue Department.
" Director of Agriculture.
" Superintendent, Civil Veterinary Department.
" Principal, Madras Veterinary College.

Order—No. 3298, Revenue, dated 11th October 1910.

Miscellaneous.

Recorded.

2. The report embodies the results of the fourth year's working of the Agricultural Department since its reorganisation. These results are highly satisfactory showing much useful progress in all directions and reflect credit on all the officers of the department.

3. The Coimbatore College was completed during the year under report and was formally opened by His Excellency the Governor on 14th July 1909. No new agricultural stations were opened during the year. The season at all the agricultural stations was, on the whole, favourable except at Nandyal and Bezvada. The Government are glad to observe that the results of the important work on which the department is engaged in the improvement of sugarcane, ground-nut and cotton cultivation continued to be satisfactory, and that successful experiments in the direction of single-seedling transplantation of paddy were carried out at Palur, Samalkota, Taliparamba, Nandyal and in the villages around Hagari. As directed in G.O., No. 918, Revenue, dated 24th March 1910, the Director of Agriculture has taken steps to extend the knowledge of this improved method of planting. It is reported that many cultivators in Tanjore, who have adopted it, have been able to reduce the rate of seed required per acre from 40-50 Madras measures to 3 Madras measures. In view of the very large area under paddy in this Presidency the saving in seed which can be effected by the use of the single-planting method becomes a matter of considerable importance and the Government note with satisfaction that the Director of Agriculture is giving it the attention it demands. The efforts which were made during the year to popularize green manure met with a fair measure of success. The interest of the cultivating ryots in the work carried on at the agricultural stations continued to grow and was shown by an increase in the numbers of visitors to the stations and by the large quantities of seed which were purchased by them. In G.O., No. 1780, Revenue, dated 31st May 1910, the Government have ordered that the Agricultural Calendar which has hitherto been published in English, Tamil and Telugu only should be published in the other vernaculars of the Presidency, and that copies of the calendars should be supplied free of charge to all village officers in the Presidency. It is hoped that this measure will tend to increase still further the interest in the work of the Agricultural Department which the introduction of the calendar has undoubtedly stimulated.

4. The Government regret to note that the Agricultural Associations with the exception of those of Malabar, South Canara and Kumbakonam are reported by the Director to have been inactive during the year. The Associations have done very useful work in the past and the Government trust that the Director will find it possible to formulate a scheme which will enable them to do so in future.

5. The Government are pleased to observe that the working of the Agricultural College, Coimbatore, was on the whole satisfactory and that 12 out of the 18 students examined for the diploma in the subjects of Botany and Chemistry were successful.

6. Twelve students of the Madras Veterinary College graduated during the year, but the percentage of successful candidates was 57 only as against 82 in the previous year. The fall in the percentage of successful candidates is attributed to the inferior quality of the students admitted into the college owing to the paucity of better applicants. The Government trust that the measures which were adopted during the year to secure a better class of candidates will enable more satisfactory results to be obtained in future.

7. During the year under report five new Veterinary dispensaries were opened and the staff of the Veterinary department was strengthened by the appointment of eight Veterinary Assistants. The fall in the number of cattle inoculated from 51,087 in 1908-1909 to 47,785 in the year under review is regrettable, but His Excellency the Governor in Council is pleased to observe that preventive measures of inoculation have been followed by a very marked decrease in the cattle mortality in this Presidency. The subject is one of the utmost importance to the country and, as already ordered in paragraph 7 of G.O., No. 2709, dated 2nd October 1909, must continue to engage the unremitting attention of the Superintendent, Civil Veterinary Department.

8. Nine cattle shows were held during the year against seven in the preceding year. His Excellency the Governor in Council is glad to observe that the Board is of opinion that the shows were on the whole successfully run and that they were invaluable from an educational, and in some cases from a commercial point of view also.

9. The Government agree with the Board of Revenue that accurate figures regarding the work of the breeding bulls attached to Veterinary hospitals should have been reported.

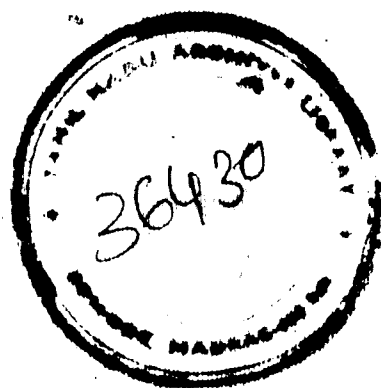
(True Extract.)

A. G. CARDEW,
Secretary to Government.

To the Board of Revenue (Revenue Settlement).

- .. Director of Industries.
- .. Public Department.
- .. Educational Department.
- .. Local and Municipal Department.
- .. Public Works Department (Irrigation).
- .. Inspector-General of Agriculture.
- .. Inspector-General of Civil Veterinary Department.
- .. Minister of Agriculture, Argentine Republic.
- .. Entomologist to the Government of India.
- .. Mycologist do.

Copy to the Government of India, Revenue and Agricultural Department (with C.I.).
Editor's Table.



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