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REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND
RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY.

FOR THE OFFICIAL YEAR

REPORT

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ON THE

OPERATIONS OF THE DEPARTMENT OF LAND
RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

1900-1901.

MADRAS:

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1902.

inspections were made during the year, and the question whether it is necessary or advisable to make any provision for such inspection from a central office is still under the consideration of Government in connection with the proposals for the organization of a special Land Records staff of Deputy Collectors in each district, for supervising the maintenance of survey and other land records.

4. Detailed rules for the one month's and three months' courses for the training of Revenue Inspectors in surveying were, as stated in paragraph 4 of the previous year's report, issued during the year under reference. The final results of the general Survey schools for karnams held in 1899-1900 have not yet been received from the Survey Department, as the Superintendent of Surveys is having the results revalued

Plotting.

Area—computation.

with reference to the efficiency of the karnams in the subjects noted in the margin, a point not noticed when the results were

partially reported in the previous year. The Superintendent of Survey, moreover, did not advocate the holding of annual Survey schools for karnams, and suggested that such karnams as it may, from time to time, be found necessary to instruct in surveying, and also candidates for the post of Revenue Inspectors could be trained by the District Surveyors under the supervision of the Tahsildars and that an examination paper could be set, and the answers valued by the nearest Survey officer. This proposal was accepted as a temporary measure pending the receipt of the Superintendent's report on the final results of Survey schools held in December 1899.

The six Survey divisions in the Presidency was divided for the maintenance of land records and were abolished under the orders of Government from 1st April 1900. District Survey officers hitherto employed on this work were set free for each work, while the District Surveyors were placed directly under the orders of the District Collectors. There were no District Surveyors in the districts noted in the margin as, with the exception

1. Kurnool.
2. Nellore.
3. Madurai.

of Madurai, the District Surveyors were chiefly in examining the karnams' field measurement books and inspecting their work in connection with the measurement of subdivisions, and the examination of boundary marks; and also in attending to demarcation and sub-division in intricate boundary disputes and other cases specially referred to them by Collectors, such as could not be attended to by the Revenue Inspectors. The following abstract shows details of the work done in some districts:—

District.	Number of karnams whose work was inspected.	Number of villages inspected.	Number of fields the plotting of which was tested.	Number of sub-divisions tested in field and in plotting.	Number of missing stones inspected.
1	2	3	4	5	6
Anantapur	75	26	6,184	29	
Chingleput	138	18	2,838	407	11
South Arcot	212	149	26,655	834	14
Trichinopoly	72	93	197	4,843	
Salem	11	14	645	181	
Coimbatore	..	..	39,797	812	
Kistna	..	..	557	..	
Madurai	..	..	1,805	..	
Vizagapatam	87	218	6,718	9,470	
Tanjore	46	46	709	3,283	

5. In the Trichinopoly district, the introduction of the revised scheme of establishments which was to have taken effect from the 1st October 1900 was again off till the 1st July 1901, in view of the inconvenience which, it was expected, result from giving effect to the revision before the completion of the work connected with the census and the jamabandi. In the Kistna district schemes for the village establishments were introduced during the year under review in the taluqs of Sattenapalle, Narasaraopet, Palnad, Guntur, Bapatla, Bezwada and Nandigama.

Madras Act II of 1894 was extended to the larger inam villages in the several districts of the Presidency, and the village establishments in the marginally noted

Nandigama.
Nangum.
Bodagodo.
Talagann.

Kallada.
Pedda Kimedi.
Chinnakimedi.

proprietary estates in the Ganjam district were reorganized, in anticipation of the enfranchisement of the village service inams, the newly appointed village officers

being paid the full salaries sanctioned by Government minus one-twelfth of the assessment of the service inams in their enjoyment.

6. *Examination of Village and Taluk Accounts.*—The village and taluk accounts in all the districts of the Presidency were, as usual, carefully examined at the annual settlement. The Collectors' reports show that the village accounts were maintained in a fairly satisfactory condition. Numerous errors were discovered in several taluks of the Chingleput district, but the Collector states that every endeavour is being made to secure accuracy and completeness in the preparation of these accounts. The village permanent register B, which is an important record of inams, was reported to be deficient in some cases, especially in Ganjam and Godavari, but the Collectors have promised to remedy these defects at an early date. In Kistna, where a temporary establishment was entertained in the previous year for the verification of these registers, the Collector reports that the work was carefully attended to, and he hopes to bring it to a satisfactory conclusion at an early date. The state of the taluk accounts in some districts is reported to be by no means satisfactory. The accounts were not minutely and carefully examined in the Godavari district, and in North Arcot they were found to be carelessly maintained. It is also reported that the maintenance of taluk permanent inam register B. was neglected in the Berhampur taluk of the Ganjam district. Collectors have taken steps to secure the proper maintenance of these accounts and registers.

7. *The use made of the Land Records staff in connection with Famine-relief.*—As observed in the previous report, the distress in Kistna, Nellore and the Deccan districts continued from the beginning of the year till September, when the operations were closed in all the districts, but later on a portion of Cuddapah district gave cause for anxiety which necessitated the opening of relief measures on a small scale. Relief did not extend beyond the test-work stage. The usual duty of the land record staff in collecting information and reporting on the water-supplies, the progress of cultivation, the condition of the standing and the outturn of the harvested crops, and the health of the people and of their cattle, was systematically carried on, and in such a season as that of the year under report, the inspection of the tracts affected received closer attention than usual with a view to questions of the remission or postponement of land revenue. The necessary inquiries into applications for the grant of State loans, both for land improvements and for purchase of fodder also fell on this establishment.

III.—THE UTILIZATION OF LAND RECORDS.

8. *Village Statistical Registers and Firka books.*—Reports regarding the manner in which these records are maintained show that the village registers and firka books have been completely written up and checked up to fasli 1309 in Vizagapatam and Trichinopoly, and almost completed up to that year in Godavari, Kistna, Nellore, Kurnool, Anantapur, Chingleput and North Arcot. But in the four last-mentioned districts, the firka books for several villages have not yet been checked, while in Coimbatore the registers of two villages are said to have been lost, and fresh registers are under preparation. The Collectors report that strict orders have been issued to complete the work without delay. In Madurai, the preparation and checking of these registers for over 220 villages have not been completed for fasli 1308, and an almost equal number of villages has yet to be finished for fasli 1309 also. The Collector reports that in spite of the instructions issued last year, no progress was made in posting these records for inam villages, and this was due, as stated in the previous year's report, to the absence of proper accounts for these villages, and also the inability of the karnams of these villages to prepare the village registers. In consequence, the checking of the firka books for fasli 1308 in the case of 17 villages

has not been finished in Srivilliputtur taluk. In South Arcot, firka books for 234 villages have not been prepared and for 587 villages have not been checked. The Collectors concerned have taken steps to complete the work. In the remaining districts also steps have been taken to bring the records up to date. The progress for fasli 1310 has not been great and the statistics for that year have only quite recently become available after the close of the fasli. In Nellore and Coimbatore alone has any considerable progress been made. In Vizagapatam, the posting and checking of these registers are complete in two taluks while no progress was made in the Palkonda taluk. In Gódvári, Anantapur, Chingleput, South Arcot, Madura and Tinnevely, no progress appears to have been made in the preparation of these registers for this fasli. The following table shows in one view the progress made in the several districts:—

Districts	Number of villages.	[Number of villages for which]							
		Village registers remain to be		Firka books remain to be		Village registers are		Firka books are	
		Prepared.	Checked.	Prepared.	Checked.	Prepared.	Checked.	Prepared.	Checked.
		Up to fasli 1309.				For fasli 1310.			
Gan'ga	1,478	61	61	81	81	299	208	182	..
Vizagapatam	282	..	..	..	..	155	155	155	155
Gódvári	1,341	17	25	36	37	..	..	..	..
Kistna	1,368	2	2	2	2	362	362	161	157
Kurnool	789	9	9	9	191	248	38	202	30
Bellary	962	5	179	14	311	273	117	..	..
Anantapur	740	13	25	27	103	..	..	..	..
Cuddapah	1,354	39	59	51	54	..	..	..	..
Nellore	931	11	11	11	11	600	556	213	30
Chingleput	1,765	6	27	54	75	..	..	..	..
South Arcot	2,700	16	16	234	687	..	..	..	..
North Arcot	1,668	19	24	24	253	688	617	445	216
Salem	3,050	113	113	163	163	273	253	273	253
Coimbatore	1,509	3	3	3	3	1,130	1,020	540	482
Trichinopoly	730	..	..	..	..	434	306	411	202
Tanjore	2,478	..	..	..	..	1,515	834	854	471
Madura	938	213	236	234	249	..	..	..	..
		226	226	229	229	..	..	..	..
Tinnevely	1,081	53	53	61	44	..	..	..	..
		..	..	..	17	..	..	..	..
Nilgiris	48	..	13	13	19	..	..	..	..

* For fasli 1309.

† For faslis previous to 1309.

‡ Incomplete.

IV.—SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL DIRECTION.

9. *Geology*.—From about the close of October to December 1900, Dr. Walker, Assistant Superintendent of the Geological Survey, was engaged in surveying the Nowrangapur taluk of the Jeypore estate in the Vizagapatam district. The results are stated in the general report of the Geological Survey of India.

As the result of a preliminary survey of the more important quartz veins of South and South-East Wynaad, made by Mr. Hayden, it was decided to submit to the mines that had been opened out during the mining activity of the early eighteenth century to a detailed examination with a view to determining once for all, whether with improved appliances and perfected processes of modern gold recovery, there might be any chance for profitable gold mining in this district. Dr. Hatch carried out investigation during the year under review. His conclusion was unfavourable.

10. *Botany*.—Mr. C. A. Barber occupied the post of Government Botanist throughout the year, his head-quarters being at Ootacamund. A report on the work performed by him during the year is appended. In connection with the Botanical Survey of India he visited the Vizagapatam and South Canara districts, and in March visited Calcutta to discuss questions connected with his work with the Director of the Survey. About 1,200 sheets were examined, named and added to the Herbarium. The items of economic work dealt with by the Government Botanist during the year are referred to in part V of this report.

11. The work of collecting specimens of the articles included in the "Programme of collections to be made for the Indian Museum and Imperial Institute" was proceeded with, and specimens of 32 articles were forwarded to the Reporter on Economic Products during the year.

12. *Chemistry*.—The report of Dr. Leather, the Assistant Agricultural Chemist to the Government of India, regarding the work performed by him during the short period he was attached to the College of Agriculture during the year, does not show whether any analytical work was done there.

In connection with the investigation into the causes of the sugarcane disease in Gódvári, the Government Botanist recommended that a series of soil analyses should be made to ascertain whether the soils were wanting in any plant food. The Deputy Director selected 25 samples of such soils, and the detailed results of Dr. Leather's analyses have been published in a bulletin of the department. The general conclusions he arrived at were that many of the soils required manure, both lime and phosphates, besides the ordinary organic manure, and that a good dressing of gypsum would be beneficial to them all, but their chemical composition was not mainly responsible for the outbreak of the disease.

13. *Statistics*.—The subjoined statement shows the statistics furnished to the Government of India and the Imperial officers under the control of that Government:—

Name of report.	To whom sent.
Weekly season report	Government of India (Revenue and Agriculture).
Annual programme of famine-relief works (famine statement C).	
Annual statement of collieries	
Half-yearly statement of wages of agricultural labourers, &c.	Government of India (Finance and Commerce).
Annual statement of minerals	Do. do.
Forecasts of and the reports on the sowings and outturn of gingelly, cotton, indigo, paddy, sugarcane, castor-seeds and groundnuts.	Director-General of Statistics.
Rail-borne Trade and road traffic returns—	
Annual and quarterly	
Agricultural statistics	
Statement of cotton and hemp mills	
Do. of paper and woollen mills	
Statistics of tea, coffee and cinchona cultivation ..	
Fortnightly returns of wholesale and retail prices of certain commodities at selected marts.	

As the agricultural statistics for the year have not yet been compiled, it is not possible to compare the estimates of area framed in the forecasts with the actual areas sown.

14. *Meteorology*.—As in previous years the rainfall registered at the rain-gauge stations was tabulated, and the results published by the Meteorological Reporter to the Government of Madras. The total number of stations in the Presidency is 362 showing an increase of 13 stations during the year. Of the stations no less than 299 were inspected during the year.

15. *Entomology*.—Towards the close of the year an Entomologist was added to the staff of the Imperial Museum, Calcutta, for economic research work with special reference to insects injurious to agriculture, and the Agricultural Department of this Presidency was instructed to communicate direct with him on questions of this nature and to co-operate with him in his investigations.

The Nilgiri Planters' Association having reported that tea and coffee were suffering seriously from black bug and other insect pests, and applied for the assistance of an expert to investigate them, a reference was made to the Entomologist. It was impossible to suggest remedies without local investigation of the insects and the damage done, and that to this end he would be applied for. The subject is under the consideration of the Government.

The damage done by certain beetles to date palms tapped for toddy having been brought to notice, the beetles were sent by the Separate Revenue Department to the Imperial Entomologist and were identified by him as the well-known Palm Weevil (*Rhynchophorus ferrugineus*), and the Rhinoceros beetle (*Oryctes rhinoceros*), and he suggested certain remedies. These were communicated to the Inspectors of the Salt and Abkari Department for guidance.

V.—SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL DIRECTION.

16. Proposals regarding the provision to be made in accordance with the desires of the Government of India for carrying on agricultural enquiry and experimental farms were submitted to Government early in 1899, and towards the end of the year under report Government sanctioned the starting of the two experimental farms as a beginning. The other proposals made were ordered to stand over but have been disposed of recently. One of the two farms is to be opened at Bellary and the other at Koilpatti, in the Tinnevely district. Since the close of the year the land required has been acquired and the opening of these farms is being proceeded with, but the initial stages of organization will require a considerable period. The direct agricultural work of the year therefore was very small, as it has been ever since the Government of India requested that action on the conclusions Government arrived at in 1890 might be held in suspense. The subordinate staff of the department was employed, as it had been in the previous year, and the enquiries regarding the sorghum and sugarcane crops of the Presidency have been completed, and are being prepared for publication. One Inspector was on duty throughout the year in Gódvári in watching the sugarcane crops of the delta, and more especially those planted with Hospet cane. Another was engaged in visiting various cane-growing localities during the first nine months of the year, and later on in making detailed enquiries regarding the cultivation of paddy in several districts. Two were employed at head-quarters during the earlier months partly in connection with relief measures, one was deputed to superintend the fibre experiments alluded to below, and the other was sent out to accompany Mr. Royle on the tour mentioned in paragraph 20 *infra*.

17. *The College Farm and the Botanical Gardens, Sailapet.*—A separate detailed report regarding the working of these has been submitted in the Educational Department by the Principal of the College of Agriculture, under whose control the farm is; the position occupied by the Agricultural Department in relation thereto being only vaguely described. Dairy-farming is the chief item of agricultural work on the farm, but as yet no properly-equipped dairy has been provided. The rainfall was extremely deficient and even the little rain which fell was untimely and badly distributed, in consequence of which all the crops suffered. Further experiments in the cultivation of imported varieties of groundnut were made from the produce obtained in the previous year, but without much success owing to the unfavourable season, and the damage caused by jackals and crows. The produce has, however, been reserved for distribution by the Agricultural Department.

18. *Groundnuts.*—Further reports on the growth of the four varieties of East African seed obtained, and sold to ryots through the Collectors of the chief groundnut-growing districts during 1899, were received about the close of the year under review. Speaking generally, the produce obtained was heavier, matured about a month earlier, was more easily and cheaply harvested, but was more liable to the depredations of vermin, such as crows, jackals, &c., owing to the pods ripening at a smaller depth in the soil, needed a larger supply of moisture and the nuts were more oily and less fit for eating than the indigenous variety. The season conditions under which the experiments were made were, however, unfavourable. Further enquiries as to the results obtained from resowing the seed have, therefore, been ordered.

Seoni wheat.—As stated in paragraph 27 of last year's report, a further supply of Seoni seed-wheat was obtained from the Central Collectors of the Nilgiris and Madura for experimental cultivation. It failed on the Nilgiris, owing to the unfavourable season, but was successful in Madura, where it is known as *Melanantha vulgaris* and *Cockchafer* gr.

that these insects were also damaging the native barley, and that they were one of the greatest pests on the hills. The investigation of these pests has been entrusted to the Government Botanist, who states that the enquiry will take a long time to carry out.

One of the experiments conducted by Mr. Burrows at Lovedale was, however, a success; three pounds of seed having yielded 33 pounds of grain and 135 pounds of straw. A fresh supply of seed has been obtained from the Central Provinces and sent to the Nilgiris for further experiments.

The result of the experiment in Madura was also unsatisfactory. The plants thrived at the beginning but subsequently perished on account of heavy rain.

20. *Sugarcane.*—As stated in paragraph 29 of the previous year's report, owing to the prevalence of disease among the sugarcane in part of the Gódvári delta, a supply of seed-cane was imported from Hospet and sold to certain ryots. The result was a failure. The Hospet cane became badly diseased, apparently contracting the disease after its introduction, but it was not well dealt with by the ryots who purchased it, and the season was remarkable for the phenomenal lowness of the river and bad water-supply during the planting season. Further enquiries as to the state of the local crops showed that they had suffered even more than in previous years from the disease, and in reference to this report Dr. Bourne urged the importance of ascertaining how the disease spreads, and stated that the result of his observations was to show that the commonest medium of infection was the air. The Government Botanist, however, expressed the opinion that the disease was mainly propagated from generation to generation by the selection of unsound seed-cane. A recommendation has therefore been made to Government that it was advisable that the whole question should be threshed out by a committee of scientific and practical officers, with a view to recommending what action should be taken, but no orders have as yet been passed on this suggestion.

In connection with a suggestion made by the Madras Chamber of Commerce, that the department should import immune varieties of sugarcane from other countries, it was pointed out that in all probability the existing stocks comprised a number of varieties, whilst the Government Botanist urged that the existing information on the point of view regarding the different kinds of cane already grown in the Presidency was inadequate. Arrangements were therefore made for the analysis of the different kinds of sugarcane grown in this Presidency, and as the Agricultural Chemist to the Government of India, was unable to undertake the work, the services of Mr. Royle, a chemist employed by the Government, were obtained for a period of two months. He visited the various districts accompanied by an Agricultural Inspector, and analysed 77 samples of cane. The results obtained establish the fact that some of the sugarcanes grown in this Presidency are very valuable varieties.

21. Besides the work referred to in the last two paragraphs, the Government Botanist carried out an investigation into the damage caused by the tea-vel-worm on the Nilgiris. His detailed report on the subject has since been published as a bulletin of the department. He also devoted some time to the investigation of the damage done to date palms by the beetles referred to in paragraph 15 *supra*; but owing to other more pressing work, the field study of the pests was not continued long enough to enable him to make any useful suggestions regarding their treatment.

22. *Sisal hemp.*—In 1898, 3,000 plants of the *Agave Rigida* Var *Sisalana* were obtained from the Madras Agri-Horticultural Society and distributed to the Collectors of Bellary, Anantapur, Salem, North Arcot, Cuddapah, Nellore, Coimbatore and Madura for experimental cultivation. By 1899, almost all the plants in the four last-mentioned districts had died, but most of those planted elsewhere were reported to be thriving. Further reports show that the plants have failed in Bellary and Anantapur also. Such sporadic efforts not being likely to prove of any particular value, it was decided in October 1900 to carry out departmentally an experiment in the growth of this and similar fibre plants on an adequate scale, in a locality where waste land suitable for the plants is available. Such sites were found near Hindupur in the Anantapur district, and the experiment is being conducted under the supervision of an Agricultural Inspector deputed to the work. Hitherto the main work has been to collect as many

a stock as possible for planting out and but slow progress was made during the year under report in this respect; though more success has been attained during the current year.

23. *Durian plants*.—Towards the close of the year, 150 Durian plants were distributed by the Madras Agri-Horticultural Society, at the request of the department, to several officers in Vizagapatam, Coimbatore, Madura, Nilgiris, South Malabar and North Malabar for experimental cultivation. The results will be reported in due course.

24. *The Madras Agri-Horticultural Society*.—The income of the society by the sale of plants, seeds and sundries amounted to Rs. 4,938, while the collections by way of subscriptions from members amounted to Rs. 1,975. A grant of Rs. 4,000 was made to the society by Government as usual. The flower-show held on the 24th February 1901 was, on the whole, a success. An index of the society's library is reported to be in course of preparation. This, when complete, will doubtless be of great service to members and others wishing to use the library.

25. *Veterinary Science*.—The questions whether the Bacteriological Survey, for which the veterinary subordinates in this Presidency had been solely retained, should be continued; how the establishment might be otherwise employed; or whether it should be dispensed with, as well as other matters connected with the working of this branch of the department were discussed with the Inspector-General, Civil Veterinary Department, in December 1899, and as the outcome of this discussion, proposals for a reorganization were made early in 1900, on which the orders of Government were received in October 1900. They have not as yet been given effect to owing to the Superintendent, Civil Veterinary Department, having reported that he is unable to nominate competent trained men to fill the posts newly sanctioned by Government; nor have the Stock Inspectors, whom it was decided to dispense with, been brought under reduction. They have since been employed in collecting such information as the Superintendent may require, whilst the notice of discharge issued to four of them has been held in suspense in deference to his representations. The question whether it is not possible to find competent upper subordinates is still under consideration.

The inoculation of 60 cattle against rinderpest with serum prepared in laboratory was carried out at Atmakuru, Kurnool district, during the year, though several outbreaks of this disease were reported from other districts. Stock Inspectors were deputed to ascertain whether the extent of the disease and the attitude of the ryots afforded an opportunity for carrying out inoculation, it was generally found that the disease was subsiding by the time it arrived, or that the ryots were unwilling to allow their cattle to be inoculated. The Superintendent has, however, been requested to carry out further inoculations wherever possible.

The proposals made by the Inspector-General of the Civil Veterinary Department for the establishment of a Veterinary College in this Presidency fell through, as it was considered that the demand for such an institution was not sufficient to justify the establishment, and that the work of teaching in connection therewith would interfere very seriously with the more important duties of the Superintendent in the management of the department.

The establishment of a few veterinary dispensaries at carefully selected centres was sanctioned, but the scheme is held in abeyance pending the selection of properly trained men.

26. *Pony and Mule breeding operations*.—One pony stallion was cast in June 1900 and fourteen remained at work during the year: nine in Coimbatore, four in Salem and one in Madura. One of those in Coimbatore was entrusted to the Pattagar of Palayakottai from June 1900. The average number of coverings per stallion was 32 in Coimbatore, and 21 in Salem, as against 39 and 20 respectively in the previous year. The chief reasons assigned by the Superintendent, Civil Veterinary Department, for the small number of coverings were, that care was taken to allow only mares in good condition and those in season to be covered; bad season; and the prevalence of plague and cholera in parts.

Of the 349 mares covered during the previous year in Coimbatore, 13 mares were not covered and the results in the case of 25 mares were not ascertained; of the remaining

311, 79 foaled, 27 aborted, and 205, or 66 per cent. of the covered mares traced, proved empty. In Salem, out of 98 mares covered, 2 died and the results of 22 were unknown; of the remaining 74, 15 foaled, 1 aborted, and 58 mares, or 78 per cent. of the known results, were empty. The percentage of produce foaled to mares covered was 21.6 in Coimbatore and 15.3 in Salem as against 16.0 and 11.0 in the previous year.

Four donkey stallions continued at work—one at Kollegal, another at Hosur and a third at Dharmapuri. The fourth was at Krishnagiri till October 1900, and was lent to Mr. Blake, of the Devanahalli mule-breeding farm in Mysore, in November 1900. The total number of coverings effected during the year was only 93 against 116 in the previous year. Of the previous year's coverings, 89 per cent. were unsuccessful.

The results of pony-breeding operations have not so far been satisfactory and the question of continuing them came up for consideration, but in deference to expert opinion it has been resolved to persevere in them under certain revised arrangements, and the scheme for increasing the present staff of salustries, referred to in paragraph 32 of last year's report, has recently been sanctioned by Government.

In Coimbatore, 47 entires were castrated as against 56 in the previous year. In Salem, 127 entires were castrated as against 121 in the previous year.

No pony-shows were held during the year owing to the existence of plague.

27. The Cattle Disease Act (Act II of 1866) was put into force at 20 places during the year in connection with large cattle fairs, at each of which a Stock Inspector was present to assist the Revenue officers in carrying out the provisions of the Act and to treat cases of disease.

In January last, the Superintendent of the Civil Veterinary Department reported that glanders and farcy prevailed on the transit lines in the Dindigul division of the Madura district, the Glanders and Farcy Act was introduced into sub-tract and continues in force. Twenty-five affected ponies were destroyed before that close of the year under report. The disease appears to be more widespread than anticipated.

28. *Statistics*.—The following returns were published in connection with local inquiries under provincial direction:—

(1) Report on the operations of the establishments for stamping weights and measures—submitted to Government, Revenue Department, on 1st July.

(2) Comparative statement of irrigation and rainfall—forwarded to the Chief Engineer for Irrigation, in October.

(3) Statement of quantity and value of crops irrigated under major (productive) works and minor works for which capital and revenue accounts are kept.

(4) Triennial report on the subject of agricultural wages, embodied in the Land Revenue administration report—submitted to Government in March.

(5) Season reports in three sections (rainfall, cultivation and prices of food-grains and salt)—monthly.

(6) Quarterly and annual reports of cattle mortality.

VI.—AGRICULTURAL EDUCATION.

29. Recommendations submitted to Government in February 1899 on the method by which effect might be given to the principles laid down by the Government of India in 1897 as to the reform in primary education, the improvement of readers, the preparation of text-books, and the training of teachers so as to provide men competent to give instruction in elementary agriculture, remained under the consideration of Government during the year. In February last Sir E. Buck visited the Presidency on behalf of the Government of India and had an interview with the present Director on the subject. He made enquiries as to what had been done in the matter of giving instruction in elementary agriculture, and was informed that the proposals made in 1899 regarding the extension of agricultural education were under the consideration of Government, and that under the Madras Educational Rules, 1

"elements of agriculture" formed one of the *optional* subjects in Primary and Lower Secondary schools. He was inclined to think that the subject should be made compulsory. He also suggested that the minors under the Court of Wards might be given some instruction in agriculture, and that something might be done by the Court towards introducing improved methods of agriculture in estates under its management. This suggestion is under the consideration of the Court.

30. *Higher Education.*—The College of Agriculture is administered by the Educational department in consultation with the Director of Agriculture on all matters of importance. The number of students in the college showed a small decrease, the falling off occurring amongst those from outside the Presidency. No changes were made during the year in the college course, but the time which the Agricultural Chemist can now devote to work at the College has been reduced to six weeks. During this period he delivered 24 lectures to class III on soils, feeding-stuffs and milk, in addition to 19 hours' practical work, and 19 lectures to class III on organic chemistry, in addition to 8½ hours' practical work. These extremely short courses which are now alone possible are entirely inadequate, and were the more so, as the Principal who lectures on general chemistry was absent on leave during the whole year.

The usual special course of lectures on Veterinary matters was delivered by the Superintendent, Civil Veterinary Department, between 4th October and 15th November. Twelve lectures and ten practical demonstrations at the Veterinary hospital were given to class III, besides 11 lectures to the second class, covering 18 hours. The Superintendent also visited the hospital on 15 other occasions. He reported that the students worked satisfactorily in the practical demonstrations, and showed that the skill in handling animals, dressing wounds and performing other minor operations. The Veterinary hospital continued to increase in popularity, and the number of cases treated has been steadily rising from 380 in 1895-96 to 804 in 1899-1900 and 856 in 1900-1901.

Owing to the unfavourable character of the season, the opportunities of the students for practical farm work were considerably curtailed, but the whole question of how the course in the college can be improved was under discussion by a committee appointed by the Director of Public Instruction, which has since reported. The results of the examinations held in April last were more satisfactory than in previous years.

VII.—THE PUBLICATION OF AGRICULTURAL INFORMATION.

31. During the year under report the following bulletins were published by the Department:—

No. 39. The "Sugarcane in the South Arcot district" by Mr. C. A. Barber, the Government Botanist.

No. 40. The "Seed-drill" and other implements used in connection therewith, being notes and remarks thereon, by Mr. C. Benson, and with an historical note on the Bamboo drill by M.R.Ry. C. K. Subba Rau Avargal, Sub-Assistant Director of Agriculture.

No. 41. The "Ground-nut crop": A report on certain analyses of the ground-nut by Dr. J. W. Leather, Assistant Agricultural Chemist to the Government of India, and notes on some experiments made thereon by Mr. C. Benson.

No. 42. "Native beliefs regarding the hairmarks on horses and cattle" by Veterinary Lieutenant J. D. E. Holmes, Superintendent, Civil Veterinary Department.

No. 43. "Sugarcane in the Gódvári and Ganjam districts." A collection of papers by Mr. C. A. Barber, Government Botanist, Doctor J. W. Leather, Assistant Agricultural Chemist, and M.R.Ry. C. K. Subba Rau Avargal, Sub-Assistant Director of Agriculture.

No. 44. "Notes on the cattle of the Madras Presidency" by Veterinary Lieutenant J. D. E. Holmes, Superintendent, Civil Veterinary Department.

A Monograph on the "Ivory-carving industry of the Southern India" was prepared by Mr. Thurston, Superintendent, Central Museum, during the year, but was published soon after its close. The Government of India has decided not to call any industrial monograph during the current year.

32. The number of papers received from, and communicated to other Provincial departments was as follows:—

Subject.	Received.										Sent.					
	Reports.		Books.		Pamphlets.		Journals.		Other papers.		Total.		Reports.	Pamphlets.	Other papers.	Total.
	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.						
Agriculture	15	8	1	18	26	211	71	83	..	1	113	321	..	6	..	6
Statistics. { Crop ..	..	..	5	..	..	..	..	..	..	..	5	..	..	..	17	17
{ Trade ..	..	..	..	..	..	..	..	4	..	..	..	4	5	..	..	5
Forest	15	..	2	..	1	..	12	..	..	..	30	..	..	..	..	..
Arts and Industries ..	..	..	..	..	3	..	51	..	..	..	54	..	..	1	..	1
Botany	2	..	..	2	..	..	..	..	..	..	2	2	..	..	..	..
Entomology	..	..	3	2	3	..	..	..	..	..	6	2	..	..	..	..
Geology and minerals ..	6	..	2	..	..	..	..	..	..	..	8	..	..	..	..	..
Meteorology	19	..	1	..	10	..	..	..	..	..	30	..	..	..	..	..
Live-stock	37	..	..	..	..	..	..	..	..	..	37	..	..	..	..	..
Veterinary science ..	9	..	..	..	..	..	..	..	..	..	9	..	..	..	..	..
Total	103	8	14	22	43	211	134	87	..	1	294	329	5	7	17	29

APPENDIX.

Annual Report of Mr. C. A. BARBER, Government Botanist.

I have the honour to forward the following annual report of the work done by the department. The period included is from 1st April 1900 to 31st March 1901.

2. The following were my movements:—

The first half of April was spent at Head office and devoted to routine clerical work. Several visits were also paid to the Dodabetta Cinchona plantations.

Immediately after the Easter holidays I proceeded to Waltair (which I reached on 22nd April) to collect over the Vizagapatam forests. Under the circumstances detailed in my last report, much as I would have liked it, I was quite unable to attempt the more enticing higher Agency tracts, but, because of the condition of my staff, I had to confine myself to the lower, hot hills of the Gólgonda taluk. From the specimens obtained, however, I do not think that these parts have been collected over before.

I visited the following places in the Vizagapatam district:—

Pollavaram on the sea coast (26th to 30th April).

Ragupalem, in the dry scrub forest near the railway (2nd to 10th May).

Karaka, on the fine slopes of Karakakonda (12th to 31st May).

Krishnadevipeta, just within the Agency tracts (22nd May to 2nd June).

Nathavaram (2nd to 12th June).

Krishnapuram, again within the Agency (10th to 18th June).

After this I devoted myself to the study of date-palms and examined them wherever I could on my return eastwards. They were inspected at Lakshnipuram, near Narasapatnam, Makarapalem and around Anakapille and Kondakerla.

I reached Ootacamund on 4th July. During the next three months, with one short interval, I remained at head-quarters. The monsoon was an extremely long continued one and touring on the west coast was not to be thought of. The short visit to Devala, referred to below, was during continuous, heavy rain.

This period at Head office was, however, not so productive of good work as could be wished. My staff was, for the first six weeks, almost continuously absent owing to fever contracted during the Vizagapatam tour, and the writer was practically absent from his duties during the whole of this period. He finally left the office through ill-health and my new clerk did not join until the eve of my departure for South Canara.

Under these circumstances, a good deal of clerical work fell to my lot.

An attempt was, however, made to grapple with the naming of specimens collected and the general lines of work were for the first time settled with my assistant. Important work of an economic nature during this period was the examination of spe tea-seedlings from Devala which had been attacked by a root eel-worm.

For this purpose also a short visit was paid to the infected estate (30th August to 7th September). A few orchids were collected which were new to the collection, the tea estate was inspected and visits were paid *en route* to the Nadavattam Cinchona plantation and one Nilgiri tea estate.

On 5th October I left Head office for a tour in the South Canara forests. The following places were visited :—

Sullia (25th October to 5th November).

Sampagi, at the foot of the Mercara ghaut (5th to 16th November). During my stay at Sampagi, I proceeded on 11th November up the ghaut to Mercara, and on 12th November I collected specimens for the first 18 miles down towards the Coorg boundary. A number (over 100) of interesting plants were found during this little trip.

Jahlsur (16th to 22nd November).

Beltangadi (24th to 29th November).

I reached Ootacamund on 8th December. The remainder of the month was taken in arranging my collections and working up office arrears.

During the Christmas holidays I had the pleasure to entertain Mr. Willis, the Director of the Ceylon Botanical Department. As his object was the same as my own, the exploration of the South Indian Flora, I accompanied him on a short tour to Pykara to examine the river flora there.

I remained at Head-quarters from 9th December till 26th January.

During this time I was without the help of my assistant, Mr. K. Hanumantha Row, who desired to present himself for the M.A. examination in Botany in Madras. At the end of the month, however, instead of returning to his duties, he sent in his resignation in an entirely unexpected manner, thus placing the department in a very awkward position on the eve of my next long tour.

I prepared in January a long memorandum upon the work of the office, a report on the tea-eel-worm disease at Devala and a shorter one on an infestation of white grub which has been known for many years in the Nilgiris.

I left Ootacamund on 26th January and remained in Madras till February 6th, engaged among other things in examining candidates for the post of assistant.

I then proceeded to the Gôdâvari district and spent from 7th to 28th February in the examination of the sugarcane fields.

I visited the following places :—

Tapeswaram, Mandapeta, Pasalapudi, Vulapalle, Pandalapaku, Tossipudi, Komaripalem, Koppavaram and Biccavol in the Râmachandrapuram taluk; Mondapulanka, Nagadulanka, Tatipaka, Razole and Sivakodu in the Narasapur taluk; Peddabrahmadeva, Medapadu and Bhinavaram in the Cocanada taluk; and Ragampeta, Vadlamuru, Pulimeru and Gudivada in the Peddapuram taluk.

On 28th February I proceeded to Calcutta by train and remained there until 18th March. In Calcutta I spent most of my time with the Director of the Survey at the Royal Botanic Gardens, Sibpur. I also spent several days with the Reporter on Economic Products and called upon the Entomologist to the Government of India.

I reached Ootacamund on 27th March, and then had the pleasure of receiving visits from Dr. Stuhlman, the Director of Agriculture in German East Africa, and Mr. Augustine Henry, the pioneer botanical explorer in Central China.

3. The collections made during the past year were again large. Part of them were noticed in my last year's report. The districts may be divided up as follows :—

(a) Evergreen forests, South Canara, Mercara, Wynaad.

(b) Mixed forests, Vizagapatam district.

(c) Sea-side flora, Pollavaram (Vizagapatam).

(d) River flora of Podostemonaceae, Beltangadi, Sullia, Sampagi in South Canara, and Pykara on the Nilgiris.

It is difficult to speak of the character of the collections because they are far from being thoroughly studied yet.

The West Coast was visited for the first time, and it is quite evident, from the collections made, that a series of visits down the entire length of the western ghats will be of advantage. The portion examined during the South Canara tour was the Mangalore-Mercara road, and in this district further visits should be paid to the portions north and south of this tract where the flora evidently differs a good deal. Both the north and the south portions of South Canara near the hills seem to be little known and have certainly not been visited by botanists frequently, if at all.

During the South Canara tour a good deal of attention was devoted to the curious little group of Podostemonaceae. These plants, like mosses and lichens in appearance, are in degraded forms of higher plants, the body of the plant simulating the lowest forms in the kingdom, but minute flowers, consisting of one stamen and one ovary each, indicating a taxonomic position. The relationship of the Order among the higher plants has not been ascertained, and the collections from South Indian rivers, one of their principal habitats, are very meagre.

My attention was specially drawn to the group by Mr. Willis, who has just continued down the Western ghats in search of material for a monograph which he is preparing. He found the river at Sullia full of three species, and again at Beltangadi there was such a mass of interesting specimens that I devoted myself to the river-bed during the whole of my stay there. The result has exceeded expectations, and a very interesting series of specimens has been handed over to Mr. Willis for determination. Curious transitional forms were found, which will necessitate an alteration of the classification, and some of the species are new to science.

During the Christmas holidays the short tour to Pykara in Mr. Willis's company was devoted to the same group.

The tour in Vizagapatam was also interesting in its way, although the time of year, May to June, was hardly the most desirable to explore this hot region. From the plants collected it is at once evident that the parts nearer the hills had not been previously visited. Some of the species described as extremely rare in Hooker's Flora, and not represented in the later collections of the Madras and Calcutta herbaria, were found in great abundance.

During the short tour in the Wynaad in September, while examining the tea-eel-worm disease, a few road-side orchids were collected. Several of these appear to be new to South India and one at least is a new species.

These facts will sufficiently show that there is plenty of work to be done in various parts of the Peninsula. To leave the more distant places out of consideration, the results from the neighbourhood of Devala, not more than 40 miles from Ootacamund, indicate that this tract is by no means worked out, and during the year a new species of orchid has been found abundantly in the neighbourhood of Ootacamund itself.

4. In my last report the accumulation of arrears in naming the plants collected was adverted to. Since that time a change has been made in the distribution of the Government Botanist's time in the field and at head-quarters. Instead of four months at Ootacamund a stay of six months has been sanctioned. One tour in each year will presumably be devoted to economic work and there will thus be a smaller accumulation of plants to be looked through, in that fewer plants will be collected during the year.

It will be evident that during the past year there were unusual difficulties caused by the sickness and absence of the clerk and more especially by the unexpected resignation of the assistant. But a serious effort was made in August and September to put the past collections in order. About 1,200 sheets were examined, named and added to the Herbarium.

It has not however been possible to devote more time than this to the purely systematic work while at head-quarters.

In spite of the Government Order sanctioning the longer stay at Ootacamund, considerably the greater portion of the working year was spent in the field. An attempt will be made in the current year to remedy this state of affairs, but it will not be easy. So much time is taken up in getting to and returning from the centres of collection, especially on the west coast, that the two months provided for each tour are hardly sufficient, and this is especially felt when, as is frequently the case, matters of routine or questions of economic interest have also to be attended to.

It thus remains to be determined whether three principal tours will be possible each year, unless one of these is carried out, in part at least, by an assistant. At present, however, the assistants are hardly fit to be entrusted with such work.

5. The strength of the staff remained the same as last year, but, as already explained, the department was frequently short-handed when the Government Botanist was at head-quarters.

In February 1901, Mr. Venkata Krishnama Nayudu, M.A., of the Madras University, joined as Assistant in place of Mr. K. Hanumantha Row, B.A., resigned.

The new year will open with two assistants at Head office instead of one, and a considerable increase in the usefulness of the department may be confidently expected. It must be borne in mind, however, that these will have to be trained, and that a couple of years must elapse before they will be of much service in the more responsible work of naming plants. After two years of training the late assistant was entrusted with certain portions of the work, such as making a preliminary study of the field collections and naming the orchids and grasses. It will require a proportional period of time before the new assistants can be entrusted with this work, and, for the present, with the necessary training that they will require, the Government Botanist's hands will be rather fuller than before.

6. As reported last year a request was forwarded from the Government Botanist that he might be allowed, like the Government Botanist of the North-Western Provinces, to pay a visit to Calcutta for consultation with the Director of the Survey of India. This was granted by the Government and the visit took place during March 1901.

One hundred and seventy specimens were taken to be named. These did not include all plants about which doubt was felt or which local material was insufficient to determine, but those set apart during the earlier tours alone. Of them 101 were worked through and brought back to Ootacamund. About four new species were noted and the Grewias, so a feature of our mixed forests, were subjected to a careful analysis.

Great deal of useful information was gathered in conversation with the Director, whose aid was sought on many matters which had arisen since the Government Botanist had taken Mr. Lawson's duties.

A careful study of the mode of working and the requirements of the Reporter on Economic Products was made, as far as they referred to economic botany, and every facility was placed in the way of the Government Botanist to make use of the files and specimens collected in the Calcutta office and museum. In questions of difficulty it has been arranged that the files on particular subjects may be sent down to the office of the Government Botanist, and thus the stores of information accumulated in the office of the Reporter on Economic Products will be available for this Presidency, without the necessity of sending a series of enquiries to be dealt with at a distance and without full knowledge of local conditions. In return the Government Botanist has agreed to assist in the collection of specimens and photographs of the more important trees which have their habitat in this Presidency.

Altogether the amount of assistance obtained during the short visit to Calcutta was so great that an early opportunity will be sought to repeat the visit and deal with another batch of doubtful and interesting plants, and also, if time permit, to work up any of the pests among South Indian plants concerning which there is insufficient information in the Presidency. The cold-weather tour will frequently be in the northern part of the Peninsula, and since the Government Botanist is then nearer to Calcutta than to Madras there would appear to be less difficulty in his making the visit at that time of year.

7. A good deal of attention has been given during the past year to grasses. A collection has been forwarded to the United States Government Agrostologist in exchange for those received from him last year.

As the result of correspondence with the Government Botanist of New South Wales a set of grasses is expected from him, and a series of exchanges will be entered into.

The attention of the Government Botanist has been directed to the question of grasses and fodder plants in the Madras Presidency, and a list has been commenced at the instance of the Forest Department. This work has been definitely postponed for the present by the change of assistants, since the naming of grasses was part of Mr. Hanumantha Row's special work. It will however be taken up again as soon as the new second assistant is able to devote himself to it.

The invitation of the Government Botanist to Forest-officers to send up special collections of interesting forest plants has met with some recognition during the year.

Three sets of grasses were sent by the District Forest-officer of Coimbatore and the names forwarded to him.

Two parcels were received from the Conservator of Forests, Northern Circle, and one from the District Forest-officer, Vizagapatam. These have not yet been attended to but will occupy the second assistant's attention immediately.

8. Various requests for specimens have been received from scientific men in other parts of the world.

Enquiries have been received by specialists in Germany for South Indian Myrsineae and Cariceae.

Podostemonaceae are being collected for special monographic purposes.

Requests have been received for South Indian Hepaticae, Ebenaceae and parasitic plants.

The Reporter on Economic Products requires specimens of timbers of foliage and photographs for his museum in Calcutta, and various other enquiries have been received.

It will be obvious that, for the department to be useful in the true sense of the word, it is advisable to endeavour, as far as possible, to meet with these requests, and an attempt is made to do so. On the other hand, it will be equally obvious that no special expeditions are undertaken excepting for Government work, and the particular specimens referred to can only be collected during the ordinary tours. The Government Botanist is however still practically single-handed and work of this nature will be slow.

9. I now turn to the economic work accomplished during the year. Among the most important enquiries are the following:—

Sugarcane disease.—With the exception of an examination of canes sent from Chendragiri the attention of the Government Botanist has been entirely directed to the Gódvári fields. A tour was arranged in February for the purpose of a thorough investigation, and the result will be submitted in a separate report.

The industry is reported to be in a deplorable condition and the time has arrived for definite remedial action to be taken. During the year some canes imported from the Hospet district have been grown by the ryots, but the results have not been satisfactory. The only direction in which Government can usefully intervene is in the establishment of a small experiment station, the primary object of the introduction of healthy plant cane, but where it will be well for trials to be made with the view of improving the agriculture of the district. The practice is not suited in all cases to a better class cane and there are a number of points in

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