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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

G.O. No. 584 Press

~~B.P. No.~~ ~~Mis.~~

Dated 11th May 1874 196 .

Not to be folded or roughly handled

Read the following papers :—

No. 131. From J. GEOGHEGAN, Esq., Under-Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, (Surveys,) to the Chief Secretary to the Government of Madras dated Calcutta, 13th May 1872, No. 301 :—

I AM directed to acknowledge the receipt of your letters, Nos. 1,728 and 329, dated, respectively, the 3rd October 1871 and 22nd February 1872, on the question of strengthening the present Survey Establishments in Madras, with a view to the speedier attainment of continuous geographical materials.

2. But before sanctioning any additional expenditure on this account, the Governor-General in Council desires to receive from the Government of Madras a complete account of the Survey Establishments of the Southern Presidency in much fuller detail than the papers now before His Excellency in Council afford material for. The account should show the strength and cost of the establishments which first took the field, the successive increases sanctioned (if any), the work performed, and the total financial result.

3. In connection with this subject, I am to commend to the consideration of His Excellency the Governor in Council the following points :—

(*a.*) The topographical survey of cultivated tracts interspersed amidst ryotwari land has in Madras been conducted on the scale of 4 inches to the mile. In Northern India, such a scale has only been found necessary for the definition of village boundaries. Where these are not laid down a scale of 1 inch to the mile has been found sufficient. It should be considered whether the delineation of village boundaries in such tracts is necessary, and, if it is not so, whether the scale of survey might not be reduced.

(*b.*) Uncultivable tracts are topographically surveyed on the scale of 2 inches to the mile. It appears to the Governor-General in Council very doubtful whether the value of a survey of such ground on such a scale can at all justify the expenditure involved. In Northern India, the scale of survey in such cases has never exceeded one mile to the inch.

(*c.*) The disproportion between the numbers of European and Native officers in the composition of the two parties proposed by Colonel Priestley is very marked. For the two topographical parties he asks permission to entertain six European officers and sixty-two Natives, surveyors and draughtsmen. It has been found quite impossible in the Bengal Presidency to ensure a correct delineation of *ground or*

difficult hilly country by means of establishments thus organized. Indeed, the number of Native employés proposed by Colonel Priestley for two parties is equal to the total number of European and Native officers of the same classes in the whole seven topographical survey parties under the control of the Surveyor-General of India.

4. But apart from the question of the constitution of the survey parties and the scale or scales on which the survey should be conducted, the Governor-General in Council thinks that some further explanation is necessary as to why a survey which has completed upwards of 34,000 square miles of country should have produced so little geographical material. The figures given by the Government of Madras are insufficient to explain this; for they do not show the proportion of revenue full-scale survey to the surveys on the lesser scales, either actually accomplished or remaining to be taken up. Before sanctioning an addition to the existing strength of the survey, the Governor-General in Council would wish to be assured that the same object could not be attained by a re-distribution of the work. For a judgment upon this point data are, however, altogether wanting.

5. A part of the proposition before the Government of India is the entertainment of an establishment of compilers and draughtsmen, costing Rs. 13,056 per annum. The sum is not large, but the Governor-General in Council is not sure whether Colonel Priestley has fully apprehended the way in which it is desired to utilize the results of the survey for geographical purposes. The establishment includes a *lithographic* branch. But what is really needed for geographical purposes is not *lithographed maps* but *manuscript* materials, with the necessary mathematical data for the scale of four miles to the inch. It appears to the Governor-General in Council, as at present informed, a subject for regret that the preparation of such materials should have been allowed to fall into arrear instead of being carried on, as in Northern India, *pari passu* with the survey.

6. To sum up, the Government of India before deciding whether an extra establishment is necessary desires full information as to the past and present constitution of the Madras survey, and the work it has hitherto achieved in each class of survey, and the work still remaining to be done; and, further, to be placed in a position to judge whether by reduction of the present scales of topographical survey, by a change in the constitution of parties, by a re-distribution of the revenue and topographical branches, or in any other way it may not be possible, without interfering with the main object of the survey, to promote the collection of geographical materials at a somewhat more rapid rate than has hitherto been the case. I am, therefore, to commend the whole subject to the careful consideration of His Excellency the Governor in Council.

REFERRED to the Superintendent of Revenue Survey for his remarks to be submitted to Government, through the Director of Revenue Settlement and Board of Revenue, in view to their remarks being added on any proposals which Colonel Priestley may make.

(Signed) W. HUDLESTON,
Secretary to Government, R.D.

20th May 1872.

No. 135. Proceedings of the Board of Revenue, dated 2nd September 1874, No. 1,729.

Read the following letters :—

From Colonel F. J. B. PRIESTLEY, Superintendent of Revenue Survey, to J. GROSE, Esq., Secretary to the Board of Revenue, dated Chepauk, 4th June 1873, No. 1,316-58.

REFERRING to the orders of Government as per margin, and to the Proceedings Board of Revenue, No. 1,323 of the 27th March 1871, I have the honour to submit, for transmission to Government, with such remarks as the Board may wish to offer, four copies of a report on the constitution and work of the Revenue Survey Department up to 31st December 1872.

Dated 28th June 1870, No. 958.
" 28th February 1873, No. 238.

2. The submission of this report has been delayed up to date, in the hope that the tables enumerated in the accompanying list might be forwarded with it; but, as full information especially of assessed areas and minor fields is not yet available, I have thought it undesirable to delay the report any longer.

3. Four copies of each of the tables will be forwarded as they are completed.

4. I enclose copy of a letter from the Secretary to the Government of India, Department of Agriculture, etc., referred to in G. O., No. 238, of 28th February 1873.

No. 301 of 13th May 1872.

5. The Director Revenue Settlement has been furnished with two copies of this report which he has been requested to submit to the Board with his remarks.

ENCLOSURE No. 1.

AN ACCOUNT OF THE MADRAS REVENUE SURVEY ESTABLISHMENTS, OF THE WORK PERFORMED BY THEM, AND OF THEIR PRESENT OPERATIONS, SUBMITTED IN OBEDIENCE TO G. O., DATED 20TH MAY 1872.

1. INTRODUCTION.—In 1853, the only maps of the Presidency in existence were those prepared by the Military Institution from which the sheets of the Atlas of India had been compiled, and maps of individual Collectorates on a small scale. A Revenue Survey had not been attempted. In almost every part of the Presidency, there had been a Paimash or recorded measurement by pole which, in official records, was often called a survey. The Paimash or Survey varied, in accuracy, in different districts. It had, in no district, been conducted on European principles of surveying, nor had, in any case, maps been prepared showing the position and extent of the land measured.

2. In some district, the Paimash had become almost totally useless. In every case, the Revenue authorities were completely at the mercy of the Curnam, who interpreted the Paimash records as he thought fit.

3. A measurement through the centre of a field from north to south, and another through the centre from east to west, together with the numbers of adjoining fields, were the only records by which any particular plot of land could be identified.

4. For many years, a Revenue Survey had been in progress in the Bombay Presidency. A Revenue Survey had been carried on in the North-West Provinces and in Bengal.

5. The principles on which the surveys abovementioned had been conducted did not appear suited to the peculiar circumstances of this Presidency. In the North-West and in the Bengal Presidency, the accuracy of measurements of individual fields seemed not to be sufficiently considered. In Bombay, the importance of making a Revenue Survey useful for geographical purposes appeared to have been lost sight of.

6. EXPERIMENTAL SURVEY.—The services of Captain Priestley of the 25th K. O. B. were, in the year 1853, placed at the disposal of the Revenue Board in view to his training a Survey Class, and submitting, for the approval of the Board and Government, maps of villages surveyed under certain conditions laid down by them. Surveyors were so scarce that the only persons who had any knowledge of surveying, and who were available, were a superannuated Plane Table Surveyor, formerly in the Topographical Survey Department, and a young Ordnance Artificer trained in the school of that department. Captain Priestley commenced work in the South Arcot District. After the survey of several villages had been completed, the maps and records were sent for the inspection of the Revenue Board.

		Rs.	A.	P.
1	Captain F. J. B. Priestley ...	200	0	0
1	Mr. McMahon, Surveyor ...	235	10	0
1	Mr. Starr, Superintendent ...	50	0	0
14	Karcoons at 17½ Rs. each ...	245	0	0
14	Do at 12 Rs. „ ...	168	0	0
2	Writers at 12 Rs. „ ...	24	0	0
1	Plan Drawer at 17½ Rs. }			
1	Do. at 12 Rs. } ...	29	8	0
1	Goomastah	15	0	0
1	Duffadar or Head Peon	6	0	0
12	Peons at 4 Rs. each	48	0	0
	Total...	1,051	2	0

7. With the exception of Captain Priestley's proposal to connect his work with the Great Trigonometrical Survey, and of some arrangements he had been compelled to adopt for want of suitable* instruments and establishment, the system on which he had been working was approved by the Board and may be briefly described as follows:—

I. *Selections from the Records of the Madras Government, No. IX.*—To have the village boundaries of a taluq marked out by the Revenue authorities and permanent pillars of masonry erected at each Theodolite station.

II. To lay out grand circuits of 50 or 100 square miles and survey the boundaries of villages and sub-divisions of villages within them by Theodolite and chain, ascertain the true bearing of lines at intervals by observation, plot on the scale of five chains = 1 inch and compute the content (in acres) of the village and subdivisions by traverse. Plot the fields (of two acres and upwards) measured by chain within the boundaries of villages and their sub-divisions.

III. The test of the correctness of field measurements was their plotting exactly into the boundary laid down beforehand; of field areas, their gross content equalling the area by traverse.

* NOTE.—The largest instrument in Captain Priestley's possession was a five inch Theodolite. He was provided with *brass* chains made at the Gun Carriage Department for traversing, and bamboo poles of twenty-four feet for field measurement.

IV. The Topographical details and such parcels of land as did not admit of Khusreh or detailed field measurement by chain alone to be laid in by chain and compass, the expense of Topographical survey being merged into that of the Khusreh.

8. This system with slight modifications and improvements has continued to the present day.

9. *Selections from the Records of the Madras Government, No. LIII.*—The Deputy Surveyor-General in a letter to the Government of India, reviewing the tentative operations in South Arcot during 1853 and 1854 reported on in Selections from the records of Madras Government, No. IX., points out the necessity of connecting any survey in Madras with the great Trigonometrical Survey Stations, of working on a true meridian, of making provision for a topographical survey of such lands as are not included in the fieldwar survey; and remarks the total absence of any establishment or machinery for demarcation. In all other respects, he considers the Madras system worthy of admiration.

10. TEMPORARY ESTABLISHMENT.—A temporary establishment under Captain Priestley was sanctioned by the Supreme Government for two years and* two officers were attached to the party to be trained in the method of working. In granting sanction† however, it was observed by the Governor-General in Council that "His Lordship's only doubt in respect to the scheme of survey has arisen from the known difficulty of plotting fields from a Khusreh Amin's return within an exterior boundary laid down by scientific survey.

* Lieutenant Hessey, 21st N. I., and Pratt, 84th Foot.

† G. O. G. I. No. 3120, dated 8th Sept. 1854.

	Rs.	A.	P.
1 Captain F. J. B. Priestley...	575	0	0
2 European Assistants ...	460	0	0
1 Mr. Starr, Head Surveyor...	70	0	0
2 Head Surveyors or Artificers at 70 Rs. each	140	0	0
6 Deputy Surveyor at 30 Rs. each	180	0	0
30 Survey Amins from Rs. 17½ to Rs. 20	562	0	0
30 Amins and Goomastahs at 10 Rupees each	300	0	0
3 Writers, 25 Rs. each ...	75	0	0
3 Draughtsmen, 20 Rs. each..	60	0	0
3 Duffadars, 7 Rs. each ...	21	0	0
126 Measurers from Rs. 4 to 5.	528	0	0
3 Computers, 20 Rs. each ...	60	0	0
18 Peons from Rs. 5 to 7 ...	96	0	0
Travelling allowance or tentage and batta to Head and Deputy Surveyors, Amins, and Goomastahs	225	0	0
	3,292	8	0
Additional Contingent charges.	37	8	0
Total per mensem...	3,330	0	0
For 12 months...	39,960	0	0
Deduct two months' batta not drawn	450	0	0
Net Amount...	39,510	0	0

11. This establishment was maintained till 7th March 1858, and turned out work at an average cost of Rupees 86-3-5 per square mile.

Square miles 1293.

12. The method of field measurement proposed by Captain Priestley and described at page 40 of Sel: Rec: Madras Government, No. IX., under the title of the "*Combined method*" was tried by this temporary establishment. It consisted in measuring the fields by chain and cross staff and plotting them within a boundary already drawn beginning at a corner of the boundary and continuing to plot from the boundary inwards. It was not found so suitable as that of measuring four sides and a diagonal, being incomprehensible to the ryots who raised objections to it and to offsets being taken through standing crops, &c. It was more difficult to train men to it, and unless the measurement and offsets were very accurate, the plot would not close.

13. In his report on the work of the survey during 1856, the Officer in charge mentions that the boundary demarcation was performed in so unsatisfactory a manner by the Taluq authorities that he was compelled to set on foot a small establishment for the purpose, from among his own subordinates at a monthly cost of Rupees 85. He also describes the field demarcation performed by the

Survey Amins to consist of a wooden picket surrounded by a heap of earth at the corner of each field. This was found to last for about a year, unless intentionally removed, sufficiently long in fact to admit of test and correction. He points out that at the desire of the Collector of South Arcot, every field had been measured and plotted down to 0·06 acre, and that if this minute survey was considered necessary, a larger scale for maps would be requisite, that of 3 Chains=1 inch being recommended. The Great Trigonometrical Survey Records were received too late in the year to be made use of in connecting work in South Arcot with the Great Trigonometrical Survey Stations.

14. In the meanwhile, the want of an accurate measurement of lands being universally felt and its necessity unanimously admitted, a scheme for the General Survey of the Presidency was sanctioned by the Court of Directors after considerable correspondence between the Board of Revenue, the Government of Madras, the Government of India and the Court.

15. Scheme for General Survey of the Presidency sanctioned—*Selection from the Records of the Madras Government, No. LIII.*—The scheme embraced the production of Field, Village and Taluq maps to secure the permanency of the sanctioned survey. The area of the Presidency was estimated at 120,000 square miles requiring to be surveyed for area, but only one half or 60,000 would, it was thought, come under the minute or field survey at a cost of Rupees 64 per square mile and would occupy twenty-two years in execution.

16. The Madras Government, in giving detailed instructions, express their opinion "that the survey should decidedly be a perfect one" and "that every particular of Topographical or revenue importance should be exhibited and no expense will be vain to secure perfection in these two respects." They also approved of the scales to be used for Village, Taluq and District maps.

17. Scheme for general classification and settlement sanctioned.—At the same time, a sum of Rupees 38,40,000 was sanctioned for the Classification and Settlement of the Presidency at an average rate of Rupees 64 per square mile.

18. In June 1857, Captain Priestley was appointed to superintend the proposed survey and directed to submit a plan of operations and list of establishment. Mr. Newill of the Civil Service was gazetted Director Revenue Settlement.

19. In the year 1858, revised estimates were prepared and sent in. In these estimates, it was calculated that the Survey and Settlement of the whole Presidency would be completed in fourteen years at a total cost of Rs. 76,40,000 or Rs. 118 per square mile. The decreased rate was to be attained by

	Rs.	A.	P.
1 Deputy Superintendent... 500 Travelling Allowance. 75 Contingent charges ... 100	675	0	0
1 European Assistant ... 325 Travelling Allowance ... 75	400	0	0
1 European Assistant... ... 225 Travelling Allowance ... 75	300	0	0
4 Head Surveyors from Rs. 70 to 100	340	0	0
8 Deputy Surveyors from Rs. 30 to 50.	290	0	0
4 Detail Surveyors from Rupees 20 to 25.	85	0	0

See letter from H. Forbes, Esq., Actg. Secretary to Government, to Government of India, dated 25th January 1858, No. 97, para. 12 page 233, Vol. LIII., Selections of Government Records.

	Rs.	A.	P.
For Settlement per sqr. M.	51	0	0
„ Demarcation do.	10	0	0
„ Survey do.	55	0	0
„ Lithographic Dept. do.	2	0	0

Proceedings of the Madras Government, Revenue Department, 11th May 1874.

	Rs.	A.	P.
40 Survey Amins from Rs. 10 to 14	440	0	0
40 Goomastahs from Rs. 7 to 9	310	0	0
1 Office Manager	75	0	0
1 Head Writer and Computer.	35	0	0
9 Writers and Computers from Rs. 15 to 25...	190	0	0
1 Head Draughtsman	50	0	0
15 Draughtsmen from Rs. 15 to 35	325	0	0
3 Duffadars or Head Peons from Rupees 7½ to 8	23	0	0
27 Peons from Rs. 4 to 6	125	0	0
55 Measuring Peons from Rs. 4 to 5	247	0	0
26 Station markers from Rs. 4½ to 7	121	0	0
4 Muchies from Rs. 4½ to 5½ ...	19	0	0
1 Blacksmith	5	0	0
1 Chuckler or worker in leather.	5	0	0
Measurement allowance... ...	630	0	0
Total...	4,690	0	0

increasing the number of men in the lower grades, leaving the officers at the same strength as in the original estimate.

20. The Settlement Department was entrusted with the duty of demarcation. Demarcation parties were formed and commenced work under the orders of Messrs. Banbury and Master in South Arcot, Trichinopoly, and Rajahmundry.

21. In 1858, Lieutenant Hessey was appointed Deputy Superintendent Revenue Survey, of the first party, and Captain Crewe, First Assistant Superintendent was sent to Rajahmundry where he received charge of the second party which had been then set on foot by the Superintendent. A third survey party was organized in Masulipatam by the Superintendent and in 1859, was handed over to Captain Pratt, 84th Foot, promoted to be Deputy Superintendent.

22. A Revenue Survey of the Wynaad being considered absolutely necessary by the local Government, they directed that immediate measures should be taken for commencing the Survey of that taluq. A fourth party was commenced before the end of 1859 under Captain Hessey temporarily detached for the purpose.

An account of the Madras Revenue Survey from its sanction in 1858 to the year 1872 Inclusive.

23. History of No. 1 Party.—After the general survey was sanctioned, No. 1 Party, under Lieutenant Hessey, not only completed what remained in the party surveyed taluqs of the South Arcot District but also executed by the close of 1859, a survey of 650 square miles, or in all 1891 square miles, as per margin, completed since the commencement of the survey.

Scale.		Rs.	A.	P.
1 Deputy Supt	500	575	0	0
Travelling Allowance ...	75			
1 European Assistant ...	350	425	0	0
Travelling Allowance ...	75			
1 European Assistant ...	250	325	0	0
Travelling Allowance ...	75			
1 Sub-Assistant... ...		150	0	0
8 Head Surveyors from Rs. 50 to 100		580	0	0
12 Deputy Surveyors from Rs. 30 to 50.		450	0	0
6 Detail Surveyors from Rs. 20 to 25.		135	0	0
60 Amins from Rs. 12 to 14 Rs. 10		789	0	0
30 Goomastahs from Rs. 7 to 9		316	0	0
1 Office Manager		100	0	0
1 Head Writer and Computer.		50	0	0
11 Writers and Computers from Rupees 15 to 30		268	0	0
1 Head Draughtsman		75	0	0
19 Draughtsmen from Rs. 15 to 50		485	0	0

South Arcot ...	514	
Trichinopoly ...	1377	

24. In 1859, work was provided by the Settlement Department in the Nagapat Taluq through the agency of the Trichinopoly District, was still incomplete. The survey of a fifth district (Salem) was thus undertaken, an arrangement which required the Deputy Superintendent in the south to supervise men employed in two districts.

		RS.	A.	P.
2	Duffadars or Head Poons at 10 Rupees	20	0	0
13	Peons from Rs. 7 to 8. ...	93	0	0
140	Peons, measurers included at Rupees 6 each	840	0	0
4	Muchis from Rs. 5 to 8 ...	25	0	0
1	Blacksmith	5	0	0
1	Chuckler or worker in leather.	5	0	0
	Measurement allowance ...	768	13	4
	Total...	6,664	13	4

25. The survey of 2939 square miles of the Trichinopoly District may be said to have been completed before the close of 1861. In subsequent years however, the measurement of additional cultivation was undertaken by the survey.

26. The survey of the Salem, as well as of the Coimbatore District (the latter taken in hand to provide work for Surveyors returned from Wynaad there being no demarcation ready elsewhere) was delayed by defective demarcation. The extent of country surveyed by Lieutenant-Colonel Hessey's party in the plains up to 31st December 1872 is as follows:—

South Arcot...	...	514 Square miles.
Trichinopoly...	...	2939 do.
Salem ...	...	4531 do.
Coimbatore ...	...	3645 do.

27. History of No. 2 Party—Scale same as that of No. 1 Party.—The party in Rajahmundry commenced its operations in September 1858, and completed before March 1863, the survey of the Ryotvari villages in nine taluqs, composing the present Godavery District, representing an area of 3392 square miles. Certain portions of the district were excluded from demarcation by the Settlement Department, and consequently not undertaken by the survey; the field of operations being determined altogether by the Director Revenue Settlement with regard to its advantage in a Revenue point of view. All that could be effected under these conditions therefore in the excluded tracts was the survey of main roads and adjacent chief topographical details.

28. In G. O., No. 1594 of 23rd November 1859, the Director Revenue Settlement was desired in communication with the Superintendent Revenue Survey, to report upon the additional means proper to be adopted for expediting the survey of the Godavery and Kistna Districts. Arrangements were accordingly proposed and sanctioned, by which the strength of the Northern parties was raised. An auxiliary party of half the strength of a full party at a cost of (Rupees 43,923 per annum) was organized in the Godavery District. The proposal by the Director Revenue Settlement, to relax the rigid standard of accuracy enforced in village maps was approved of by Government though earnestly deprecated by the Superintendent. In practice, however, the maximum error has not exceeded 1·48, and the average error, is 0·48 per cent.

29. In 1859, a detachment from No. 2 Party was drafted to Kurnool to commence operations there under Lieutenant Pavy 74th Highlanders. The remainder of the party followed, as work was completed in Rajahmundry.

30. The survey areas and maps of villages coming under the influence of the Irrrigation and Canal Company's operations being those first required, surveyors were necessarily much scattered along the line of canal. To this and to the boundaries of taluqs being left undemarcated, is attributable the non-completion of the survey of many of the taluqs up to the present date. Surveyors were also required in Kurnool to sub-divide fields for the convenience of irrigation accounts and to measure putta holdings. The extent surveyed by the party since its organization up to 31st December 1872 is, as will be seen from the margin, 9159 square miles.

Godavery	3392	Square miles.	
Kurnool	5767	Do.	

31. History of No. 3 Party—Scale, same as that of No. 1 Party.—The nucleus of a third party was handed over by the Superintendent to Captain Pratt in April 1859. Augmented by drafts of men from the senior parties, it commenced survey operations in the late Masulipatam (now Kistna) District, but the party was not raised to its full strength till the September following.

32. The survey of 6378 square miles of country in the eleven taluqs composing the district was completed by the close of 1864. The delineation in village maps of topographical details in some of the taluqs first entered on was found very meagre, and was therefore supplemented by a plane table survey on a scale of 2 inches = 1 mile for the construction of taluq maps. Similar neglect has not since then occurred.

33. By the cyclone of the 1st November 1864, maps of 171 villages completed and in different stages of preparation, also Survey and Demarcation records, were either destroyed or materially injured at Guntoor. The retention of the Head Quarters of the party in the Masulipatam District for some time was therefore found necessary. The measurement of 60 square miles of additional cultivation in fields was performed simultaneously with the restoration of the destroyed records.

34. In 1865, a detachment from the party (No. 3) commenced work in the Cuddapah District under Mr. J. Tomlinson, who remained in charge till relieved by Colonel Crewe in April. The total extent surveyed by the party up to December 1872 is 9262 square miles.

Kistna	6378	Square miles.	
Cuddapah	2884	Do.	

35. History of No. 4 Party Present—Scale, same as that of No. 1 Party.—The fourth party was organized by drafts of men from No. 1 Party. The work on which it was engaged at first was of a special nature, because Wynaad (where the working season is limited to five months in the year) presents many formidable obstacles. Great difficulty was experienced in inducing men to take service in Wynaad, and much time was lost in moving the party there and back, till its final transfer to the Tinnevelly District, agreeably to G. O., No. 895 of 25th April 1862, Tenkasy Taluq was first handed over for survey by the Settlement Department, and survey operations were extended gradually to the other taluqs. Extremely defective demarcation and other circumstances delayed the progress of the survey which, however, has now completed the district with the exception of a hilly tract to the N. West, a long standing dispute concerning the boundary between Tinnevelly and Travancore territory having hitherto prevented its demarcation. Marginally is given the extent surveyed by the party up to the end of 1872, exclusive of what was performed in the Salem and Coimbatore Districts noted under another head.

Wynaad	191	Square miles.	
Tinnevelly... ...	4560	Do.	
Madura	90	Do.	

		Rs.	A.	P.
2	Duffadars or Head Peons at 10 Rupees	20	0	0
13	Peons from Rs. 7 to 8. ...	93	0	0
140	Peons, measurers included at Rupees 6 each	840	0	0
4	Muchis from Rs. 5 to 8 ...	25	0	0
1	Blacksmith	5	0	0
1	Chuckler or worker in leather.	5	0	0
	Measurement allowance ...	768	13	4
	Total...	6,664	13	4

25. The survey of 2939 square miles of the Trichinopoly District may be said to have been completed before the close of 1861. In subsequent years however, the measurement of additional cultivation was undertaken by the survey.

26. The survey of the Salem, as well as of the Coimbatore District (the latter taken in hand to provide work for Surveyors returned from Wynaad there being no demarcation ready elsewhere) was delayed by defective demarcation. The extent of country surveyed by Lieutenant-Colonel Hessey's party in the plains up to 31st December 1872 is as follows:—

South Arcot...	...	514 Square miles.
Trichinopoly...	...	2939 do.
Salem ...	...	4531 do.
Coimbatore ...	...	3645 do.

27. History of No. 2 Party—Scale same as that of No. 1 Party.—The party in Rajahmundry commenced its operations in September 1858, and completed before March 1863, the survey of the Ryotwari villages in nine taluqs, composing the present Godavery District, representing an area of 3392 square miles. Certain portions of the district were excluded from demarcation by the Settlement Department, and consequently not undertaken by the survey; the field of operations being determined altogether by the Director Revenue Settlement with regard to its advantage in a Revenue point of view. All that could be effected under these conditions therefore in the excluded tracts was the survey of main roads and adjacent chief topographical details.

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30. The survey areas and maps of villages coming under the influence of the Irrigation and Canal Company's operations being those first required, surveyors were necessarily much scattered along the line of canal. To this and to the boundaries of taluqs being left undemarcated, is attributable the non-completion of the survey of many of the taluqs up to the present date. Surveyors were also required in Kurnool to sub-divide fields for the convenience of irrigation accounts and to measure putta holdings. The extent surveyed by the party since its organization up to 31st December 1872 is, as will be seen from the margin, 9159 square miles.

Godavery	3392	Square miles.	
Kurnool	5767	Do.	

31. History of No. 3 Party—Scale, same as that of No. 1 Party.—The nucleus of a third party was handed over by the Superintendent to Captain Pratt in April 1859. Augmented by drafts of men from the senior parties, it commenced survey operations in the late Masulipatam (now Kistna) District, but the party was not raised to its full strength till the September following.

32. The survey of 6378 square miles of country in the eleven taluqs composing the district was completed by the close of 1864. The delineation in village maps of topographical details in some of the taluqs first entered on was found very meagre, and was therefore supplemented by a plane table survey on a scale of 2 inches = 1 mile for the construction of taluq maps. Similar neglect has not since then occurred.

33. By the cyclone of the 1st November 1864, maps of 171 villages completed and in different stages of preparation, also Survey and Demarcation records, were either destroyed or materially injured at Guntoor. The retention of the Head Quarters of the party in the Masulipatam District for some time was therefore found necessary. The measurement of 60 square miles of additional cultivation in fields was performed simultaneously with the restoration of the destroyed records.

34. In 1865, a detachment from the party (No. 3) commenced work in the Cuddapah District under Mr. J. Tomlinson, who remained in charge till relieved by Colonel Crewe in April. The total extent surveyed by the party up to December 1872 is 9262 square miles.

Kistna	6378	Square miles.	
Cuddapah... ...	2884	Do.	

35. History of No. 4 Party Present—Scale, same as that of No. 1 Party.—The fourth party was organized by drafts of men from No. 1 Party. The work on which it was engaged at first was of a special nature, because Wynaad (where the working season is limited to five months in the year) presents many formidable obstacles. Great difficulty was experienced in inducing men to take service in Wynaad, and much time was lost in moving the party there and back, till its final transfer to the Tinnevelly District, agreeably to G. O., No. 895 of 25th April 1862, Tenkasy Taluq was first handed over for survey by the Settlement Department, and survey operations were extended gradually to the other taluqs. Extremely defective demarcation and other circumstances delayed the progress of the survey which, however, has now completed the district with the exception of a hilly tract to the N. West, a long standing dispute concerning the boundary between Tinnevelly and Travancore territory having hitherto prevented its demarcation. Marginally is given the extent surveyed by the party up to the end of 1872, exclusive of what was performed in the Salem and Coimbatore Districts noted under another head.

Wynaad	191	Square miles.	
Tinnevelly... ...	4560	Do.	
Madura	90	Do.	

36. History of No. 5 Party.—*Scale same as that of No.* 1 *Party.*—The auxiliary Party, sanctioned for the Godavery District in G. O. of the 28th December 1859, and referred to in paragraph 28, was transferred to Nellore, and augmented by large drafts of men from Nos. 1 and 3 Parties. This formed a fifth Party, and commenced the revenue survey of the district in March 1861 under Mr. Puckle. The Nellore Taluq was not at first demarcated with stone, consequently a great many marks disappeared, and much difficulty was experienced in making corrections. The survey of waste lands and unsettled boundary disputes prolonged the completion of the field and boundary work to 1866. At the close of that year, a small Party of Surveyors was sent to the Madras (now Chingleput) District, in which the demarcation is performed by the Revenue Survey Department, under Orders of Government, dated 12th December 1864, No. 2,243.

37. On the transfer of the head quarters to the Chingleput District a detachment remained to finish arrears of work and to carry on the demarcation and survey of Zemindari tracts and of hill ranges excluded from demarcation. The line dividing Nellore from Kurnool and Kistna has been demarcated by the Survey, the Settlement Department having declined to undertake the duty. The long delay in settling and defining the boundary line between this district and Cuddapah has hitherto stood in the way of the completion of the District Map of Nellore.

38. The non-settlement of the boundary between the Trivellore Taluq and the adjoining Zemindari tracts retarded the progress of survey in the Chingleput District; but, the demarcation being good, the survey of five out of six taluqs taken in hand has been completed, and area lists for all the villages in four taluqs have been lodged in the Central Survey Office for settlement purposes. The extent of country surveyed is given in the margin.

Nellore ...	8,462	square miles.
Chingleput ...	2,834	do.
North Arcot ...	110	do.

39. History of No. 6 Party.—At the desire of the Court of Wards, who were anxious that an accurate Revenue record should be made of the Purla Kimedy Estate (in Ganjam, which was, and is still, under wardship), the Superintendent in 1863 organized a small Party for the survey of the Zemindari, which he placed under Lieutenant Wynch. It was at first intended that the Manager of the estate should perform the necessary demarcation, but after a short time it was found necessary to have an establishment trained by the Survey during one year. The charge of it then reverted to the Revenue Officers. The survey of the estate, comprising 544 square miles, came to a close during the Superintendent's absence on sick leave in 1866, and the establishment served to form the nucleus of the 6th and last Survey Party organized in Ganjam in September 1866, of half the usual strength, in compliance with G. O., No. 2,054, of 31st August 1865. Up to date it has surveyed 824 square miles and completed the Chicacole Taluq.

Scale of Establishment for Purla Kimedy.

		Rs.	A.	P.
1	Assistant Superintendent ...	450	0	0
1	Sub-Assistant...	150	0	0
13	Surveyors	650	0	0
20	Amins, etc.	230	0	0
88	Measuring Peons, etc... ...	452	0	0
13	Computers and Draughtsmen	400	0	0
	Total...	2,332	0	0

Scale of No. 6 *Party.*

		Rs.	A.	P.
1	Military Assistant	681	10	0
1	Sub-Assistant...	150	0	0
5	Head Surveyors, from Rs. 50 to 100	380	0	0
10	Deputy Surveyors, from Rs. 25 to 50	340	0	0
10	Detail Surveyors, from Rs. 17½ to 25	200	0	0
30	Amins, from Rs. 10 to 14 ...	360	0	0
30	Gumastahs, from Rs. 8 to 10	270	0	0
1	Manager	75	0	0
7	Writers and Computers ...	165	0	0
11	Draughtsmen	270	0	0
1	Duffadar	10	0	0
55	Measuring Peons, &c. ...	340	0	0
	Measurement allowance	384	6	8
	Measurers	289	8	8
	Coolies	187	8	0
	Contingencies	100	0	0
	Total...	4,202	1	4

40. Madras Town Survey.—A detailed survey of all land held within the limits of the district of the town of Madras on a large scale, with divisional and key-maps on reduced scales, was ordered by Government in March 1854. The establishment originally sanctioned was increased to double its strength in 1856. The work was at first under the control of the Collector of the district, and was intended to be professionally examined from time to time by the Executive Engineer Officer at the Presidency.

Scale of Establishment.

			Rs.
2	Revenue Surveyors ...	@ 175 each	350
2	Assistant do. ...	@ 50 „	100
2	Writers	@ 20 „	40
2	Tindals	@ 7 „	14
4	Chainmen	@ 5½ „	22
2	Instrument-bearers ...	@ 5½ „	11
2	Offset men	@ 5 „	10
4	Flagmen	@ 5 „	20
2	Lascars...	@ 6 „	12
	Total...		579

41. Test Survey.—In 1859, on the Superintendent's return to Madras after having organized the Northern Survey Parties, the Madras Town Survey was handed over to him, and, at his request, a small establishment was given him for the purpose of testing the work up to that time performed, the Engineer Officer having found it impossible to spare time from his other duties to examine it while in progress.

		Rs.
1	Head Surveyor...	50
2	Computers	35
1	Draughtsman	30
6	Measurers	37
	Total...	152

42. Up to the date of this transfer, 16½ square miles, containing 13,277 holdings (about 800 to the square mile), had been completed in the divisions marginally noted at a cost of Rupees 35,629, or Rupees 2,160 per square mile, or Rupees 2-10-11 per holding.

Mylapore.
Nungambaukum.
Triplicane.
Egmore.

43. The result of the examination of former work by the Superintendent was satisfactory; few errors were discovered, and of these not many exceeding 5 per cent.

44. The town survey was finally closed in 1863, an additional area of ten square miles, containing 14,976 holdings (about 1,500 to the square mile), having been measured and mapped for Rupees 21,255, or 2,125 per square mile, or Rupees 1-6-8 per holding, in the divisions named in the margin.

Black Town (2 Divisions).
Perambore.
Tondiarpet.

45. The great difference between the average content of holdings surveyed under the Collector and those by the establishment under the Superintendent arises from the latter having been employed in Black Town, where the land is chiefly covered by native houses and backyards averaging 0·08 acre in extent.

46. The maps were lithographed after survey for revenue, municipal, engineering, and other Government purposes. A combined map on a reduced scale, showing the municipal divisions, has been compiled and lithographed in the Survey Office to aid the Census Commissioners and the Engineers engaged on the Madras Water Works. To some extent, a demand exists for divisional and key-maps, and for extracts showing particular holdings.

47. Special Survey, Wynaad.—In paragraph 22, the circumstances connected with the undertaking of the survey of the Wynaad Taluq have been mentioned. Both the survey and demarcation operations were carried on during the working seasons of 1860,* 61, and 62,† and a small detachment was sent early in 1863 to complete unfinished surveys. Meanwhile, from a consideration of the expense, Government resolved to reduce the establishment, merely to carry out the survey of Government land and private estates (the latter on payment), and to ascertain from time to time the taxable cultivated area. For this purpose, an establishment, at a monthly cost of about Rupees 1,000, was placed under the Collector of Malabar. This system, with some modification, was continued till the end of 1866, when, being found unsatisfactory, the survey was again handed over to the Superintendent, and arrangements were made for employing the Surveyors, who were at the time under Captain Sargeaunt on the Nilgiris, when work could not be carried on in Wynaad. The demarcation performed by the Revenue Department being found defective, the performance of the duty was also handed over to the Survey Department, and an efficient establishment for both demarcation and survey was sanctioned in G. O., No. 1,225, 10th August 1870, and has since then continued to work under Captain Sargeaunt on the Nilgiris, in Wynaad and in Nellumboor (a part of the Malabar District), according to the season.

* Under Captain Searle.
† Do. do. Barber.

Demarcation.

		Rs.
2 Head Gumastahs ...	@ Rs. 60 each	120
20 Demarcation Gumastahs	@ 30 „	600
2 Office Gumastahs ...	@ Rs. 30 „	60
25 Peons	@ Rs. 7 each	175
Batta	... ...	284
Stone allowance...	... ...	100
For one month...		1,339
For five months...		6,695

Survey.

		Rs.
1 Assistant Superintendent	...	750
Batta, Rupees 5 per diem	...	150
2 Sub-Assistants, Rs. 250 and 200		450
10 Surveyors, Rupees 130 each	...	1,300
103 Peons and Measurers	... ...	750
3 Writers and Gumastahs	... ...	100
Batta	... ...	755
Station allowance	... ...	100
For one month...		4,305
For five months...		21,525
Cost of Demarcation...		6,695
Total...		28,520
Contingencies...		1,500
Grand Total...		30,020

48. Nilgiris.—In 1866 Government directed that a systematic detailed survey on a large scale should be made of the three settlements (Ootacamund,

Coonoor, and Kotagherry), and also of outlying estates, waste land blocks, Government reserves, &c. Till then Surveyors had been merely detached as required for the survey of waste land blocks on the Hills. No officer being at first available, Mr. Starr, the Senior Central Office Assistant, directed the work of demarcation and survey till relieved by Lieutenant Freeth, R.A., of the Coorg Survey during the S. W. monsoon, when work was impracticable on the West Coast. After his departure Mr. Starr was again put in charge. On the return of the Superintendent from leave at the end of 1866 he placed the control of the detachment of No. 1 Party, employed on the Hills and in Wynaad, in the hands of Major Hessey, the Deputy Superintendent of the Party. It has been successively in executive charge of Sub-Assistant Mr. Fraser, Lieutenant Clerk (Coorg Survey) for a few months, and Captain Sargeaunt for four years in all.

49. Nellumboor.—Early in 1870, a Surveyor from the Wynaad and Nilgiri detachment was despatched to the Nellumboor Valley in Malabar to commence the survey of the teak plantations and Government forests. The demarcation was at first undertaken by the Forest Superintendent. It was, after a short time, considered expedient that the Survey Department should also perform this duty.

50. During each subsequent working season from one to four Surveyors have been thus employed. The extreme unhealthiness and remoteness of the locality, the want of labour which had to be imported, and the short working season, tended to render this survey both tedious and expensive. However, as ascertained from personal inspection by the Superintendent, it has been thoroughly and satisfactorily performed.

51. Shervaroy Hills.—The survey of the Salem District did not at first embrace that of the Shervaroy Hills; but in 1861, when work was stopped by the S. W. monsoon in Wynaad, some of the Surveyors engaged there were transferred under an Assistant Superintendent to these Hills for employment till the season permitted of work being resumed in Wynaad. The climate being unsuited to natives of the plains, the demarcation defective, and the Survey Assistant having neglected his instructions, but slow progress was at first made. During each successive hot season, for three years, a detachment from the Salem Party was thus employed. Besides maps of coffee estates and of the area under cultivation by the Mallialies (Hill men), a general map, of the whole plateau was provided.

52. The assessment was revised in 1864 by the Collector of the district, the Hon. D. Arbuthnott, and satisfactorily settled on the survey data.

53. Ponachy Hills.—The demarcation and survey of nineteen properties on the Annamallay Hills, of which eight are coffee plantations, were performed, in 1869, on the requisition of the Collector of the Coimbatore District.

54. Demarcation.—Previous to the sanction of the revised estimates in 1858 there had been no special demarcation at all. The value of the work that had been done was much lessened by the difficulty in recovering the limits of such fields as had no natural boundaries. Under the new scheme, not only were the boundaries of villages to be demarcated, but also every field having a number in the Survey

accounts was to be marked out so as to be easily recognizable at any future period. As mentioned in paragraph 20, this duty was undertaken by the Settlement Department (1858).

55. In the South Arcot District and in Trichinopoly there was a considerable extent of country already surveyed which required to be demarcated and settled. The department had also to demarcate in advance of the Survey. The Torriore Taluq (now Moosery) was taken up for the purpose, whilst the Survey continued at work on the old system in the Volkondapuram (now Perambalore) Taluq.

56. Subsequently, the Salem, Kistna, Nellore, Kurnool, Cuddapah, Coimbatore, and Tinnevelly Districts, and the Wynaad Taluq, Malabar District, were taken up for demarcation by the Settlement Department. Of the above, some have been completed, others are in progress, and others again have been abandoned by the Settlement Department.

57. The demarcation was, from the first, found unsuited to survey requirements, but it was not till 1860 that the Superintendent advocated its being handed over to the Survey. This proposal was opposed by the Director, Revenue Settlement, but circumstances at last induced the Government to consent to the change.

58. In the year 1864 it was resolved by Government that the work of demarcation should be performed by the Survey. In 1866 demarcation was commenced by the Survey on fixed principles in the Madras District (now Chingleput), in Ganjam, and, a year after, in Coimbatore.

G. O., 12th December 1864, No. 2,243, paragraph 23. The Government resolve, therefore, that in all districts hereafter taken up the demarcation shall be performed by the Survey Department.

59. History of No. 1, Chingleput Demarcation Party.—The first Demarcation Party under the Survey Department was set on foot in 1866, men having been transferred from the Settlement Department for the purpose and placed under the orders of Lieutenant Cloete, 1st Assistant Superintendent, Revenue Survey. Work was commenced in the Sydapet Taluq, an unfortunate choice of locality as it turned out, the land being chiefly owned by wealthy and litigious non-resident landlords and the occupants a needy class frequently paying excessive rents. Material for demarcation marks was not easily procurable, the quarries being inconveniently situated and stone-cutters few in number and exorbitant in their demands. A revision of the demarcation rules was made, and men entertained and specially trained for performing demarcation according to fixed rules.

Scale.	Rs.	A.	P.
1 Military Asst. Supt.... 350 Travelling allowance.... 75	425	0	0
1 Uncov. 2nd Asst. Supt. 250 Travelling allowance.... 75	325	0	0
Regimental allowance of a Lieutenant on Staff Corps.	256	10	0
2 Inspectors	250	0	0
2 Dy. do.	90	0	0
4 Office Gumts. from Rs. 12 to 15	54	0	0
17 Head Gumts. from Rs. 20 to 30	400	0	0
52 Gumastahs, from Rs. 12 to 15	714	0	0
1 Duffadar or Head Peon... ...	10	0	0
100 Peons, from Rs. 6 to 8... ...	612	0	0
3 Moochies, from Rs. 7 to 9 ...	23	0	0
1 Sweeper...	5	0	0
Contingencies	100	0	0
Boundary-pillars	853	5	4
1 Dresser	24	8	0
Office accommodation (on average)	60	12	4
Total...	4,183	4	8

60. As was anticipated, progress was for some time slow and the cost high. The work, however, was good, permanent, and suited to both survey and settlement requirements.

61. The Party has successively taken up the Sydapet, Trivellore, Ponairy, Conjeveram, Chingleput, and Madurantakum Taluqs, which compose the Chingleput District, and is now working, as part of No. 5 Survey Party, in the Arcot and Wallajah Taluqs of North Arcot District.

62. The combined system of demarcation and survey was adopted in the Chingleput Taluq, and has been continued with satisfactory results in those subsequently entered on.

63. Demarcation was retarded by the causes affecting the progress of survey, noted in paragraph 38. The non-attendance and the delay in erecting field-marks by villagers were for some time found serious obstacles, and it was deemed expedient to demarcate under the provisions of Section 7 of Act XXVIII. of 1860, Government providing and erecting marks in the first instance and recovering the cost from the owner or occupant. This necessarily expensive system has, however, been entirely got rid of—thanks to the good-will and co-operation of the ryots, who, at present, not only provide field-stones, but also on payment those required by Government.

64. The total area demarcated by this Party is 4,733 square miles.

65. History of No. 2, Ganjam Demarcation Party.—No. 2 Demarcation Party was organized under Mr. Cardozo, 1st Assistant Superintendent, in August 1866, the four previous months having been occupied in training men and collecting materials. Like No. 6 Survey establishment, to which it was attached, its strength was only half that of a full Demarcation Party. Chicacole Taluq, Ganjam District, was the locality selected by the advice of the Collector as that in which work should commence.

Scale.	Rs.	A.	P.
1 2nd Assistant Superintendent...	325	0	0
1 Inspector	100	0	0
1 Deputy Inspector	40	0	0
2 Office Gumastahs, from Rs. 12 to 15	27	0	0
5 Head Gumastahs, from Rs. 20 to 25	110	0	0
25 Demarcation Gumastahs, from Rupees 12 to 15	336	0	0
33 Peons, from Rupees 6 to 7 ...	199	0	0
Contingencies...	50	0	0
Average cost of erecting boundary pillars	416	13	4
Office accommodation (on average).	60	10	8
Total...	1,664	8	0

66. In this taluq a contractor was employed to provide stones of the approved patterns and duly marked. From him the ryots purchased field-stones at a fixed very low rate.

67. On moving to the Berhampore Taluq, at the recommendation of the officer in charge, recourse was had to Section 7 in order to accelerate progress. It was, however, found practicable to revert to the original arrangement for supplying field-stones in the villages of the Berhampore Taluq last taken up and in those composing the [illegible]msoor Taluq, at the same time introducing the combined system by which No. [illegible]cation Party works conjointly with No. 6 Survey.

68. [illegible] Ganjam evinced so decided a desire to have each individual holding separately demarcated and surveyed that it was considered advisable, for the

purpose of gaining their co-operation, to carry out their wishes. Demarcation marks were obtainable at such low rates that it was hoped no material increase of cost would result in the only three taluqs belonging to Government.

69. It has, however, been found that the minute sub-divisions of land cannot be thus dealt with except at a greatly increased expenditure of time and money. Orders have, therefore, been issued to combine several holdings into one survey-field where land is not exceptionally valuable.

70. The Party has in all demarcated 813 square miles.

71. History of No. 3 Coimbatore Demarcation Party.—*Scale same as that of No. 1, Demarcation Party.*—This Party was started in 1867 in charge of Captain Baynes, 91st Foot, 1st Assistant Superintendent, in order to complete the Darapuram Taluq, Coimbatore District, of which one-half had been demarcated by the Settlement Department.

72. It has since then taken up the Caroor, Polachy, and Oodimallycottah Taluqs of the same district and the meotahs in that of Salem. It has also renewed the demarcation of the Coimbatore and Pulladum Taluqs of Coimbatore, besides demarcating some villages of the latter taluq originally excluded by the Settlement Department.

Demarcated in all 3,072 square miles.

73. The taluqs of Polachy and Oodimallycottah have been successfully undertaken on the system of combined demarcation and survey by which the Demarcation establishment is merged into No. 1 Survey.

74. The Party has proved useful in furnishing drafts of trained men to other districts.

75. From the first field-stones have been supplied by a contractor to ryots on payment at a fixed rate.

76. Land in this district being held in larger blocks than in most others, it has been found possible to deal with each individual holding without unduly swelling expenditure. The ryots have invariably evinced good will and have cheerfully afforded assistance.

77. History of No. 4 Madura Demarcation Party.—In the Madura demarcation and survey have been introduced together, both processes proceeding *pari passu*.

78. Preliminary inquiries and arrangements for the supply of demarcation material having been made the previous year, a small combined Party under Captain Thompson, R.A., Assistant Superintendent, composed of detachments from Tinnevelly and Coimbatore, was, by desire of the Board of Revenue, despatched in 1871 to the Cumbum Valley to commence work in the Periakolam Taluq. The locality being feverish, the working season only commences in July and lasts till the advent of the N. E. monsoon at the beginning of November. The work thus initiated has been extended to the rest of the taluq where the season for work is not so limited.

79. The revenue survey of the Tinnevelly District having, as stated in paragraph 35, been brought to a close, the establishment of N[illegible]ty under the Deputy Superintendent, Captain Cloete, is being transferred [illegible] District.

80. At first it was found necessary for Governme[illegible] stones by importing and engaging stone-cutters; but Captain Cloete [illegible] that the

villagers at present undertake to supply their own field marks and also those required by Government on payment, as is done in Chingleput and North Arcot.

81. In compliance with the orders of the Court of Wards, orders have been issued to commence the detailed demarcation and survey of the Bodinaiknur Zemindari which forms part of the Periakolam Taluq.

82. History of No. 5 Bellary Demarcation Party.—In Bellary, with the concurrence of the Collector, it was decided to take up the Adoni Taluq for demarcation and survey as men could be transferred from No. 2 Survey Party on the completion of the Revenue Survey of the Kurnool District.

83. Mr. Merriman, Assistant Superintendent, was transferred to Coimbatore for three months, for instruction in demarcation, and has been placed in charge of both demarcation and survey on the combined system in Adoni.

84. Endeavours to introduce the system found so advantageous in the Chingleput and North Arcot Districts for the supply of all Demarcation stones through the ryots, have been successful.

85. Lithographic Establishment.—In February 1858, sanction was accorded by the Government of India for the formation of a Lithographic Establishment at a monthly cost of Rupees 751. A commencement was made in that year; but the operations were confined to mere preliminaries, as the Superintendent, being engaged in organising the two Northern parties, was frequently on the move and carried with him his office and the eight or ten men who composed the Lithographic Establishment. He was thus unable, till the beginning of 1860, to establish his Central Office at Madras with which the Lithographic Establishment was to be connected in order that the responsibility for the correctness of the work might be borne by the Revenue Survey Department from beginning to end. Previous to the organization of the Lithographic Department under his orders, maps of sixteen villages were lithographed by the Lithographic Establishment belonging to the Department of Public Works.

Scale of Lithographic Establishment.

		Rs.	A.	P.
1	Head Draughtsman...	90	0	0
12	Draughtsmen...	375	0	0
8	Tracers...	85	0	0
1	Lithographic Writer	20	0	0
4	Printers...	60	0	0
14	Pressmen, Inkmen, etc.	80	0	0
2	Mutchies...	20	0	0
3	Peons...	17	0	0
1	Sweeper	4	0	0
	Total...	751	0	0

86. On the 1st January of the following year, the establishment consisted of the persons noted in the margin and worked three presses. Much difficulty was experienced in obtaining the services of competent men.

Head Lithographer	1
Draughtsmen	10
Tracers	6
Writer	1
Printers...	3
Pressmen, etc...	13
Mutchies...	2
Peons	2

87. Village maps were at first printed in colours to show the different tenures and descriptions of land. In 1862, symbols were substituted for colours, and again in 1866 these symbols were altogether omitted and a ribbon of colour introduced—*Vide* paras. from 91 to 93.

88. Revised scale of Lithographic Establishment.—In 1867, a proposal by

the Superintendent Revenue Survey, to raise the establishment to double its original strength was sanctioned, in order that it might keep pace with the Survey Establishments in the field which had been nearly trebled since the date of the original sanction of the Lithographic Establishment.

		Rs.	A.	P.
1	Head Draughtsman	150	0	0
8	Draughtsmen	200	0	0
5	Examiners	160	0	0
15	Tracers	200	0	0
8	Typers	60	0	0
2	Map Record-keepers	55	0	0
1	Store-keeper	40	0	0
1	Lithographic Writer	20	0	0
7	Printers	87	0	0
33	Pressmen, Inkmen, etc... ...	210	0	0
31	Mutchies	202	0	0
3	Peons...	21	0	0
1	Sweeper	5	0	0
	Total...	1,560	0	0

89. Up to December 1872, maps of 13,562 villages and estates have been printed, making in all a total of 4,56,137 copies. Twenty-eight taluq maps, 100 copies each, have also been lithographed besides those of Coonoor and Ootacamund Settlements and of the Wellington and Trichinopoly Cantonments. A very large amount of miscellaneous work has also been performed. The value of maps lithographed is, approximately estimated, Rupees 2,59,360 as shown below :—

		Rs.	A.	P.
Village	Maps	1,85,800	0	0
Taluq	do.	12,000	0	0
District	do.	3,850	0	0
Estate	do.	31,170	0	0
Skeleton	do.	1,210	0	0
Town Survey	do.	6,200	0	0
Miscellaneous	do.	10,300	0	0
Forms	do.	7,800	0	0
	Total ...	2,59,360	0	0

90. The duties of the Central Office are chiefly those of check and control. The preparation of topographical maps is also performed by the draughtsmen on its Establishment. In 1867 it was augmented simultaneously with the increase to the Lithographic Establishment. When demarcation was handed over to the survey, a small Office Establishment was attached to the Central Office.

SCALE.

		Rs.	A.	P.
1	Head Assistant	250	0	0
	Accounts Audit and Correspondence.			
1	Office Assistant	150	0	0
2	Clerks...	50	0	0
1	Record-keeper	50	0	0
1	Cash-keeper and Accountant... ...	40	0	0
2	Examiners	70	0	0
1	Despatching Clerk	15	0	0
1	Mutchi	7	8	0
	Records and Computations.			
1	Manager	100	0	0
2	Computers	60	0	0
1	Examiner	30	0	0
1	Record Gumastah	12	0	0
	Drawing Department.			
7	Draughtsmen and Examiners	270	0	0
1	Map Record Gumastah	12	0	0
1	Mutchi...	7	8	0

		Rs.	A.	P.
	Servants.			
1	Daffadar or Head Peon.	14	0	0
7	Peons	50	0	0
	Demarcation Department.			
2	Examiners	120	0	0
1	Translator	50	0	0
1	Clerk	30	0	0
1	Record-keeper	20	0	0
1	Mutchi	7	0	0
3	Peons	21	0	0
	Total...	1,436	0	0

Changes introduced from time to time in Measurement, Plotting, Computation, and Mode of Recording.

91. Method of Recording Topographical Details.—In the original village maps, the different tenures and descriptions of cultivated and fallow land were shown by appropriate colours and an exact counterpart of the manuscript maps was produced in colours by the Lithographic press. To effect this, a large number of lithographic stones were necessary and the process altogether was found tedious and costly. To remedy this difficulty, symbols were, at the beginning of 1862, substituted for colours to distinguish cultivation and tenure.

92. The information for this purpose was obtained from the village accounts and was found frequently to differ from the actual state of the ground, land termed irrigated being discovered to bear dry-crops, the source of irrigation having been destroyed by time, neglect or floods, and *vice versa*, land under luxuriant wet crops being entered in the unirrigated column, the water from which it derived its irrigation being brought from some private source. In like manner, waste land had been brought under cultivation and cultivated land had been abandoned.

93. It was therefore determined in 1865 to omit the symbols, but in order to have data wherewith to construct topographical maps, the limit of every existing block of wet or dry cultivation was distinguished in the village map by a particular ribbon of colour.

94. Change in the Computation of Field Areas.—The Superintendent had always felt that the weak point in the Madras system of survey was the mode of computing field areas. The multiplication of the mean length by the mean breadth answered as long as only applied to taks (plots) of tolerably regular shape, and to these this method had always been restricted. The content of irregular taks (plots) was obtained geometrically from the map and that of offsets was computed in like manner.

95. In 1862, the computing scale was introduced as an experiment and used to ascertain the content of irregularly shaped taks (plots) and fields. It was found to give such accurate results and to diminish labour so materially that, in 1864, the Superintendent directed that it should be generally adopted in supersession of the Khusreh or rougher method of computation described above.

96. To guard against the introduction of error, each computation is twice made independently. Where a difference between these two computations of more than acres 0·05 acres in a field of less extent than 10 acres exists, it is again computed by a third person and the mean of the two nearest areas adopted. Above 10 acres, 0·1 acre is the limit of difference permitted.

97. Very soon after commencing the tentative survey in South Arcot during 1853, the Officer in charge discovered that some additional check was required in field measurement to ensure accuracy and to point out the locality in which faulty measurement of the sides of taks (plots) had been made. The Amins were therefore directed to measure the diagonal of each tak (plot) in addition to the four sides, and evasion of this order was severely punished. The inspecting Surveyors were desired specially to examine fields of which the diagonal was omitted, and except the existence of a physical impossibility, no excuse was accepted. Subsequently, to

meet the case of error in the measurement of a diagonal itself the experiment was made of instructing Amins to note the length of *both* diagonals, one of which was certain to be correctly entered.

98. Carrying out these instructions practically amounted to surveying by triangles, and in 1866 this process was formally ordered. It permitted the field Surveyor to lay out a field in triangles in the manner most convenient for measurement, irrespective of quadrilateral taks (plots) at first followed. This in no way affected the method of plotting, whilst it secured increased accuracy and facilitated the discovery of the exact position in which an error in measurement had been made.

99. Changes in Recording Measurements.—The field-book in use by the tentative Survey Establishment in South Arcot included all the necessary Revenue details of each field measured. On the Settlement Department being set on foot, it was considered part of their duty as demarcators to record information of this description which was accordingly omitted from the survey field-book. It was apparently deemed advisable to confine the Survey Establishment strictly to its own special work; for an offer made by the officer in charge to record observations of the temperature, atmosphere and rain-fall, if provided with the necessary appliances, was declined. Rain gauges were, however, afterwards supplied, but no trustworthy record has been kept. Again it was proposed to collect statistical information for each village, the Revenue authorities, however, were of opinion that other and more suitable means of collecting this information were available.

Original Heading.

1863.

No. of Field and commencement of measurement.	Wet or Dry.	Soil.	Puttadar's name and Trees, Buildings, etc.	Sides. North and South.	Sides. East and West.	Diagonal.	No. of Field and commencement of measurement.	Boundaries. North.	Boundaries. South.	Boundaries. East.	Boundaries. West.	Measurement of Sides and area of field. Crop.	Remarks.

1863.

No. of Field and commencement of measurement.	Sides. North and South.	Sides. East and West.	Diagonal.	Boundaries. North.	Boundaries. South.	Boundaries. East.	Boundaries. West.	Area. Acres.	Area. Dec.	Trees, Buildings, etc.	Wet or Dry.	Govt. or Inam.	Remarks.

1863.

No. of Field and commencement of measurement.	Sides. North and South.	Sides. East and West.	Diagonal.	Area. Acres.	Area. Dec.	Remarks.

100. From the very beginning, the Amins had prepared an eye-sketch in which not only every field but every tak (plot) into which the field had been cut up for measurement was shown and also the measured length of the sides of each tak (plot.)

101. Early in 1863, the heading of the Amin's field-book was again modified, three columns containing information regarding tenure, cultivation and topographical items being omitted. The first two of the omitted columns were included in the Land Register compiled by the Demarcation Department. A list of topographical details noting the fields in which they were situated was kept by the detail Surveyors.

102. In September 1869, the Superintendent altogether did away with Amin's field-books. It was found that no amount of supervision and inspection nor any penalty, however severe, was sufficient to prevent the Amins from recording all their measurements in the field on the sketch alone and transcribing them on their return to their houses into the field-book which thus ceased to be an original record.

103. The Amin's sketches had hitherto been made on common country brown paper mounted on coarse cloth.

It was now determined that these sketches should be carefully drawn on good paper, to be well mounted on cloth as soon as received from the field, and that these sketches should be the only record which Amins were required to prepare on the ground.

104. From these sketches, on the survey and measurement of the village being plotted, a record was compiled, one field to each page with every measurement duly inserted.

105. It was found after a year's trial that provision was required for recording certain information; the Superintendent, therefore, directed that, in addition to the eye-sketch, every Amin should be furnished with a note-book on each page of which columns were provided for entering deductions, missing stones, unmeasured numbers, topographical items, signature of village officials and Demarcation discrepancies, etc.

106. In the same year, the general eye-sketch was superseded by devoting one page of the note-book to a sketch of a block of numbers, the opposite page containing the detailed information for the fields shown in the sketch. At the recommendation of a committee of officers, held in the beginning of 1871, and on the introduction of the combined system of demarcation and survey, a large book was introduced on each page of which the measurements and shape of one or more numbers are entered and at the end of the book the detailed information formerly given in the note-book is recorded.

107. Topographical Details.—On the completion of the field plotting, Topographical details in village maps are drawn in the maps by the Detail Surveyors on the ground. With the map in his hand on which each field is delineated, a man with very moderate abilities and pay is quite competent to perform this duty. Waste tracts included within the village boundary are surveyed in the regular manner.

108. For inserting details within the village boundary, there is no question but that the present system is preferable to the plan of having special topographical surveys made on the 4-inch or any smaller scale. The question of accuracy must be settled by the scale at present in use being 16 inches to a mile and the fact that every field is visited. As abovementioned, the present system admits of the employment of men on small pay, while to Plane Table Surveyors high pay must be given to secure the services of trustworthy and efficient men. The check afforded by the boundary of each field being laid down beforehand, and being of necessity visited by the person employed in detailing, cannot possibly be surpassed; whereas in Plane Table Surveying, except inspection and going over a portion of the ground again, there are no means of testing the accuracy of the work.

109. It has not yet been satisfactorily determined whether accuracy and cheapness are on the side of Plane Table Surveying or of surveying with Chain and Compass for merely topographical purposes. For the 4-in. = 1 mile scale, perhaps the latter has the advantage; on any smaller scale, the Plane Table is on the whole to be preferred. In hilly countries, of course, the Plane Table must necessarily be used.

110. Minimum content of Fields recorded.—There can be no doubt that, if feasible, the measurement of every separate plot of ground held on putta should be

undertaken and its position shown in the village map. In many districts, however, this it has been found impossible in practice. The number and minute size of holdings render their measurement enormously expensive, and if generally carried out, would necessitate an increase to the scale on which village maps are drawn. In one block of 50 acres, for instance, the land was divided into 511 plots averaging rather less than 0·1 acre. At present, when a village sub-division is found to contain a large number of exceptionally small fields, it is plotted on the 32 inch scale and then reduced by Pentagraph into its proper place in the village map.

111. The limit of 4 acres in dry and 2 in wet land originally assigned to survey fields has always been preserved in wet land and till this year in dry. In order to expedite the operations of survey, permission has been lately granted to club fields in poor unirrigated land up to 12 acres under certain conditions. This will doubtless save time. Fields included within survey fields are, where they exist, measured by the Settlement Department after survey operations have been closed.

112. Interstitial Fields.—In all the districts first taken up for survey, the measurement of interstitial fields (*i. e.*, of fields contained within the survey fields of 2 acres in irrigated and 4 in unirrigated land) was performed by the Survey Department.

113. On receipt of orders from Government early in 1862, however, the measurement of these minor fields was discontinued.

114. In 1864, Government desired that the survey should record the length of the sides of minor fields coincident with those of survey fields and sketch in by eye the unmeasured sides.

115. The execution of this latter order was found to entail an expense altogether out of proportion to the results attained. The measurements and sketching of these minor fields not being verified by plotting, sufficient guarantee of their accuracy was not to be obtained to satisfy survey requirements. On the representation of the Superintendent, therefore, Government in 1872 decided to omit the partial measurement and sketching ordered in 1864.

116. The Department being relieved of the measurement of minor fields is a great boon. It will now take cognizance of survey fields alone. The measurement by the superior and costly agency of the professional survey, of fields varying from 1 acre to the minutest fraction of an acre swelled the cost of survey operations considerably, and, with the imposition of charges not originally contemplated and other circumstances beyond its control, has been the cause of the estimates having been so much exceeded.

117. Excess discovered by the Survey.—In reply to a call from the Board of Revenue in 1870, the Superintendent supplied what information he possessed on the subject of the credit due to the survey in bringing to account unassessed areas. At that time, it was shown that taking 2 Rupees per acre as the average assessment of land in the Madras Presidency, an annual increase from this cause had accrued to the assessed area, of the same amount as had up to that date been expended on survey operations.

118. The expenditure had been about Rupees 40,00,000, and the increase discovered by survey of the assessed area was 20,00,000 acres, or a little over 3,000 square miles, the mean percentage of increase being 14.

Present Operations.

119. Coimbatore and Salem.—No. 1 Party is at present engaged on the combined demarcation and survey of the Polachy Taluq and on the demarcation and survey of Mootahs in Salem excluded from operations by the Settlement Department. Colonel Hessey, Deputy Superintendent Revenue Survey is in charge of the party.

120. Kurnool and Bellary.—The Revenue Survey of the Kurnool District having come to a close, surveyors have been for some time past and are still employed on the District and Taluq boundary lines and on a topographical survey of tracts excluded from demarcation. The rest of the field establishment has entered on the Adoni Taluq of the Bellary District, the simultaneous demarcation and survey of which is to be performed on the combined system under the orders of Mr. H. O. C. Cardozo, Deputy Superintendent Revenue Survey.

121. Cuddapah.—No. 3 Party is still employed in the Cuddapah District under Mr. F. C. Puckle. The village boundary survey and field measurement in six out of eleven taluqs in the district have been brought to a close, but no taluq has been returned as complete, taluq boundaries being left undefined, patches of cultivation originally not demarcated being taken in hand, and changes requiring remeasurements being introduced by the Settlement Department.

122. Tinnevelly and Madura.—Work has been commenced on the combined system in the Madura District, and except some topographical surveyors employed in Zemindaries in Tinnevelly, the demarcation of which was undertaken by the survey, the field establishment has been transferred to the Periakolum Taluq of Madura, under the orders of Captain J. G. Cloete, Deputy Superintendent Revenue Survey.

123. Nellore, Chingleput, and North Arcot.—The Revenue survey of the Chingleput District being on the eve of completion, the Arcot Taluq of the adjoining district, North Arcot, was undertaken on the combined system of demarcation and survey early in 1872, under the orders of Mr. W. Beaumont, Deputy Superintendent Revenue Survey.

124. Ganjam.—The Survey of the Berhampore Taluq is nearly closed, and simultaneous demarcation and survey in Goomsoor has commenced under Captain C. D. Baynes, 1st Assistant Superintendent Revenue Survey.

Enclosure No. 2.—Four copies of a list showing Statements to accompany the above report.

Enclosure No. 3.—Copy of letter from Secretary to Government of India, to Government of Madras, dated 13th May 1872, No. 301.

From the same Officer, dated 20th June 1873, No. 1,391-64.

In continuation of my letter, date and number as per margin, I have the honour to enclose a copy of a letter* to the Secretary to Government, in reply to the letter from the Secretary to the Government of India, dated 13th May 1872, No. 301. This ought to have accompanied my letter of the 4th instant.

4th June 1873, No. 1,316-58.

* No. 1,531-45 of 28th July 1873, with enclosures.

2. I take this opportunity of submitting, for the information of the Board of Revenue, a spare copy of G. O., No. 495 of 17th May 1873, and Extract from my letter, No. 1,333-40 of 12th instant, in answer to it.

Paragraph 3 with list.

Extract of a letter from the Superintendent, Revenue Survey, to the Secretary to Government, Revenue Department, dated Camp Ootacamund, 12th June 1873, *No.* 1,333-40, *paragraph* 3.

* * * *

3. I beg to submit a list of maps other than village maps for transmission to the Government of India and also a Memorandum of the probable dates on which district maps on the scale of two miles, = 1 inch will be ready. This Memorandum is, however, merely an estimate. Many unforeseen circumstances may occur to render it incorrect. The refusal of the Supreme Government to sanction an additional Topographical Establishment the estimate for which was submitted pursuant to their own order and the negative to my application for a Manipulator from Southhampton are both drawbacks, on the other hand our having been able in spite of all obstacles to start Photo-Lithography successfully is in favour of the estimate being correct.

Dated 13th May 1872, No. 301.

Pay Rupees 150.

* * *

(True Extract.)
(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

Enclosure No. 1.—Copy of letter from Superintendent of Revenue Survey, to Secretary to Government, Revenue Department, dated 20th July 1872, No. 1,581-45.

Enclosure No. 2.—Copies of correspondence alluded to in the above letter.

Enclosure No. 3.—Copy of G. O., dated 17th May 1873, No. 495, Revenue Department.

From Colonel F. J. B. PRIESTLEY, Superintendent of Revenue Survey, to J. GROSE, Esq., Secretary to the Board of Revenue, dated Chepauk, 9th July 1873, No. 1,600-79.

In continuation of my letter of the 20th June 1873, I have the honour to submit, for the information of the Board of Revenue, a copy of G. O., No. 495 of the 17th May 1873, (calling on me to report what work has been done apart from Revenue Survey work in the way of topography) and four copies of my reply.

No. 1,331-64.

Dated 12th June 1873, No. 1,333-40.

Enclosure No. 1.—Copy of G. O., dated 17th May 1873, No. 495.

Enclosure No. 2.—Four copies of letter from Superintendent of Revenue Survey, to Secretary to Government, Revenue Department, dated 12th June 1873, No. 1,333-40.

From his letter to the Government of India, dated 22nd April 1871, it appears that the Surveyor-General was called on to submit an economical scheme for utilizing, towards the completion of the Map of India, the valuable geographical materials afforded by the Madras Revenue Survey, and for the Topographical Survey of districts yet unsurveyed. Colonel Thuillier

stated that as the Madras Survey is carried out on a proper system, it would be the duty of the Superintendent to generalize and reduce his surveys for the purpose indicated. And he recommended that "some additional Establishment for the purpose of completion, preparation and publication of the result of his survey should be allowed" as it was "desirable that the result obtained should be at once brought into useful form for geographical purposes and the materials incorporated in the new edition of the Sheet Atlas of India." He further suggested that a report be called for from the Superintendent showing the number of districts partially completed, the area already surveyed; also whether he was in a position to commence reduction and compilation of his district maps for geographical purposes, and what additional establishment would be required for the purpose. Acknowledging the heavy duties which devolved on the Revenue Survey, Colonel Thuillier yet thought it would be "true economy to give Colonel Priestley the proper means to bring up some of the heavy arrears of mapping on the smaller scale which forms so great a desideratum after so many years of survey," observing "it rests with the Madras Superintendent to propose what he may deem needful and appropriate." Colonel Thuillier considered that a special officer of the Survey Department should be detailed for "the sole purpose of furthering Geographical Maps * * and working up the survey materials with the necessary numerical data."

2. The Government of Madras had, however, already taken this matter in hand. At the instance of the Board of Revenue (Board's Proceedings, 19th August 1868, No. 5,965), the Government of Madras had sanctioned in G. O., 17th March 1869, No. 729, the measures proposed by the Superintendent for filling up all blanks and completing the District Maps by topographical Survey and with reference to the letter of the Government of Madras to Government of India, dated 8th August 1870, on this subject, Colonel Thuillier stated that the means which were therein described as being then taken to fill up the District Maps were "highly judicious and proper," and he repeated that it would "be money well laid out if the hands of the Superintendent of the Madras Revenue Survey are strengthened so as to make good progress with the four-inches Scale Survey of Zemindari blocks, whereby the Revenue Survey materials so long lying idle may be utilized for geographical purposes and complete District Maps on a tangible scale, rendered."

To Government of India, dated 26th November 1870, No. 533.

3. In reply to these requisitions Colonel Priestley submitted* an estimate for two (2) additional Survey Parties for the topographical Survey of Zemindari and Hill and Jungle tracts not comprised in the Revenue Survey, amounting—with compiling and lithographing establishment for the reduction and mapping of Survey materials—to Rupees 1,07,556 per annum. This estimate was forwarded to the Government of India, under G. O., 22nd February 1872, No. 328, and the reply is the letter now under acknowledgment.

* 6th January 1872, No. 293.

	No.		Rs.
Survey, etc.,	296	... ...	94,500
Compiling, etc.,	86	... ...	13,056
		Total ...	1,07,556

4. The Government of India wish — before sanctioning the proposed increase — that the constitution, etc., of the Madras Revenue Survey Department and its work may be placed fully before them and desire to be informed whether the effective collection and regular transmission of geographical materials for the use of the Surveyor-General's Department cannot be arranged for without further increase of establishment.

5. The points on which the Government of India seek information are:—

(1.) The past and present strength and cost of the establishment, specifying successive increases.

(2.) The work achieved in each class of Survey—revenue (16 inches = 1 mile) and topographical (4 inches 1 mile) and the area of land still remaining to be done in each class and scale.

(3.) The financial results.

6. In respect to the more complete and economical utilization of the Department for Topographical purposes, the Government of India suggest that the large scale now adopted in Madras, viz., 4 inches 1 mile, is not necessary for the topographical survey of *even* cultivated land (not included in the Revenue Survey and Settlement) wherever village boundaries are not delineated—1 inch =1 mile being the usual scale for such surveys elsewhere also that the scale adopted, viz., 2 inch 1 mile, for the Topographical Survey of uncultivated and hill tracts is unnecessarily large, 1 inch 1 —mile being the usual scale elsewhere.

7. The Government of India remark with reference to the proposed Topographical Survey Establishment, that the constitution of Madras Survey parties is unusual in respect :—

(1.) To the proportion of Europeans and Natives, and,

(2.) Unusual number of Native employés.

8. The Government of India farther seek explanation why the Revenue Survey of 34,000 square miles of country has as yet produced so little "geographical materials" and why this has been allowed to fall into arrear; also whether this object of obtaining "geographical material" more rapidly could not be attained either by (1) reduction of the scale adopted for topographical survey, (2) re-distribution of work and of the revenue and topographical branches of the establishment, or (3) by changes in the constitution of parties such as need not disturb the main object of the survey. And they intimate that lithographic maps are not needed for geographical purposes; manuscript materials with the necessary mathematical data only being required for the Atlas of India on a scale of the 4 mile=1 inch and should be supplied *pari passu* with the survey.

9. It may be well to explain *in limine* that the Madras Revenue Survey was undertaken for fiscal purposes only, in connexion with the revision of the Land Revenue wherever the land tax is not permanently fixed. Permanently settled tracts and estates, and all extensive tax-free lands were deliberately excluded from the Survey for economical reasons, together with all extensive hill and forest tracts, which were not likely to be required for cultivation within any early period. It was not until the District Maps began to be made up, that the serious geographical defect forced itself on the attention; and in 1868 measures were taken by the Madras Government to extend the Survey topographically, with a view to complete the District Maps and fill up gaps left in them at the expense of the Survey Department both in money and time. These Supplemental Topographical Surveys are proceeding *pari passu* with the Revenue Survey of districts now in hand and greatly increased importance is attached to them by the department in consequence of the Surveyor-General's having adopted them as sufficient for imperial purposes and incorporation into the Atlas of India. The heavy, but blameless, arrear of ten years Survey operations has however now to be dealt with with all earnestness and is the cause of the present correspondence.

10. *Establishment and cost and successive increment.*—The past and present condition of the Survey Establishment will probably be best traced by giving the precise condition thereof under each head as it stood on the 1st April last, and then tracing the various additions by which it has been brought up to this standard.

——	Number.	Total.	Annual cost.	Total.
Out-door and up-country.			Rs.	Rs.
Survey	2,157	...	4,05,912	...
Demarcation	396	...	89,508	...
		2,553		4,95,420
Add'l Office Establishment	...	396	...	1,34,592
		2,949	...	6,30,012
Head Office.				
Lithographic Establishment	49	...	36,168	...
Draughtsmen	161	...	19,116	...
		210		55,284
Total	...	3,159	...	6,85,296

11. From the accompaning statement A which is abridged in the margin, it appears that the out-door and up country office Establishments consist of 2,949 persons at a cost of Rs. 6,30,012 and includes, it will be observed, the cost of Demarcation in those districts—Madura, Coimbatore, Bellary and Ganjam—where this operation has been undertaken by the Survey Department at a cost of Rs. 89,500. Nineteen officers are comprised in this statement. The establishment at the Head office includes, with Draughtsmen and Lithographic Department, 210 persons at an annual cost of Rs. 55,284, raising the entire establishment and cost of the Department to 3,159 persons and Rupees 6,85,296 respectively.

12. The up-country Survey Establishment is organized in five-and-half Survey Parties which are at present distributed as shown in the margin. Detachments from No. 1 and 4 Parties have been employed in Wynaad (Malabar) and on the Nilgiri Hills.

Number of Party	Districts Surveyed in whole or in part.	None engaged in.
No. 1 Party	South Arcot, Trichinopoly, Salem, and Coimbatore.	Coimbatore.
No. 2 do.	Godavery and Kurnool.	Bellary.
No. 3 do.	Kistna and Cuddapah.	Cuddapah.
No. 4 do.	Madura, Tinnevelly and Coimbatore.	Tinnevelly and Madura.
No. 5 do.	Nellore, Chinglepah and North Arcot.	North Arcot.
No. 6 do. (half party.)	Ganjam.....	Ganjam.

N.B.—Demarcation is being performed by the Survey Department in all districts now in hand except Cuddapah.

13. The marginal Statement shows approximately the average constitution of a Madras Revenue Survey Party as it now stands. There have been occasional modifications in the constitution of each Survey Party with reference to the work to be performed by it; and much well judged latitude is necessarily conceded to the Superintendent for local adaptation. But on the whole the statement fairly represents the constitution of a working Survey Party.

——	Number.	Cost.
		Rs.
Officers	3	2,227
Head Surveyors, etc.	14	1,317
Deputy and detail do	41	1,065
Amins	48	563
Clerks, etc.	68	605
Computers, etc	21	482
Draughtsmen, etc	37	769
Chainmen and other Subordinates	221	1,453
Total...	453	8,480
		12
For one year...	...	1,01,760

N. B.—The above is the average of 5½ Parties now employed.

14. The Madras Revenue Survey broke ground in 1853 on a small, tentative and educational scale under Colonel (then Captain) Priestley with 49 hands of all grades at a cost of Rupees 1,051 per mensem or 12,612 a year. In 1854 two European Assistants were added to the establishment which was further strengthened, so as to comprise three European Officers and 225 hands all told at a cost of Rs. 39,510 per annum.

15. In 1858 the Revenue Settlement and Survey were taken in hand in earnest. The Director of Revenue Settlement was appointed and a Survey Establishment consisting of four Survey Parties was provisionally sanctioned at a cost of Rupees 2,41,920 including the Superintendent's Establishment at the Head office (Rupees 22,560). The progressive organization and formation of the Parties was naturally slow and the gradual inauguration of their Survey operations only raised the actual outlay to Rupees 1,62,156 in 1861.

16. In 1861-62 greatly increased impetus was imparted to the work of the Survey Department, with a view to expedite the Survey of Districts already in hand—especially the Godavery District. The organization of the Survey Parties was somewhat modified and the strength of several was largely increased. Two additional Survey Parties were sanctioned—at a total cost of Rs. 5,39,142 —exclusive of a variety of charges, which have since fallen on this Budget, including Military Pay and Allowances, Medical Assistance, Office rent, etc. The establishment was gradually but steadily brought up till the year 1866-67, when the Survey Establishment became more or less complete according to its present standard. No material change except the necessary modifications and adaptations already noticed—has taken place either in the organization, strength or annual cost of the Survey Department since that date.

17. In 1866 the Survey Department undertook the demarcation—hitherto performed by the Settlement Department—of several districts in addition to their professional work, and this duty—and its cost has been increasingly transferred, thereby bringing up the establishment and expenditure in the Survey Department to their present standard and, as already explained, Topogra-

phical Survey of extensive non-revenue tracts has more recently been added, to the duties of the Professional Department; without however, any sanctioned increase of establishment. It has practically been performed by diverting no inconsiderable part of the Revenual Survey Establishment and expenditure to these more general objects and accounts in some measure for the increasing degree in which the survey lags behind the urgent needs of the Revenue Settlement Department.

18. *Works achieved in each class of survey and still remaining to complete.*—The accompanying Statement B shows the districts to which survey operations have been extended—partially or otherwise—with the dates of breaking ground; the work achieved and that required to complete it. It appears that Survey operations, more or less complete, have been carried on in eighteen districts including the town of Madras, the Taluq of Wynaad (Malabar) and the Neilgherry Hills. The total area comprised in these districts, is 1,07,815 square miles, which may be classed for survey purposes as in the margin. The area is nearly equally divided between Ryotwari land 55,032 square miles, requiring survey on the 16 inch = 1 mile, and Zemindari and hill and forest tracts, 52,783 square miles to be surveyed topographically on the 4 inch = 1 mile or 2 inch = 1 mile scale.

N. B.—Bellary has only just been taken in hand and preliminary demarcation is going on.

——	Square miles.	Per Cent.
For Revenue Survey	55,032	50·9
Do. Topographical Survey.....	52,783	49·1
Total...	1,07,815	...

19. Of the area thus already taken in hand, nearly one-half, 47,813, square miles or 44·3 per cent. has been completed in the proportion shown in the margin. In a survey undertaken entirely for fiscal purposes, attention has, until very recently, been directed solely to Ryotwari land, and 36,385 square miles have been completed being 66·1 per cent. or nearly two-thirds of the whole Ryotwari area to be surveyed to the larger scale. Eleven thousand five hundred (11,428) square miles only of the other classes of land have been completed on the lesser scales since 1868; and there is an arrear of topographical survey to bring up of between 18,000 and 19,000 square miles mainly in those districts where the Revenue Survey is either complete or was far advanced before 1868.

——	Square miles.	Per cent.
Revenue Survey	36,385	76·0
Topographical do.	11,428	24·0
Total...	47,813	...

——	As per Establishment.	Surveyed	Per Cent.
	sq. miles.	sq. miles.	
Revenue Survey.....	55,032	36,385	66·1
Topographical do. ...	52,783	11,428	21·7
Total...	1,07,815	47,813	...

Arrear of Topographical Survey in Districts where the

Revenue Survey is complete.		Revenue Survey is far advanced.	
	Sq. Miles.		
Trichinopoly	734	Ganjam	6,345
Salem	2,952	Wynaad	919
Godavery	2,842	Neilgherries...	600
Kurnool	1,521		
Kristna	1,653		
Tinnevelly	616		
Total...	10,333		
	8,064		8,064
Total...	18,447		

20. The Revenue and Topographical surveys of two (2) Districts, Nellore and Chingleput, are complete. The Revenue Survey of six (6) districts, Trichinopoly, Salem, Godavery, Kurnool, Kristna and Tinnevelly, is likewise complete, leaving however 10,383 Square miles of Topographical Survey to fill up, and of three Districts, Ganjam, Wynaad, and Neilgherry, the Revenue Survey (comprising 1,474 square miles) is far advanced, leaving however 8,000 square miles of Topographical Survey to bring up. To overtake this arrear, additional strength is indispensable and the expenditure will prove real economy.

Proceedings of the Madras Government, Revenue Department,
11th May 1374.

—	Sq. Miles.	Per cent.
Revenue Survey	18,647	31·0
Topographical do.	41,355	69·0
	60,003	

N. B.—The average for the last 6 years has been little above 6,000 square miles a year, in consequence of so many detached and special surveys having been required.

21. To complete the districts already in hand, there remain 60,000 Square miles to survey, distributed as per margin. The greater part by far, viz., 41,355 Square miles, awaits Topographical Survey, only 18,647 Square miles will require to be surveyed on the 16 inch = 1 mile scale.

22. The average annual outturn of work during the last twelve years (1861-72 both inclusive) was about 3,417 Square miles, ⅔ being Revenue Survey, at which rate it will occupy five-and-half years to complete the Revenue Survey of tax-paying land (18,647 square miles). If the time occupied by demarcation be added, say one-and-a half year. Seven (7) years may be reckoned on as the period within which the Revenue Survey of these districts will be completed by the present Establishment. The Topographical Survey of 41,000 Square miles may be completed, were the existing establishment exclusively employed on it at the rate of 10,000 square miles in each year or say in four years. Thus *eleven* years may be taken as the period within which the remainder of the districts now in hand can be finished with the same establishment and annual expenditure. But it is to be hoped that increased liberality will enable earlier completion especially of the topographical part of the arrears without further interference with the very important claims of the Revenue Survey.

23. Great differences have marked the rate at which work has been turned out in different years as will be observed from the statement given in paragraph 26. It has risen as high as 4,900 Square miles and fallen as low as 2,264 in the year. This inequality is mainly due to the casual and partial transfers which special Survey, such as the Wynaad, Nellambur, Neilgherry hills, Ganjam and the like, have necessitated, to the serious delay of more regular work of the Revenue Survey Department. These special calls are now restricted and the averages taken are likely to cover prospective delays and obstructions, if reasonable economy be observed.

24. As regards the scales on which Topographical Survey is now conducted, a 4 in. = 1 mile scale is adopted in inhabited and open country, and 2 in. = 1 mile amongst hills and forests. Of the latter, about 1,100 square miles have been done, the rest of the Topographical Survey, about 10,000 square miles, is on the larger scale of 4 in. = 1 mile. Village boundaries are not delineated in the Topographical maps, but District and Taluq boundaries are carefully settled in the course of the inquiry, involving the decision of many disputes, and delineated and demarcated.

25. Before leaving this part of the subject, it may be well to notice that several districts of the Presidency are not included in the above statement, as no steps have been taken, or probably will be taken, to bring them under Survey at any early date. The area of these districts for Revenue Survey may be roughly estimated at 13,500 square miles and 4,303 square miles for Topographical Survey. The former area may be diminished by probably 3,000 square miles by substituting Topographical Survey of the Hill and wild tracts of Malabar and Canara; leaving 10,000 square miles for Revenue and 8,000 square miles for Topographical Survey.

Estimated Area.

Districts.	Revenue.	Topographical.
	Sq. Miles.	Sq. Miles.
Tanjore	3,735	.....
Vizagapatam (proper)	1,000	*4,303
Malabar	†1,843	.....
Canara	3,902	.....
Total...	13,479	4,303

* Exclusive of Wynaad.
† N. B.—Jeypore is being Topographically Surveyed by the Surveyor-General Department.

26. *Financial Results.*—The financial results of the Survey Department for each year since the commencement are shown in the margin in juxta position with the work performed. As above shown nearly 48,000 Square miles including 11,428 Square miles topographically surveyed, have been completed at a cost of 62 lakhs of Rupees or about Rupees 130 per Square mile all told.

Years.	Area in Sq. miles.	Expenditure.	Cost per Sq. mile.
		Rs. A. P.	Rs. A. P.
Up to December 1857	1,259	1,21,523 7 9	96 12 2
,, 1858	690	63,565 0 0	93 0 7
,, 1859	1,562	1,47,186 7 2	94 3 9
,, 1860	3,383	2,77,194 13 1	81 15 0
,, 1861	4,260	4,07,503 15 11	95 10 6
,, 1862	4,903	3,89,618 10 6	79 7 8
,, 1863	4,764	4,16,665 4 10	87 7 4
,, 1864	3,348	4,38,835 8 0	136 1 2
,, 1865	2,956	4,35,213 9 8	147 3 11
,, 1866	2,720	4,78,961 11 2	176 1 4
,, 1867	2,687	5,04,709 6 1	187 13 8
8 Months 1868	389	1,24,631 5 8	320 4 3
1868-1869	2,664	5,99,556 6 10	225 1 2
1869-1870	3,517	4,61,202 11 8	131 3 2
1870-1871	3,573	4,88,261 15 1	136 7 1
1871-1872	3,132	5,53,851 6 7	176 14 4
Up to December 1872	2,199	4,14,816 2 4	166 0 1
	47,990	62,15,530 14 4	129 13 2
Deduct the difference between the estimate and actually incurred measurement allowance	.....	59,737 8 4	... ...
Total..	47,990	61,55,793 6 0	128 8 2

Years. Up to December 1857 ..... 1,259 1,21,523 7 9 96 12 2
,, 1858 ..... 690 63,565 0 0 93 0 7
,, 1859 ..... 1,562 1,47,186 7 2 94 3 9
,, 1860 ..... 3,383 2,77,194 13 1 81 15 0
,, 1861 ..... 4,260 4,07,503 15 11 95 10 6
,, 1862 ..... 4,903 3,89,618 10 6 79 7 8
,, 1863 ..... 4,764 4,16,665 4 10 87 7 4
,, 1864 ..... 3,348 4,38,835 8 0 136 1 2
,, 1865 ..... 2,956 4,35,213 9 8 147 3 11
,, 1866 ..... 2,720 4,78,961 11 2 176 1 4
,, 1867 ..... 2,687 5,04,709 6 1 187 13 8
8 Months 1868 ..... 389 1,24,631 5 8 320 4 3
1868-1869 ..... 2,664 5,99,556 6 10 225 1 2
1869-1870 ..... 3,517 4,61,202 11 8 131 3 2
1870-1871 ..... 3,573 4,88,261 15 1 136 7 1
1871-1872 ..... 3,132 5,53,851 6 7 176 14 4
Up to December 1872 ..... 2,199 4,14,816 2 4 166 0 1
47,990 62,15,530 14 4 129 13 2
Deduct the difference between the estimate and actually incurred measurement allowance .... 59,737 8 4 ... ...
Total.. 47,990 61,55,793 6 0 128 8 2

27. It will be observed that considerable fluctuation has characterized the mileage cost of the Survey from year to year. In the early years of more imperfect and less expensive work, several charges now thrown on this budget *e. g.* Military pay and allowance etc. were borne by other Departments and in other respects the present more costly efficiency had not been reached The subsequent rise is due to greater efficiency but also in a very larger degree to the cost of such detached and special surveys at Wynaad, the Neilgherry hills, Ganjam, etc., the cost of which is shown by the following classified statement to be out of all proportion to the ordinary work of the Department. The causes admit of easy explanation.

Items.	Sq. Miles.	Total cost.	Cost per Sq. mile.
			Rs. A. P.
Revenue Survey 16 inch=1 mile	36,111	55,37,012	153 5 3
Topographical Survey 4 and 2 inch=1 mile	11,340	2,31,613	20 6 9
	47,451	57,68,625	121 9 1
Special Surveys on 16 and 4 inch =1 mile scale ..	362	5,68,381	1,570 1 10
Total ..	47,813	63,37,006	132 8 7

28. These special drains on the resources of the Department are, however, nearly complete and a tendency towards more economical Departmental management is manifest. And the Board learn that the Revenue Survey of parts of the Chingleput District, a difficult district with minute Sub-divisions of property, is now rapidly progressing at a cost somewhat under Rupees 100 per square mile.

Revenue—	Rs. A. P.
16 in = 1 mile	130 0 0
Topographical—	
4 in = 1 mile	26 12 0
2 in = 1 mile	17 0 0
Sq. Miles.	Rs.
18,647 at 130 Rupees.....	24,24,110
41,855 at 17 Rupees.....	7,03,035
Total...	31,27,145
Add 10 per cent. for contingencies.....	3,12,714
Total...	34,39,859

Statement of area demarcated and cost incurred annually.

Years.	Area demarcated in Sq. miles.	Expenditure.	Cost per Sq. Miles.
		Rs. A. P.	Rs. A. P.
1866	307	61,153 5 0	199 3 1
1867	1,135	84,316 15 7	74 4 7
8 months 1868	114	24,690 10 8	216 9 4
1868-69	988	1,53,259 6 2	155 2 5
1869-70	1,055	1,35,989 13 3	128 14 5
1870-71	2,373	1,15,429 4 9	48 10 7
1871-73	2,050	1,08,062 7 1	52 11 5
9 months 1872	840	71,654 11 8	85 5 5
Total...	8,861	7,54,607 9 9	85 2 7

—	Sq. Miles.	Cost.
		Rs
1870-71	2,373	1,15,420
1871-73	2,050	1,08,062
9 months of 1872	840	71,655
Total...	5,269	2,95,167

Average per square mile Rupees 56-1-6.

29. In a recent Statement prepared with reference to carefully collected data, the Superintendent has estimated the cost, including proportion of Head Office charge and lithography of each class of Survey at the rates shown marginally. At these rates the work yet to be performed in districts already in hand will amount to say 35 lakhs.

30. As above noticed the demarcation of land for Survey and Settlement purposes has been increasingly transferred from the Settlement, to the Survey Department ; and in most of the districts now in hand, this operation is combined with the professional Survey and being conducted *pari passu*. Since 1866, 8,861 Square miles have been demarcated by the Survey Department and at the expense of this Budget at a cost of Rupees 7,54,608 (Rupees 1,89,774 being the cost of material) or Rupees 85-2-7 per square mile, exclusive of the cost to the cultivators, being the contribution of the Ryots in material (field-stones,) and labour.

31. Many causes co-operated to raise the cost of this operation somewhat unduly in early years. The average of the last three working years shown in the margin, indicates, however, that the Superintendent's estimate of Rupees 58-8-0 per square mile is not over large.

32. At the above rate the cost of demarcating 18,647 Square miles yet to be surveyed, on 16 in = 1 mile scale will amount to say 11 lakhs (Rupees 10,90,849) and the demarcation of the boundaries of Estates and Forests in the course of Topographical Survey would probably add Rupees 1-12-0 per Square mile to the cost of Topographical Survey. Thus the cost of surveying and efficiently demarcating the area, Revenue and Topographical, yet awaiting survey in the districts already in hand will amount to more or less 46 lakhs of Rupees.

Survey as per paragraph 29		34,39,859
Demarcation.		
18,647 square miles Revenue	at Rs. 58-8-0	10,90,849
41,855 square miles topographical at Rs.	1-12-0	72,371
		46,03,079

33. *Suggestion on Topographical Survey, etc.*—The latter portion of the letter of the Government of India relates to the more rapid preparation of the requisite "Geographical Material" and an explanation is sought of the paucity of these materials and of the arrear of Topographical Survey as compared with the area already surveyed on the larger scale.

34. The accumulation of this arrear of Topographical Survey is not, as already explained, due to Colonel Priestley, but to the strictly fiscal and economical basis on which the survey was commenced. The very natural and proper determination to utilize it for geographical purposes also was more or less an after-thought, and since it was adopted by the Madras Government in 1868, Topographical Survey has received considerable development, despite the very urgent demands of the Revenue Settlement, which has been proceeding *pari passu* with, indeed has unfortunately much outrun, the survey. It is freely admitted on all hands that Topographical Survey

sought now to receive unremitting attention with a view to the completion of the District Maps and the Atlas of India, and it was with this view that the application to which the letter of the Government of India under notice is a reply was made. But the Board think with Colonel Priestley that special arrangements are needed and should be made forthwith and that additional funds should be sanctioned to enable the Department at all events to bring up rapidly the arrears of Topographical Survey still remaining to complete districts, where the Revenue Survey has already been done or is already far advanced. The Topographical Survey of those districts, which are now being surveyed for revenue purposes, must await the lower processes of the Revenue Survey with which it progresses *pari passu*, but there is no reason why the arrears should not be taken.

35. It is obvious to remark that nothing ought to be allowed to retard or throw back the Revenue Survey, as has of late years been too much the case in consequence of numerous special calls on the Department and increased attention to Topographical Survey. The Land Revenue Settlement is dependent on the operations of the survey and has already been seriously hampered and thrown back by the burden lying on the Department which supplies the maps and correct areas on which to base re-settlement of the Land Revenue. As it is, the Revenue Survey is slow and costly and any avoidable obstruction causes such serious loss of revenue and such notable and costly loss of time and money in the Settlement Department, that no risk can be incurred. The present Survey Establishment is fully employed with the Revenue Survey and cannot be spared to bring up rapidly the arrears complained of by the Surveyor-General. The increase now sought should be admitted in consideration of the large public interests involved.

36. The Board agree with Colonel Priestley that the requisite special arrangements for bringing up the Topographical Survey can only be carried out economically and efficiently under the superintendence of Colonel Priestley, and by his already trained and experienced Assistants. They know the country, which they are already engaged in Surveying, and they are familiar with the people and language. The organization of any increased establishment and the expenditure of any money sanctioned with this view, should be entrusted to the existing Department. The Board would therefore support the application made in G. O., dated 22nd February 1872, No. 323, to the extent of at least one additional Survey Party to be employed under Colonel Priestley exclusively in bringing up arrears, at a cost of say Rupees 50,000 a year.

37. As regards the suggestions made by the Government of India, having in view this needful expedition by reduction of the scale on which Topographical Survey is now performed. The Board would remark that neither demarcation nor delineation of village boundaries accompanies Topographical Survey, and they see no cogent reason why—since it appears that the Surveyor-General would be satisfied with the smaller scale—the 2 inch = 1 mile should not be adopted for all Topographical purposes. It is much more expeditious and somewhat less costly than survey on the 4 inches = 1 mile scale. The Board therefore recommended that a scale of 2 inches = 1 mile be adopted for all Topographical survey.

38. The Government of India make some remarks on the constitution of the Madras Survey Party and the comparatively liberal employment of natives on sundry work. The Board do not think that any serious or sudden alteration in the organization of a service already nearly twenty years in the field, could be made without seriously hampering operations and causing great dissatisfaction and discontent amongst a very numerous body of men, many of whom count long service. And they think that officers so experienced and successful as Colonel Priestley and his Assistants may well be left to adopt such Departmental and personal arrangements as experience has taught them are most effectual and economical. The natives of this Presidency make, under good supervision, admirable Surveyors, and the Board would be unwilling to deprive these intelligent races of this congenial employment in the service of the State.

39. The Board think that Colonel Priestley has in his letter, dated 20th July 1872, shown conclusively that the Lithographical establishment is indispensable for the work of this Presidency. It must therefore be continued in order that the Topographical Survey may be made available for the completion of the District maps.

A.—*Statement showing the cost of the Survey Demarcation and Central Office Establishments of the Department at the close of the last year* (1872.)

Out-door or Survey and Demarcation and Office Establishment.			In-door or Office, Draughtsmen, etc., etc., Establishment.		
Designation.	No.	Annual salary.	Designation.	No.	Annual salary.
		Rs.			Rs.
Survey.			*Head Office.*		
Officers	11	76,212	Superintendent	1	21,936
Sub-Assistant and Surveyors.	304	1,57,080	Office Assistants	2	4,800
Ameens (Field Surveyors) ...	641	79,236	Clerks and Computers ...	19	4,092
Gumastahs	1,201	93,384	Draughtsmen	13	4,140
			Servants	14	1,200
Total...	2,157	4,05,912	Total...	49	36,168
Demarcation.			*Lithographic Department.*		
Officers	3	23,076	Head Draughtsman	1	1,800
Inspectors	10	7,440	Draughtsmen	80	11,004
Demarcators	198	46,200	Printers and Servants	80	6,312
Servants	185	12,792			
Total...	396	89,508	Total...	161	19,116
District Offices.			Any other Establishment without too great detail	...	...
Officers	5	40,020			
Writers and Computers ...	119	33,576			
Draughtsmen	200	55,476			
Servants	72	5,520			
Total...	396	1,34,592			

Abstract.

	No.	Annual salary. Rs.
Survey	2,157	4,05,912
Demarcation	396	89,503
District Office	396	1,34,592
Head Office	49	36,168
Lithographic Department ...	161	19,116
Other Establishment		...
Total...	3,159	6,85,296

(Signed) F. J. B. PRIESTLEY,
Supt. of Revenue Survey.

Chepauk,
10th July 1873.

B.—*Statement showing distribution of Out-door Survey Department and Work achived and to be done in each District on the 31st December 1872.*

Name of District.	Number of Party.	Date of commencement.	Area for		Surveyed.		Total area.	To complete.		Total area.
			Revenue Survey.	Topographical Survey.	Revenue Survey.	Topographical Survey.		Revenue Survey.	Topographical Survey.	
			Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.	Sq. miles.
South Arcot	Tentative Survey Party and No. 1 Party.	May 1856	2,814	2,059	514	...	4,873	2,300	2,059	4,359
Trichinopoly	No. 1	February 1856 ...	2,601	982	2,691	218	3,673	...	734	734
Salem	Do.	June 1859	3,606	3,877	3,606	925	7,483	...	2,952	2,952
Coimbatore	Nos. 1 and 4 ...	Do. 1861	5,329	2,163	3,594	51	7,432	1,735	2,052	3,787
Godavery	No. 2	March 1858	2,874	3,350	2,874	518	6,224	...	2,832	2,832
Kurnool	Do.	June 1862	5,110	2,243	5,110	657	7,358	...	1,591	1,591
Bellary	Do.	December 1872 ...	7,147	3,860	...	...	11,007	7,147	3,860	11,007
Kistna	No. 3	January 1859 ...	5,296	2,740	5,296	1,082	8,036	2,200	1,658	1,658
Cuddapah	Do.	June 1865	4,652	3,715	2,452	432	8,367	2,200	3,283	5,483
Tinnevelly	No. 4	July 1863	2,810	2,366	2,810	1,750	5,176	...	616	616
Madura	Do.	June 1872	2,277	7,225	90	90	9,502	2,187	7,225	9,412
Nellore	No. 5	March 1861	4,213	4,249	4,213	...	8,462	...	...	...
Chingleput	Do.	January 1867 ...	2,093	741	2,093	741	2,834	...	...	...
North Arcot	Do.	April 1872	2,619	4,520	19	91	2,739	2,600	4,429	7,029
Ganjam	No. 6	September 1866 ...	1,172	7,141	772	596	8,313	400	6,545	6,945
Wynaad (Malabar) ...	Nos. 4 and 1 ...	October 1859 ...	236	924	186	5	1,160	50	919	969
Nilgiris	No. 1 Detachment.	February 1866 ...	66	683	38	83	749	28	600	623
Madras Town	.....	.....	27	...	27	...	27	...	...	...
Total...	.....	.....	55,032	52,783	36,385	11,428	1,07,815	18,647	41,355	60,002

Read the following papers:—

No. 156 From G. BANBURY, Esq., Director of Revenue Settlement, to the Hon. R. A. DALYELL, Acting Secretary to Government, Revenue Department, Octacamund, dated Madras, 14th October 1873, No. 2,274-57.

In accordance with the orders* of Government, dated 20th May 1872, which were communicated to me by Colonel Priestley on the 4th of June last, together with his report upon the past and future working of the survey, I have the honour to offer the following remarks.

*At foot of Mr. Under-Secretary Geoghegan's letter to Madras Government, dated 15th May 1872.

2. *Past Working—Former Paymaish.*—If this is intended to embrace *Native* Revenue officers, the narrative is, I think, here hardly correct, as the Native servants, such as Karkons, Revenue Inspectors, Sampraties, and Peshkars, were, as a rule, able to hold their own with the Curnums, and successfully conducted both examinations of concealed cultivation and settlement of disputes without any great difficulty.

In paragraph 2 of the report on the history of the department, Colonel Priestley writes: "In every case, the Revenue authorities were completely at the mercy of the Curnum, who interpreted the Paymaish records as they thought fit."

3. *Hill Demarcation.*—It must be remembered that this task of hill and boundary demarcation was not undertaken until the receipt of Government orders, dated 3rd September 1865, by which time our employés had completed the districts referred to and passed on elsewhere. I give the accompanying extract from a letter from Mr. Master, my predecessor, to Colonel Priestley upon this subject, which explains all clearly enough.

In paragraph 37, Colonel Priestley writes that "the line dividing Nellore from Kurnool and Kistna has been demarcated by the Survey, the Settlement Department having declined to undertake the duty. The long delay in settling and defining the boundary line between this district and Cuddapah has hitherto stood in the way of the completion of the district map of Nellore."

Letter to Superintendent of Survey, 21th June 1869, No. 845.

"The demarcation of the Kurnool District has been completed according to the hitherto existing rules, and to the full extent required for revenue or settlement purposes. What is now required to be done has no connection with the revenue or the settlement, but is purely for survey purposes, in order that topographical details may be filled in, in the gaps of the district maps, and the latter made perfect. This being so, and the demarcation generally having been transferred to the Survey Department, which department must be far the best judges of the kind and extent of demarcation necessary for the execution of the topographical work required, and consequently must be best able to perform it, I consider that the task naturally and appropriately falls to that department, aided, if necessary, by the local officers."

As regards the long delay in settling the boundary line between Nellore and Cuddapah, the numerous intricate and hitherto quiescent disputes, which sprang into existence upon our beginning to mark out the correct limits, were the main cause of delay. In fact, it took Mr. Baber, an energetic young officer, with powers under the Act, about four months to settle five of these disputes. But now progress

of survey on this line has been arrested by an injunction from the Civil Court, owing to a suit having been filed by the losing parties in an important boundary case settled by this department. This delay has thus been unavoidable, and I apprehend the same causes have militated against the definition of boundaries in the Survey Department, as I do not hear of the map of any one district having been entirely completed.

4. *Demarcation by Settlement Department.*—This is, I think, for the following reasons hardly fairly put. Survey operations in the Godavery, Kistna, and Trichinopoly, all demarcated by this department, went on more rapidly and were completed in a shorter time than in Ganjam and Coimbatore Districts demarcated by the survey themselves. Colonel Priestley has not only borne testimony officially to the goodness of the work, but requested us to undertake demarcation in Bellary after this task had been formally transferred to his department. Such could hardly have been the case had our demarcation been "unsuited to survey requirements." In a word, if the settlement demarcation had been so bad as this, the survey, which was based thereon, could not possibly have been so wonderfully good as it is. I am not for a moment wishing to uphold the earthen mound demarcation of past days against the permanent stone demarcation of the present; but the former certainly answered its purpose as a basis for the survey to work upon at a time when the cost of more permanent marks would have been objected to, the benefits thereof not then being so fully recognized as now.

Paragraph 57. "The demarcation (by the Settlement Department) was from the first found unsuited to survey requirements."

Letter to Director, 4th August 1869, No. 1,729.

5. *Minor Holdings in Survey Fields.*—Any one unacquainted with the subject would think from this that the existence of these minor holdings in survey fields was of somewhat rare occurrence, whereas, in truth, they are so numerous that their measurement, the calculation of their areas, and their correct entry in our registers is a most laborious and important task. Thus, last year we dealt, as above explained, with no less than 136,760; of these minor properties in 45,679 survey fields. During the year previous, the figures stood at 111,327 and 38,471, respectively.

Paragraph 111. "Fields included within survey fields are, where they exist, measured by the Settlement Department after survey operations have been closed."

6. *Measurement of Minor Holdings as formerly conducted.*—Some error has crept in here, for I well remember, as Deputy-Director, having charge of this branch of work in 1858, and being aided in its execution by Colonel Hessey, then Deputy-Superintendent of Survey. Mr. Puckle, my successor, also carried on the task in Trichinopoly. Unless I am much mistaken, the survey undertook the work in part of Salem and part of Trichinopoly and retained charge thereof for about a year or so.

Paragraph 112. "In all districts first taken up for survey the measurement of interstitial fields was performed by the Survey Department."

7. *Excess discovered by Survey.*—As far as can be gathered from the annual reports, the expenditure, excluding cost of boundary pillars up to the end of 1870, comes to about Rupees 55,00,000, and as it is not, in reality, practicable to clo[illegible] with new assessment anything like the entire area brought to light by survey, these results as to gain by survey can hardly be accepted. Thus I lately, in my report on Tanjore, explained that in the case of wet lands the old assessment was fixed upon what is termed a "Karay," or well-defined limit, and that as the demand thus fixed was as much as this block could possibly pay, no amount of surveying could enable us to derive more revenue therefrom. The same with dry lands. In many parts of Salem, although during the settlement the average of the new rates based upon the survey areas was frequently lower than that of the rates formerly paid, it was, nevertheless, found that the former would be oppressive; as by charging the excess area, which had alone enabled the holders to carry on, the assessment would have been more than the land could bear, or, in other words, they could afford to pay Rupees 1-6-0 for the old nominal acre, which was, in reality, an acre and three-quarters, but could not afford to pay Rupees 1-4-0 for the exact acre, and nothing more. Again, the survey increase falls, as a rule, more upon the poor outlying lands than upon the rich home-fields; and more upon the inferior than the superior villages. I noticed the latter feature particularly in the case of the Pattikondah Taluq, the last I settled. It will be seen from the following figures that in this taluq the increase on the rich Renad or black cotton soil villages is but little, but that the excess by survey appertains to the poorer red soil tracts:—

Paragraph 117. "In reply to a call from the Board of Revenue in 1870, the Superintendent supplied what information he possessed on the subject of the credit due to the survey in bringing to account unassessed areas. At that time, it was shown that, taking 2 Rupees per acre as the average assessment of land in the Madras Presidency, an annual increase from this cause had accrued to the assessed area of the same amount as had up to that date been expended on survey operations."

Paragraph 118. "The expenditure had been about Rupees 40,00,000, and the increase discovered by survey of the assessed area was 2,000,000 acres, or a little over 3,000 square miles, the mean percentage of increase being 14."

Groups.	Area as per Revenue Accounts of Fasli 1282.	Area as per new Settlement.	Difference.	Percentage.
1	2	3	4	5
1st Group...	41,790	42,498	+ 708	+ 1·69
2nd do.	1,17,805	1,26,220	+ 8,415	+ 7·14
3rd do.	86,320	95,097	+ 8,777	+ 10·17
Total...	2,45,915	2,63,815	+ 17,900	+ 7·23

8. *Future Working.*—My remarks upon the second portion of this subject, which refers to certain modifications proposed to be made in the mode of conducting the survey, must necessarily be brief, and be put forward with some hesitation, as they relate to the working of a separate department.

9. The first of the two main modifications placed before the Madras Government is the following:—

"Whether the scale upon which the topographical details are conducted in cultivated tracts amidst ryotwari lands might not be reduced from 4 inches to 1 inch to the mile."

This question is, it appears to me, connected with that of the detail or topographical survey of lands in Government villages, which is now conducted on a scale of 16 inches to the mile for the village maps, and then reduced first to 2 inches, and subsequently to 1 in[illegible] for the taluq maps. If the 1 inch scale is to be adopted as suggested by the Government of India for "cultivated tracts," this standard would, I presume, extend also to the details in ryotwari villages, so that the whole of the topographical work of the taluq would be laid down by plane table at this scale of 1 inch to the mile, and the village details would thus no longer be represented in the 16-inch maps. If any great saving in cost were likely to ensue by this mode of conducting work, it would, no doubt, be well worthy of consideration; but, as far as I understand, the cost of plane tabling at 1 inch and of detailing at 16 inches as now carried on upon the village maps is very much the same,—about 9 Rupees the square mile for field-work in either instance. Similarly as regards office-work, the cost of reducing from the 16 to the 1 inch scale is not greater than the cost involved in plotting the plane table squares in the first instance for the use of the surveyor in the field, and then completing them when returned by him to Office. Very probably by Colonel Priestley's new process the cost of reducing the village details from the larger to the smaller scale is even less than I have supposed it to be. If such be really the state of affairs, it would be certainly bad policy for us to lose these details from the village maps.

10. I must, however, admit that I can hardly agree with Colonel Priestley in deeming the inclusion of these details in the village maps to be absolutely necessary, in order to enable the Revenue-officers to find the fields, nor in thinking that half the day would be wasted in this search were these aids not forthcoming. Where the demarcation is good, the field wanted is soon found with the aid of the Land Register, which gives the name of each occupant. The Monigar or Carnam can also at once point out his own, or the Pagoda Inam, and there is a starting point gained in five or ten minutes. Again, there is always a theodolite station not far off to start from, and the khundum lines are sure and safe guides. As examples of the foregoing, it may be mentioned that, under the combined system of classification and demarcation carried on by this department, the former operation is conducted upon the plain field sketch; that in the Perinthorny Taluq we classified each field upon rough sketches; and that the topographical details are not given in the maps we are about to use for classification in Palladam and Bowany. Moreover, it must be borne in mind that these maps are, for the most part used by those who have some knowledge of their duties, and to whom, in fact, after the old paymaish, even these rough sketches are a treat and a luxury. Still, as I have already said, if these topographical details as now furnished cost no more than plane tabling upon the 1-inch scale, I would certainly advocate their retention as with them the maps look complete and business-like; without them blank and unfinished.

11. However, let this question be decided as it may, I would certainly advocate that both field and detail work should be carried on as hitherto under

Colonel Priestley's superintendence; otherwise the outlay will be enhanced and complications to the detriment of good progress and good feeling will most likely very speedily arise. It must be also remembered that Colonel Priestley's officers are well acquainted with the people with whom they have to deal and with the country in which they have to w[illegible]nd thus know well how to overcome local difficulties and how to take full a[illegible]tage of local facilities. Moreover, no one has ever urged that the work performed by the Madras Survey is of an inferior description; the usual complaint has been that it is too good.

12. Finally, with regard to this question, might it not be practicable for Colonel Priestley to experiment upon the 1-inch scale as well when making the trial as promised on the 2-inch for these cultivated tracts. If the 1-inch can be worked upon, it would fit at once into the taluq map, and this scale is ample for showing the boundaries of villages, rivers, hills, and other important geographical details. Moreover, as the 16-inch topographical work can, I imagine, be now reduced to 1 inch by a single operation, there is perhaps no longer the same necessity for this intermediate stage of 2 inches.

Letter to Government, dated 20th July 1872, No. 1,581-45, paragraph 11.

13. The second proposal for the consideration of the Madras Government is "whether the topographical details as to uncultivated tracts cannot be surveyed at 1 inch to the mile instead of 2."

As these details are mainly required for filling in gaps in the maps, I do not see why the 1-inch scale should not be adopted, and the whole fitted into the taluq map now drawn to this standard. Might not Colonel Priestley, therefore, give this standard a trial in uncultivated, hilly, and jungly ranges, as he is already prepared to do with the 2-inch sca[illegible] cultivated tracts? The present taluq maps at 1 inch show all we requ[illegible]be delineated, and if the work were done throughout upon this scale of 1 inch in the first instance, the task of reducing for the district map at four miles to the inch would, I apprehend, be simplified, as there would be only one reduction instead of two as under the present system.

14. In connection with this subject comes the question of the necessity for regular and systematic demarcation in jungle tracts on hill tops far distant from any habitations, and in Zemindari estates. It may be said with regard to the first and second cases that when the taluq or district boundary line has to be defined, jungle and distance must not stand in the way; but there must be many tracts where this definition is quite unnecessary, as tigers and other wild beasts are the only residents, and they certainly need no consideration under this head. In such cases, might not the necessary details be obtained from the Ordnance maps? With regard to the third point as to the demarcation in Zemindari estates, it would appear that, as purely topographical survey is now evidently advocated, there is no necessity hereafter for regularly demarcating roads, railways, canals, etc., which could be laid down by plane table with the aid of occasional stones required for the points of intersection.

15. Finally, as to the large number of Natives retained by Colonel Priestley as noticed in paragraph 2 of the Under-Secretary's letter. The reasons for this are, I take it, economy, facility of management, and patience under instruction.

Natives will be content with less salary, are, as a rule, most amenable to orders, and will remain on quite contentedly with a low rate of wages, thoroughly training themselves for the higher grades, with the hope of eventually succeeding thereto. As far as I can judge, Colonel Priestley has an able staff of Native subordinates, and had he found the work better under other agency, he would doubtless have more largely resorted .

No. 137. ORDER THEREON, 11th May 1874, No. 584.

Miscellaneous.

ORDERED that the above Proceedings of the Board of Revenue be forwarded to the Government of India, with the intimation that this Government support the proposal made by the Board of Revenue that sanction should be accorded for the entertainment of at least one additional Survey Party to be employed under Colonel Priestley exclusively in bringing up arrears, at a cost of, say, Rs. 50,000 a-year, and that a scale of 2 inches = 1 mile should be adopted for all topographical survey.

2. The Government further consider it essential that the addition to the Central Office asked for in Colonel Priestley's letter, dated 6th January 1872, No. 20-3 (G. O., 22nd February 1872, No. 328, Revenue Department) should be allowed for the purpose of expediting the compilation and lithographing of the maps embodying the topographical details. As there are so many arrears to bring up, His Excellency the Governor in Council thinks that the full amount should be sanctioned, but, as soon as it can be managed, the extra establishment estimated at Rs. 1,033 per mens[illegible]y be reduced.

Extract.)

(Signed) C. G. MASTER,
Acting Secretary to Government.

To the Board of Revenue.
,, the Director of Revenue Settlement.
,, the Superintendent of Revenue Survey.

Ed. F. B Pauleman.

No. 361

From

J. Strachey Esq

Under Secretary to the Government of India,
Department of Agriculture,
Revenue and Commerce.

To

The Chief Secretary to Government of
Madras.

Calcutta Dated 13th May 1872.

Sir,

Strachey—

I am directed to acknowledge the receipt of your letters No. 1728 and 329 dy. respectively the 31st October 1871 and 22 February 1872 in the former forwarding for the consideration of the Government of India a scheme for the establishment in Madras with a view to the special attainment of certain Geographical materials.

2. Before sanctioning any additional expenditure in this account the Governor General in Council desires to learn from the Government of Madras a complete account of the survey establishments of the Southern Presidency in much fuller detail than the papers now before him contain, and also full materials for the account which the Government of India will be required to render of the operations of the establishments which first took the field, the results obtained

of any, the work performed, and the total financial results.

3. In connexion with this subject I am desired by the Committee of this Institution to forward to you the following points.

(a). The topographical survey of cultivated lands situated amidst by Native land has in Canada been conducted on the scale of four inches to the mile. In Northern India such a scale has only been found necessary for cadastral & village boundaries. Where these are not laid down a scale of one inch to the mile has been found sufficient. It is desired whether the delineation of village boundaries is in each case necessary, and if not in what cases, whether the scale of survey might not be reduced.

(b). Immediately East & Geographically bounding on this scale of 2 inches to the mile. It appears to the Committee desirable that the value of a survey of such ground as that should be ascertained. In Northern India this scale of survey has been adopted very doubtful whether on such a scale can not only this but also the

(c). The distinction between the number of

two parties proposed by Col. Priestley in my letter for the two topographical parties he asks permission to entertain 6 European Officers and 62 native Surveyors and Assistants. Other thousand pounds in the Bengal Budget to insure a correct delineation of ground as difficult to survey by means of Native Assistants has appeared - and the number of parties employed by Col. Priestley for two parties is equal to the total number of European and native Officers of the same classes in the whole Great Topographical Survey parties under the control of the Survey General of India.

4. Set apart from the question of the survey parties and the scale to which the survey should be executed, the Surveyor General of India thinks that some further explanation is necessary as to why a survey which has occupied upwards of 34,000 square miles of country should have produced so little topographical material. The figures given by the Government of Madras are sufficient to explain this, but they do not show the proportion of the area fully surveyed to the remaining to be taken up. Before sanctioning an addition to the existing strength of the survey the Surveyor General would wish to

of an attained by a redistribution of the work. For a just opinion upon this point data are, however altogether wanting.

3–5. A part of the proposition before the Govt. of India relates to the entertainment of an establishment of compilers in the office, costing Rs. 3000 per annum. The sum is not large, but the Government cannot be assured [illegible] whether Col. Thuillier has fully apprehended the way in which [illegible] desired to utilize the results of the survey for geographical purposes. The establishment includes a Lithographic branch. What is chiefly needed for geographical purposes is not lithographed maps, but manuscript materials with the necessary mathematical data for [illegible] [illegible] to the work. It appears to the Govt. General in Council, in the present state of the subject, [illegible] that the preparation of such materials [illegible] [illegible] should, as in [illegible], proceed with the survey.

6. To [illegible] of the Government of India before deciding whether an extra establishment is necessary, [illegible] full information in [illegible] and present [illegible] [illegible] of the [illegible] and the work it has [illegible] The [illegible] [illegible] survey and the work [illegible] [illegible] in

scales of topographical survey, by a change in the constitution of parties, by a redistribution of the Revenue and topographical branches, or in any other way it may not be possible without interfering with the main object of the survey to provide the collection of geographical materials at a somewhat more rapid rate than has hitherto been the case. I am therefore to commend the whole subject to the careful consideration of His Excellency the Governor in Council.

I have the honor to be

Sir

Your most obedient servant

[illegible]

Secretary to the Govt. [illegible]

24

Years.	Districts.	Area Sqr. Miles.	Total	Remarks.
1873/74.....	Tinnevelly...	4676		
	Trichinopoly..... ...	3515		
	Chingleput.....	2753		
	Nellore.....	8462		
	Kurnool..... ...	7358	26764	Nallamallai range incomplete.
1874/75.....	Kistnah..... ...	8036		Revenue Survey completed.
	Salem.....	7483		Do.
	Godavery.....	6224	21743	Do.
1875/76.....	Coimbatore....	7432		
	Neilgherries.....	749		
	Wynaad.....	600	8781	
1876/77.....	Cuddapah.....	8367		
	North Arcot..... ...	7139		
	Ganjam.....	4000	19506	
Commenced.....	Madura.....	9502		
	Bellary.....	11007		
	South Arcot.....	4873	25382	
Not Commenced	Vizagapatam.....	5303		
	Malabar.....	5500		
	South Canara.....	3902	14705	
Excluded...	Tanjore.....	3654		

to start Photo-Lithography successfully is in favour of the estimate

ture to avail myself of this opportunity to solicit the Orders of my proposals contained in letters dated respectively 22nd May 1871, d 20th July 1872, No. 1581/45, of which I beg to enclose duplicate

I have &c. &c.

(Signed) F. PRIESTLEY *Colonel*,
Superintendent Revenue Survey.

Revenue Survey Office,
OOTACAMUND
12th *June* 1873.

No. 1333/40

From

The Superintendent Revenue Survey.

To

The Secretary to Government
Revenue Department.

SIR,

I have the honour to acknowledge the receipt of G. O., dated 17th May 1873, No. 495 calling for information regarding Geographical Materials available from the Madras Survey and the progress made in the topographical surveys of this Presidency.

2. In my letter dated 20th July 1872 No. 1531/45 I gave full information on these points and others connected with the Madras Survey and I was in hopes that it would be communicated to the Supreme Government as it was submitted in reply to Resolution of that Government dated 13th May 1872, No. 301 making a somewhat similar, but more comprehensive call. I sincerely trust that the Supreme Government may not in the absence of information deal summarily with the topographical portion of the Madras Establishment as they have already done with the Civil pay of Military Officers in the Department. In this case a general break up may be anticipated and the Department to the construction of which I have devoted the last twenty years, I shall have the mortification of seeing totally overthrown from no shortcomings or misconduct on my part, but simply for want of the support and assistance I think I had every reason to look for at the hands of Government.

G, O. 18th January 1873, No. 68.

From Superintendent Revenue Survey to Secretary to Government 31st January 1873, No. 307/9.

3. I beg to submit a list of Maps other than Village Maps for transmission to the Government of India and also a Memo of the probable dates on which District Maps on the scale of 2 miles=1 inch will be ready. This memo is however merely an estimate. Many unforseen circumstances may occur to render it incorrect. The refusal of the Supreme Government to sanction an additional Topographical Establishment, the estimate for which was submitted pursuant to their own order, and the negative to my application for a manipulator from Southampton are both drawbacks, on the other hand our having been able, in spite of all obstacles, to start Photo-Lithography successfully is in favour of the estimate being correct.

Dated 13th May 1872 No. 301

Pay Rs. 150.

4. I venture to avail myself of this opportunity to solicit the Orders of Government on my proposals contained in letters dated respectively 22nd May 1871, No. 1138/42 and 20th July 1872, No. 1531/45, of which I beg to enclose duplicate copies.

I have &c. &c.

(Signed) F. PRIESTLEY *Colonel*,
Superintendent Revenue Survey.

Revenue Survey Office.

No. 1581/25

Camp Coimbatore
20th July 1872

27

From

The Superintendent Revenue Survey.

To

The Secretary to Government
Revenue Department.

SIR,

I have the honour to acknowledge the receipt of your docket of the 20th May 1872 giving cover to copy of letter from the Government of India No. 1737 of the 13th Idem and directing me to furnish through the Director Revenue Settlement and Board of Revenue a complete account of the Survey Establishments of this Presidency.

2/ No time shall be lost in carrying out these instructions, at the same time I venture respectfully to point out that in his letter dated 22d February 1871 Para 3 the Surveyor General dwelt strongly on the urgent need of the supply of Geographical materials from the Survey Department of this Presidency. In Paras 3 of the same letter & Para 5 of letter dated 7th October 1870 No. 533E he shewed the necessity for strengthening the hands of the Superintendent Revenue Survey and in letter No. 533E recommended his approval of the measure

No. 324

7th October 1870 Para 4

Received 30th Sept
Reg. Dft Para 11/12
Ans 4-10-135

taken in this Presidency for filling up gaps existing in the Revenue Survey Maps and significantly remarks that it is to be regretted steps to this end were not taken years ago. I may also add, that the Secretary of State for India notes in his despatch dated 2nd November /71 Dº 3 that progress has been made in filling up these gaps & is pleased to express his general approval of the topographical Surveys executed for this purpose.

Vide Govt Cº 16th Feb 72 Dº 206

3/ A glance at the accompanying Sketch will I think shew that it will be true economy to have the lands originally excluded, topographically surveyed by the Department & that a grant of money made immediately & whilst the Survey Establishment is on the spot will be of more real value than one of double the amount two or three years hence as may probably be the result of waiting till after the first call for this has been considered.

Sketch Map shewing Zemindaries, in Orange to be excluded from Demarcation

4/ If the suggested severance of the Topographical from the Revenue Survey merely implies, that the subsidiary Survey on a smaller scale for the purpose of taking notice of such tracts as may not be included in the 16 in. Survey, is to be placed under a separate officer of the Madras Survey Department and that he is to work conjointly with & under the general direction of the Madras Superintendent it is a measure that I can heartily advocate, the more so as the Department possesses an Officer qualified for the post.

5/ If on the contrary this measure is to altogether change the Character of the Revenue Survey and deprive it of one of its distinctive advantages viz the delineation on the village maps of topographical detail I beg most respectfully to remonstrate against it. The insertion of detail in the village maps is the point on which all Revenue Officers insist & with reason. Give a District Revenue Officer a mere Collection of fields in outline and he will in all probability spend half his morning in endeavouring to identify the particular field of which he is in search. Add to it the well pagodas, topes, Channels &c &c and with such land marks he can with ease fix his position. I have myself experienced the difficulty when inspecting Demarcations on the ground with nothing to guide me but a Demarcation Sketch & the village map without details will be identical with one of three Sketches. One of the maintainance of this Revenue Survey is to render the European Revenue Officer independent of the village Accountant & this aim will not be attained unless the village map is of itself a sufficient guide. The plan moreover has been tried in one taluk without success. For some irrigation project a topographical survey of a large tract of Country was required and to meet this immediate pressure the topographical details were laid down

taken in this Presidency for filling up gaps existing in the Revenue Survey Maps and significantly remarks that it is to be regretted steps to this end were not taken years ago. I may also add that the Secretary of State for India notes in his despatch dated 2nd November /71 Dº 3 that progress has been made in filling up these gaps & is pleased to express his general approval of the topographical surveys executed for this purpose.

Vide G.O. 1st Dec 1871 Dº 206

3/ A glance at the accompanying sketch will I think shew that it will be true economy to have the lands originally excluded, topographically surveyed by the Department & that a grant of money made immediately & whilst the Survey Establishment is on the spot will be of more real value than one of double the amount two or three years hence as may probably be the result of waiting till after the topo^l called for has been concluded.

Sketch Map shewing Jurisdictions, &c. & lands excluded from Demarcation

4/ If the suggested severance of the Topographical from the Revenue Survey is merely implies, that the subsidiary survey on a smaller scale for the purpose of taking notice of such tracts, as may not be included in the 16 in. survey, is to be placed under a separate officer of the Madras Survey Department and that he is to work conjointly with & under the general direction of the Madras Superintendent it is a measure that I can heartily advocate, the more so, as the Department possesses an Officer qualified for the post.

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scale of 4 inch = 1 mile instead of in the village maps. Specimens for comparison are appended.

6/ But still further if the proposed measure has for its object the providing in the work done of the Bengal Topographical Survey, I am inclined with all deference earnestly to protest against sacrificing the Madras to the Bengal Establishment, the more so as I can show that no necessity exists for introducing a Bengal Topographical survey party into the field work of the Revenue Survey in this Presidency.

7/ To Bombay it has seemed advisable to transfer from Bengal three Sikh Topographical parties on account of the almost total want of Topographical maps in that Presidency. I also learn that the Bombay Revenue Survey Department did not combine a topographical Survey of the Country with their own special operations.

8/ But the Surveyor General has personally brought to notice that there is far from being the case in the Presidency that Topographical maps exist & that the Madras Survey Department is working on a perfect & satisfactory system. It would therefore appear that there is no urgent necessity for the transfer to Madras of Bengal Surveyors.

9/ It is thus abundantly evident that the arrears of topographical work, viz. the unsurveyed tracts in Districts for which the Revenue Survey has been completed are not immediately required, and when I state that in order to render useful the Survey of five of the Districts in which the Revenue Survey has been completed containing in all about 27000 Sq.r miles, the topographical Survey of a little more than 2000 Sq.r miles only is wanting, it will struck the reader that no sweeping measure totally disorganizing the Madras Survey Establishments is needed but simply an increase of Surveyors in the field & draughtsmen & compilers in the Central Office or in other words that funds should be forthcoming which must be granted let the work be performed by whom it may.

7th December/70 No 1966
18th April/71 No 192.

10/ I would further remark that a correspondence referred to in Government orders as per margin lead to the belief that the appointment of the Officer in Charge of the 3 Topographical party to carry out the Madras Topographical Survey would not be conducive to harmonious working of the Revenue & Topographical branches.

letter No 324, 22nd February/71 Para 6.

11/ Although fully convinced that for the Survey of valuable cultivated tracts the 4 inch scale is more suitable than any smaller one more especially when required to blend harmoniously on reduction with the reduced 6 inch of the 16 in. scale survey, yet as the need for utilising the available Geographical material is so pressing I would give the 2 in scale a trial. From Para 3 of letter from the Secretary to G. I. Home Department in G. No 431 dated 1st April/70, I was under the impression that the 4 in. scale had the approval of the Supreme Government.

12/ It is stated that lithographed

maps are not required as causing delay I beg to represent that the delay caused by lithography is inappreciable, in fact it would take very nearly the same time & labour to make a manuscript copy as to lithograph a map. I think it also desirable to observe that in producing these lithographed maps we are supplying a local want. They are greatly valued by & have afforded substantial aid to the Revenue, Police, D. P. W., Irrigation & Railway Companies & other Government Departments. The labours of the Madras Survey are not therefore unfruitful although circumstances have hitherto prevented their results from being incorporated in the Ordnance Atlas.

13/ I consulted the Board of Revenue on the subject of the necessity of surveying village boundaries in Zemindary lands and it was decided with the concurrence of the Board that no such necessity existed.

Pro: Board Revu No. 423 of 17th Feb/69 printed in G.O. 17 March/69 No. 720

14/ The scale of Establishment proposed by me is taken exception to as not being on the Bengal Model. I would however deprecate any arbitrary treatment of Survey Establishments in this Presidency. The disproportion between Europeans & Natives is noticed in the letter under acknowledgment. In the first place I have to explain that the numbers put down in the letter are not correct. I should think there will probably be double

G.O. No. 328 of 2nd February /72

double the number of Europeans namely (6) and of the remainder from one third to one half would perhaps be East Indians. The Superior Officers check the work of the Surveyors and no surveyor is ever more than a week without his work being inspected in the field. The Office Establishment would be composed chiefly of Natives. I have further to observe that the time of the Superior Officers in the Bengal Topographical Surveys is much occupied in performing minor triangulations. The existence of a large number of Trigonometrical points & stations in the localities wherein we are employed & the frequently minute size of the patches to be topographically surveyed renders the necessity for fixing many points by minor triangulations infrequent.

15/ I may perhaps be permitted to point out that the System of Revenue Survey originated by me in 1853 & continued up to the present date, is, unless I am misinformed, either adopted or about to be adopted in future Revenue Surveys under Bengal, that the topographical Surveys as yet executed by us have met with the approval (vide Para 2) of the Surveyor General & of the Secretary of State & that the Madras Government are satisfied with them, with all deference therefore I venture to say that it seems hardly fair to go out of the way to anticipate failure merely because the scale proposed

Letter No. 533 F 7th October /70. Para 4.

Despatch No. 3 of 2 Nov /71 printed G.O. 1st February /72 No. 206

proposed

proposed differs from that established in another Presidency. It is probable susceptible of improvements which could be made as found necessary. The Supreme Government do not object to it as extravagant & to meet the wishes of Government in affording suitable employment to a large proportion of natives.

16/ I endeavoured in my report & letter to explain "the cause of so little geographical material being furnished by a Survey Establishment which had completed 54000 Sq.ms of Country". I can only again repeat that the extinction of hatches of land generally small, in extent from our operations for some years filled up a large aggregate Amount of Arrear although as already stated each extinction was generally small. I would again solicit attention to the Sketch which accompanies the letter and which I trust will prove more intelligible.

17/ In conclusion I would draw attention to the fact that of the 20 Districts of which the Presidency is made up, there are only three in which we have not yet set foot, it would therefore seem very late in the day to make any violent or puzzling change in the Madras Survey Establishment & one which cannot be most distasteful & depressing to the Officers composing it, a change in favour which neither the Madras Government nor the Surveyor General would seem to advocate.

Printed in G.O. No 1791 dated 16th November 1870

Printed in G.O. No 692 dated 18th April 1871.

Printed in G.O. No 1185 dated 8th August 1870.

Surveyor General's letter No 289, 22d August 1870 Paras 2, 15, 19, 20

Ltr No 33 dt 7th October 1870 - Paras 4 & 5.

Ltr No 324, 22nd July 1871 Paras 5 & 6

Ltr No 29/3 of 6th January 72 printed in G.O. No 328 of 22nd February 1872

18/ I have now put matters fairly before you and earnestly request that in the interest of Government, & the Surveyor General & of the Department, Government will be pleased to support the following proposals.

I That the Central Office shall be augmented at any rate as a temporary measure to the extent proposed in my letter.

That one Topographical party of the strength proposed by me shall be employed at any rate till Arrears are brought up.

19/ Should a reduction in our present Establishment be deemed indispensable in order to meet the increased expenditure recommended, I would as a last resource name the 4 Cavalry Survey party as the one to be converted into a Topographical one. It was set on foot in 1866 from the Surveyor & others whose services were available on the completion of the Kennedy Survey. It is only of half the strength of the other parties and on the account neither so efficient nor so economical as they are. The last Government table has been entered on & when the Revenue Survey of it has come to an end, I believe it would be true economy to distribute the men not required amongst the other parties and of the Topographical and other Surveyors to form a small Topographical party, to complete work already commenced.

Chas [illegible]

Signed / F Rustomjee

Supt Revenue Survey

P.S. I venture to hope that the consideration of the question raised in the communication to which this paper will not delay the re-organisation of the Madras Revenue Survey Department submitted in my letter of the 22nd May 1871 No 1138/42 one of the objects of the scheme was to put the Madras officers on a fair footing as regards salary. I think I am justified in saying that though they have hitherto drawn less pay than those in Bengal their duties are certainly not less varied, less fatiguing, that there is no less important & Demarcation being performed by them, than those of Bengal Revenue & Survey officers. I should therefore be glad to see them more equally remunerated. The sanction to the proposed re-organization for it remembered involves no additional expenditure & the consideration of the report now called for would in no way be hindered nor delayed if the allotted funds were in the meantime more economically distributed.

(True Copy)

Revenue Office
Ootacamund
20th August 73.

Printy Col
Superintendent Survey

Proceedings of the Madras Government, Revenue Department,
1st February 1872.

No. 10. Read the following despatch from the Right Honourable the Secretary of State for India, (Geographical,) to His Excellency the Right Honourable the Governor in Council, Fort St. George, dated India Office, London, 2nd November 1871, No. 3:—

I HAVE to acknowledge the receipt of your Excellency's despatches dated November 24th (Revenue No. 38), 1870, January 30th (Revenue No. 3), and March 13th (Revenue No. 12), 1871, advising the despatch of cases of Maps which have been duly received, and of that dated July 8th (No. 19, Public), 1871, forwarding Mr. Pogson's report on the arrangements for the registry and reduction of meteorological observations in your Presidency..

2. The scientific accuracy and precision with which the village Maps have been constructed reflect great credit on Colonel Priestley and his staff, and furnish conclusive evidence of the efficiency of the system adopted for the Madras Revenue Survey. The work is, indeed, quite on a par with anything that has been executed in Europe. I perceive that progress has been made in filling up the gaps which were originally left through the omission of rent-free lands, and that the topographical surveys executed for this purpose contain almost all the detail that can be desired. I observe, however, an absence of figures showing the height above the sea of peaks and high ground—a point to which Colonel Priestley's attention should be called.

3. The series of beautiful Maps on a scale of one inch to the mile, and of Memoirs giving the results of surveys made under the auspices of the Madras Military Institution and of Colonel Colin Mackenzie, and others in the commencement of the present century, is both interesting and valuable. It is desirable that this series, preserved for reference in the Geographical Department of the India Office, should be complete; but I find that this is very far from being the case. There are very few copies of the original Maps here, and several volumes of the Memoirs are also missing. I presume that complete sets both of the Maps and Memoirs are preserved at Madras, either in the Office of the Secretary in the Department of Public Works, or in that of the Superintendent of the Revenue Survey. I enclose a list of such of the Memoirs and M. S. Maps referred to as are now in the India Office, and I request that you will cause a list to be prepared and forwarded to me of such volumes of the Memoirs as are missing from the India Office set, and of the Maps which belong to them, as well of other Maps which are wanting to complete the set here. If duplicates exist in Madras, one copy of each might be transmitted to this Office; if not, I shall be glad to be furnished with an estimate of the cost of making copies of the missing volumes and Maps, which are necessary to complete the India Office set.

4. With reference to the papers forwarded with my despatch in this department, dated May 1st (No. 2), 1871, I request that you will furnish me with the views of your Government on the requirements of the Madras Presidency with regard to the execution and revision of Marine Surveys.

No. 11. ORDER THEREON, 1st February 1872, No. 206.

Miscellaneous.

12th October 1870, No. 1,547.
21st Nov. ,, ,, 1,817.
27th January 1871, ,, 188.
7th March ,, ,, 414.

ORDERED that the foregoing despatch be communicated to the Superintendent of Revenue Survey and to the Board of Revenue, with reference to the Proceedings of Government noted in the margin, and that Colonel Priestley's attention be called to the observation of the Secretary of State at the end of paragraph 2.

2. The subject of paragraph 3 of the despatch will receive attention in the Public Works Department, and that of paragraph 4 in the Marine Department.

(True Extract.)

Secretary to Government.

To the Superintendent of Revenue Survey.
,, the Board of Revenue.
,, the Public Department.
,, the Public Works Department,
with two catalogues (one of Maps and the other of Memoirs) received with the despatch.
,, the Marine Department.

Exd. F. R. Dantleman.

Proceedings of the Madras Government, Revenue Department,
1st February 1872.

No. 11. ORDER THEREON, 1st February 1872, No. 206.

Miscellaneous.

12th October 1870, No. 1,547.
21st Nov. ,, ,, 1,817.
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(True Extract.)

Secretary to Government.

To the Superintendent of Revenue Survey.
,, the Board of Revenue.
,, the Public Department.
,, the Public Works Department,
with two catalogues (one of Maps and the other of Memoirs) received with the despatch.
,, the Marine Department.

Exd. F. R. Dantleman.

Proceedings of the Madras Government, Revenue Department, 7th December 1870.

No. 156. Read the following endorsement of the Secretary to the Government of India, Home Department:—

Read the following letter from the Secretary to the Government of India, Home Department, (Geographical,) to the Surveyor-General of India, dated Simla, 3rd September 1870, No. 328.

I AM directed to acknowledge the receipt of your letter, No. 289-F., dated the 2nd ultimo, on the subject of the representation made by the Government of Madras regarding a supposed revision of the old survey of the Neilgherry Hills.

2. In reply, I am to inform you that the Governor-General in Council concurs in the views, expressed in the 26th paragraph of your letter, as to the action of Colonel Saxton in communicating direct with the Government of Madras. The instructions which you have given for his future guidance, and which may be promulgated throughout your department, are also approved, with the qualification that an Executive Officer may, if he find it necessary, owing to a reference from a Local Government, or to other causes, address the Local Government without previous reference to the Surveyor-General. In this case, he should, however, send a copy of his letter or report to the head of his department without delay for information.

3. A copy of your letter under acknowledgment, and of this reply, will be furnished to the Government of Madras.

No. 329.

COPY of the above correspondence forwarded to the Government of Madras for information, with advertence to communication thence, No. 523, dated 13th April 1870. Attention is, at the same time, drawn to the letter noted on the margin, with reference to the 27th paragraph of Colonel Thuillier's Report.

From Secretary to the Government of India, Home Department, to the Acting Secretary to the Government of Madras, No. 96, dated the 12th March 1870.

(Signed) E. C. BAYLEY,
Secretary to the Government of India.

No. 157. ORDER THEREON, 7th December 1870, No. 1,965.

Land Revenue.

COMMUNICATED to the Superintendent of Revenue Survey for any observations which he may desire to offer.

2. With advertence to the concluding sentence of their docket, No. 329, the Government of India will be referred to this Government letters, under date 8th August and 12th October 1870, Nos. 1,186 and 1,551.

(True Extract.)

(Signed) W. HUDLESTON,
Secretary to Government.

To the Superintendent of Revenue Survey.

Exd. F. R. Bantleman.

Govt. of India
REVENUE.
To
THE SUPERINTENDENT OF REVENUE SURVEY.
Land Revenue.
G. O., 7th February 1872, No. 2
Read
No. 1011
REGISTERED.

Old Survey of the Neilgherries—Correspondence from the Surveyor-General of India regarding its revision, communicated to Superintendent of Revenue Survey for observations.

Proceedings, Revenue Department, 18th April 1871, No. 182-187.

Read.

G. O., 11th December 1871, No. 1,965.

REVENUE.

To

THE GOVERNMENT, &c.

MADRAS SAMACHAR PRESS.

GOVT. OF MADRAS GENERAL DEPT. 1871

Proceedings of the Madras Government, Revenue Department, 18th April 1871.

No. 182. Read the following letter from the Superintendent of Revenue Survey, to the Secretary to Government, Revenue Department, Fort Saint George, dated Bangalore, 25th February 1871, No. 509-20:—

I HAVE the honour to acknowledge the receipt of the Order of Government, dated 7th December 1870, No. 1,965, communicating to me, for observations, correspondence from the Surveyor-General of India on the old survey of the Neilgherries.

2. In paragraphs 3, 4, 15, and 16, the Surveyor-General points out that the cause of the misconception with regard to the nature of the work to be performed by Colonel Saxton arose from the mistaken and unauthorized version of it by Colonel Saxton in his memorandum of the 15th October, submitted, without sanction, direct to the Madras Government; that the term "revise" made use of by him was quite inapplicable, and that the memorandum itself altogether conveyed an erroneous and unfortunate impression; that it was drawn up in excess of his instructions; and that, had the Surveyor-General ever seen it, he would have prevented the submission to the Madras Government of a document so likely to cause complications. These statements will, I trust, be considered to excuse my having misapprehended the nature of Colonel Saxton's proposed operations, and absolve me from the charge of over sensitiveness made by Colonel Thuillier in a subsequent paragraph.

3. Had I understood what the contemplated work really was, I should not have presumed to offer any remarks on its necessity or the reverse, it being of a description altogether foreign to, and beyond that of, a Revenue Survey. In the remarks I did make, I endeavoured, as far as possible, to confine myself to facts.

4. I have on more than one occasion gratefully acknowledged the valuable advice and assistance at all times afforded by the Surveyor-General of India, and have every desire to reciprocate his good offices as far as lies in my power. With reference to the remarks he makes in paragraphs 7, 17, 18, and 27, on the non-submission of the results of the labours of the Madras Revenue Survey in a complete and systematic form, I have already explained to Government that the narrow view at first taken of its sphere of action by confining its operations exclusively to land paying tax to Government prevented the preparation of district or even taluq maps in a complete and systematic manner.

Colonel Thuillier's letter, paragraphs 19 and 20.

Paragraph 3 of report printed in G. O., dated 14th November 1870, No. 1,791.

5. It cannot be imagined that I am indifferent to, or that I cannot appreciate the credit that would be gained by this department in contributing to the revision of the Atlas of India; but hitherto, as already explained, it was out of my power to do so. I am happy, however, now to be in a position to say that I have under preparation a complete map of one district, and that I trust for the future to be able to publish with little interruption similar maps of other districts as the portions formerly excluded are surveyed.

6. I do not think I can be charged in any way whatever with an unwillingness to afford the Surveyor-General either information regarding the mode of conducting the Madras Surveys, or

21st February 1867.
29th November 1867, No. 2,212-340.

the limited fruits of its labours. The accompanying letter from him and my reply I trust proves this.

7. There is nothing in Colonel Saxton's letter which calls for notice, unless the commencement of the 7th paragraph is meant to imply that I have shown myself neither ready nor willing to assist him. He never on any occasion deemed it necessary to address me, but I may mention that, according to departmental rules, his applications to Major Hessey were referred to me for approval.

8. In paragraph 9 of his letter, Colonel Saxton expresses an opinion that, if Government had sent him my letter, he could have easily removed my unfortunate misapprehensions of improper interference with the department. I cannot, on the other hand, help thinking that if Colonel Saxton could have brought himself to address me in the first instance, and explaining his object to have applied to me for such aid as I could afford, it would have been on the whole better. Neither the Supreme Government, that of Madras, nor the Surveyor-General, would have then been troubled with what is now explained to be a matter of very small importance, but which at the time certainly appeared hostile to this department, the more so from the studious avoidance on Colonel Saxton's part of any recognition of the head of it.

9. Colonel Saxton puts on record that I omitted to notice some defects in the Table of Altitudes. I submit that it would have been an impertinence on my part to do so, when the only question at issue was the existence of the Survey Registers, in discovering which, I performed a duty that had been neglected by those whom it specially concerned.

No. 183. ORDER THEREON, 18th April 1871, No. 692.

Land Revenue.

ORDERED to be recorded.

(True Extract.)
(Signed) F. BRANDT,
Under-Secretary to Government.

To the Superintendent of Revenue Survey.

Exd. F. R. Bantleman.

No. 423. Read the following Proceedings of the Board of Revenue, dated 17th February 1869:—

Read the following letter from the Superintendent of Revenue Survey, to the Secretary to the Board of Revenue, dated Chepauk, 21st January 1869, No. 113-4.

1. In their Order, dated 3rd September 1868, No. 2,318, Government concur with the Board of Revenue in considering it desirable that the Survey Department should prepare complete maps of the several districts, and desire to be informed of the arrangements proposed for carrying this design into effect, and to be furnished with an estimate of the probable cost.

2. I would propose to make use of the Demarcation Department for the purpose of defining boundaries in all districts where its services are available. The small detachment thus required would, I think, be easily spared for the short time it would be wanted to mark out the necessary boundaries.

3. In the districts where the aid of the Demarcation Department cannot be obtained, I would propose to ask for the assistance of the Local Officers, and from the reception similar proposals have met with in the few instances they have been made, I have no doubt of its being willingly given. Among the many advantages of entrusting the definition of these boundaries to the District Officers, I may mention that their superior local knowledge and the greater confidence the inhabitants have in their decision enable them to bring disputes to a close after a much shorter enquiry than when conducted by the Officers of the regular Demarcation Establishment. It is possible, indeed, that, in some cases, their own duties may be so onerous as to prevent their undertaking immediately the definition of boundaries within their limits, or perhaps of completing the work without interruption. If, however, this operation be commenced before long in the districts to be first taken in hand, I feel certain that but little delay to the survey is likely to result. The line of boundary having been determined and temporarily marked by the District Officers, the Surveyors could themselves have the necessary permanent demarcation performed during survey.

4. With regard to Zemindaries, I concur with the Board in opinion that it is not advisable to mark and survey village boundaries. I would not, moreover, advocate the same minute demarcation as in Government territory.

5. With a view to obtain the information called for, I have had several tracts of Zemindary land in the Nellore District surveyed as an experiment, and beg to submit the map of one of them containing 58½ square miles as a specimen of the proposed survey. This survey has been performed at the very moderate cost of about Rupees 10 per square mile.

	Rs.	A.	P.
Godavery	11	1	11
Kistna	11	2	5
Salem	9	10	1
Nellore	14	15	5
Coimbatore	10	13	2
Tinnevelly	8	7	6
Kurnool	13	1	11
Madras	31	7	2
	8)111	7	3
	13	14	11

6. Taking into account all the topographical work hitherto completed by this Department, we arrive at an average cost per mile of Rupees 13-14-11, ranging from Rupees 8½ to Rupees 31½. In the experimental one, however, but little has been expended on demarcation, for which some allowance must be made. I would, therefore, set down the probable cost of survey and demarcation in the plains as Rupees 20 per square mile at the outside.

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Proceedings of the Madras Government, Revenue Department,
1st *April* 1870.

No. 12. Read the following letter from the Secretary to the Government of India, Home Department Revenue—Geographical, to the Acting Secretary to the Government of Fort Saint George, dated Fort William, 12th March 1870, No. 96 :—

I AM directed to acknowledge the receipt of your letter, No. 215, dated 15th ultimo, furnishing information on certain points connected with the organization of the Madras Revenue Survey.

2. In reply I am to say that the Governor-General in Council would wish for further information regarding the nature of the intermediate Topographical Survey of tracts not surveyed on the sixteen-inch scale. It is assumed that, in the accuracy of its geodetic basis, it does not fall short of the Revenue Survey ; but the scale is not stated, nor the amount of detail given. It is also not shown, with sufficient clearness, what has been done towards compiling and reducing the village Maps. I am therefore to request that a fuller report on these points may be submitted.

3. I am to add that the Governor-General in Council is of opinion that if good Maps, on the scale of four inches to the mile, can be produced by any moderate expenditure, it will be economical to prepare them even for the use of the Government, and that such Maps will probably be to some degree re-productive.

4. A specimen of the Maps on the scale, 4 inches=1 mile, prepared under the superintendence of the Surveyor-General in the Bengal Presidency will be sent for the inspection of the Governor in Council.

No. 13. ORDER THEREON, 1st April 1870, No. 431.

Land Revenue.

FORWARDED to the Superintendent of Revenue Survey who will be good enough to submit, with as little delay as possible, the further report called for in paragraph 2, and will state his opinion regarding the probable expense of preparing the Maps referred to in paragraph 3.

2. The Map mentioned in paragraph 4 will be forwarded for his inspection when received.

(True Extract.)

(Signed) R. A. DALYELL,
Acting Secretary to Government.

To the Superintendent of Revenue Survey.

Exd. F. R. Bantleman.

Govt. of India, 1871 Extracts.

REVENUE.

To

THE SUPERINTENDENT OF REVENUE SURVEY.

Dated April 1871.

Read

G. O., 19th April 1871, No. 682

APRIL.
Nos. 182-183.

Old Survey of the Nizam's Dominions—Observations of the Superintendent of Revenue Survey on the letter from the Surveyor-General on this subject, received.

7. In hilly and wild jungly tracts, the expense would be less, as the scale of the survey need not be so large as elsewhere and the plane table with points trigonometrically fixed would be substituted for the more expensive and accurate processes elsewhere required. From Rupees 12 to Rupees 15 per square mile would, therefore, I think, meet the expense of survey operations in such localities.

SUBMITTED for the orders of Government.

2. The Board consider Colonel Priestley's proposals judicious, and anticipate no difficulty in having the demarcation carried out in communication with the local authorities when the special Department is not available.

3. Any exceptional necessity for the appointment of an extra officer will be brought to the notice of Government in cases where the boundary with a Native State or Zemindary is in dispute.

4. The Board are of opinion that the objects sought, warrant the expenditure of the sums named by Colonel Priestley *i. e.* 20 Rupees per square mile for settled parts, and 12—15 in hilly or jungly places.

No. 424. ORDER THEREON, 17th March 1869, No. 720.

Miscellaneous.

1. The arrangements proposed by the Superintendent of Revenue Survey, and concurred in by the Board of Revenue, for the preparation of complete maps of the several districts, are approved.

2. The Government observe that the probable expen[illegible]ure will be 20 Rupees per square mile, for settled parts, and from Rupees 12 to Rupees 15 in hilly and jungly quarters. An estimate of the total cost of the measure is desirable, and the Board will be requested to submit one, in communication with Colonel Priestley.

(True Extract,)

(Signed) R. A. DALYELL,

Acting Secretary to Government.

To the Board of Revenue.
,, the Superintendent of Revenue Survey.
,, the Director of Revenue Settlement.

Exd. G. A. Turton.

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(True Extract,)

(Signed) R. A. DALYELL,

Acting Secretary to Government.

To the Board of Revenue.
,, the Superintendent of Revenue Survey.
,, the Director of Revenue Settlement.

Exd. G. A. Turton.

Govt. of 1869 & Miscellaneous.

REVENUE.

To

THE BOARD OF REVENUE,

&c., &c., &c.

Dated March, 17th.

Recd.

Read.

G. O., 17th March 1869, *No.* 720.

MARCH.

Nos. 423-424.

Survey Maps of the Madras Presidency.—Arrangements proposed by the Superintendent of Revenue Survey for their preparation, approved.

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Proceedings of the Madras Government, Revenue Department, 22nd February 1872.

No. 257. Read the following letter from the Superintendent of Revenue Survey, to the Secretary to Government, Revenue Department, Fort St. George, dated Chepauk, 6th January 1872, No. 20-3:—

REFERRING to G. O., dated 3rd October 1871, No. 1,727, I have the honour to submit a scale of additional establishment for the purpose of accelerating the completion of the four-inch topographical survey of Zemindaries and tracts originally excluded from the operations of the Madras Revenue Survey, and for working up the materials thus obtained into a form useful for geographical purposes, in accordance with the desire of the Surveyor-General of India, a desire which has also the approval of the Supreme and Home Governments.

2. It is to me a source of great gratification to find that the Surveyor-General expresses himself satisfied with the manner in which the surveys of this Presidency, under my superintendence, are and have been carried out. I believe that to his advocacy at the commencement is, in a great measure, due the more accurate nature of our operations than was by some considered necessary for a Revenue Survey; but I trust I may be permitted to state that I was myself fully impressed with the necessity of accuracy, if any thing was contemplated of a general or extended nature.

To Secretary to Government of India, No. 533, 7th October 1870, paragraph 4.
To Secretary to Government of India, No. 324, dated 22nd February 1871, paragraphs 2 and 6.

3. In submitting the estimates of establishment required, I beg to observe that, as no exception is taken to the mode of conducting our surveys, and as I have at no time declined to undertake any duty that Government might consider fit to entrust to me, it appears to me that all requirements will be met if I can undertake to supply taluq and district maps on the one-inch and half-inch scale within a reasonable period.

4. I beg to append a list of taluq maps, etc., comprising an area of square miles 11,705, of which three lithographed copies each have been furnished to the Surveyor-General of India.

LIST of Taluq Maps, etc., of which three lithographed copies each have been supplied to the Surveyor-General of India.

District.	Taluq.	Area in square miles.
Godavery ...	Narsapur	432
	Tanuku	365
	Bhimavaram	321
	Ramachendrapuram	333
	Amalapur	468
	Rajahmundry	329
	Yernagudam	342

List of Taluq Maps, etc.—(*Concluded.*)

District.	Taluq.	Area in square miles.
Kistna ...	Gudivada	595
	Bander	546
	Bezwada	182
	Nandigama	520
	Narsaraopet	685
	Sattanapalli	671
	Repalli	628
	Bapatla	679
	Guntur	481
Nellore ...	Kavalli	548
Chingleput ...	Sydapet	342
Trichinopoly ...	Udiarpoliam	743
	Perambalore	686
	Musari	758
	Trichinopoly	557
South Arcot ...	Chidambaram	373
Nilgiris ...	Coonoor Settlement, including Wellington	10
	Total...	11,644
	Miscellaneous Map.	
Madras ...	8 Municipal Divisions...	27
Coorg ...	Horcornocrakul Nad	33
	Haleri Palace lands	1
	Grand Total...	11,705

Chepauk,
6th January 1872.

(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

Enclosure No. 1.

Scale of proposed Establishment for the Topographical Survey of Zemindaries, and excluded Hills and Jungle.

Rank.	Number.	Rate of pay. Rs.	A.	P.	Total. Rs.	A.	P.	Total pay of each rank. Rs.	A.	P.
1st Assistant Superintendent, Revenue Survey	2	*600	0	0	1,200	0	0	...	...	...
2nd Assistant or Civil Assistant	1	*300	0	0	300	0	0	1,500	0	0
Sub-Assistant	1	250	0	0	250	0	0	...	...	...
Do.	1	200	0	0	200	0	0	...	...	...
Do.	1	150	0	0	150	0	0	600	0	0
Head Surveyor	2	100	0	0	200	0	0	...	...	...
Do.	2	80	0	0	160	0	0	360	0	0
Topographical Surveyors	12	50	0	0	600	0	0	...	...	...
Do.	24	40	0	0	960	0	0	1,560	0	0
Duffadar	2	10	8	0	21	0	0	...	...	...
Head Peons	12	8	0	0	96	0	0	...	...	...
Do.	40	7	8	0	300	0	0	...	...	...
Peons and Measurers	60	7	0	0	420	0	0	...	...	...
Do.	80	6	8	0	520	0	0	1,357	0	0
Head Clerk	2	60	0	0	120	0	0	...	...	...
Clerk	2	25	0	0	50	0	0	...	...	...
Do.	2	15	0	0	30	0	0	...	...	...
Vernacular Clerks	2	15	0	0	30	0	0	230	0	0
Head Computer	2	40	0	0	80	0	0	...	...	...
Computers	4	20	0	0	80	0	0	...	...	...
Cash-keeper and Accountant	2	25	0	0	50	0	0	210	0	0
Record and Store-keeper	2	30	0	0	60	0	0	...	...	...

* Average exclusive of Military pay.

Scale of proposed Establishment, etc.—(*Concluded.*)

Rank.	Number.	Rate of pay. Rs.	A.	P.	Total. Rs.	A.	P.	Total pay of each rank. Rs.	A.	P.
Record Goomastahs	4	15	0	0	60	0	0	...	...	...
Do.	2	10	0	0	20	0	0	140	0	0
Head Draughtsman	2	50	0	0	100	0	0	...	...	...
Draughtsman	6	30	0	0	180	0	0	...	...	...
Do.	6	20	0	0	120	0	0	...	...	...
Do.	8	15	0	0	120	0	0	520	0	0
Head Moochy...	2	10	0	0	20	0	0	...	...	...
Moochy	2	8	0	0	16	0	0	...	...	...
Do.	6	7	0	0	42	0	0	78	0	0
Office allowance	...	...	...	...	...	...	...	120	0	0
Batta and travelling allowance	...	...	...	...	...	...	...	1,000	0	0
Contingencies	...	...	...	...	...	...	...	200	0	0
Total for two Parties.	296	...	...	...	6,555	0	0	7,875	0	0
Do. for one year.	...	...	...	...	...	...	...	94,500	0	0

Chepauk,
6th January 1872.

(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

Establishment for compiling and lithographing Maps in the Central Office.

Rank.	Number.	Rate of pay. Rs.	A.	P.	Total. Rs.	A.	P.	Total pay of each rank. Rs.	A.	P.
Civil Assistant	1	350	0	0	350	0	0	350	0	0
Draughtsman	1	120	0	0	120	0	0	...	...	...
Do.	1	100	0	0	100	0	0	...	...	...
Do.	1	50	0	0	50	0	0	...	...	...
Do.	2	30	0	0	60	0	0	...	...	...
Do.	2	20	0	0	40	0	0	370	0	0
Draughtsman Examiner	1	70	0	0	70	0	0	...	...	...
Do.	1	60	0	0	60	0	0	130	0	0
Tracer...	1	20	0	0	20	0	0	...	...	...
Do.	1	15	0	0	15	0	0	...	...	...
Do	1	10	0	0	10	0	0	45	0	0
Typers...	2	10	0	0	20	0	0	20	0	0
Record-keeper...	1	15	0	0	15	0	0	...	...	...
Assistant Record-keeper	2	10	0	0	20	0	0	35	0	0
Moochies	2	7	0	0	14	0	0	...	...	...
Do.	4	6	0	0	24	0	0	38	0	0
Lithographic Establishment.										
Printers	2	15	0	0	30	0	0	...	...	...
Pressmen	4	8	0	0	32	0	0	...	...	...
Inkmen	2	7	0	0	14	0	0	...	...	...
Stone-cleaners...	4	6	0	0	24	0	0	100	0	0
Total for one month...	36	...	...	...	1,088	0	0	1,088	0	0
Do. for one year ...	...	...	...	...	...	...	...	13,056	0	0

Chepauk,
6th January 1872.

(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

LIST of Taluq Maps etc.—(*Concluded.*)

District.	Taluq.	Area in square miles.
Kistna ...	Gudivada	595
	Bander	546
	Bezwada	182
	Nandigama	520
	Narsaraopet	685
	Sattanapalli	671
	Repalli	628
	Bapatla	679
	Guntur	481
Nellore ...	Kavalli	548
Chingleput ...	Sydapet	342
Trichinopoly ...	Udiarpoliam	743
	Perambalore	686
	Musari	758
	Trichinopoly	557
South Arcot ...	Chidambaram	373
Nilgiris ...	Coonoor Settlement, including Wellington ...	10
	Total...	11,644
	Miscellaneous Map.	
Madras ...	8 Municipal Divisions...	27
Coorg ...	Horcormacrakul Nad	33
	Haleri Palace lands	1
	Grand Total...	11,705

CHEPAUK,
6th January 1872.

(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

ENCLOSURE No. 1.

SCALE of proposed Establishment for the Topographical Survey of Zemindaries, and excluded Hills and Jungle.

Rank.	Number.	Rate of pay.	Total.	Total pay of each rank.
		RS. A. P.	RS. A. P.	RS. A. P.
1st Assistant Superintendent, Revenue Survey	2	*600 0 0	1,200 0 0	... ...
2nd Assistant or Civil Assistant	1	*300 0 0	300 0 0	1,500 0 0
Sub-Assistant	1	250 0 0	250 0 0	... ...
Do.	1	200 0 0	200 0 0	... ...
Do.	1	150 0 0	150 0 0	600 0 0
Head Surveyor	2	100 0 0	200 0 0	... ...
Do.	2	80 0 0	160 0 0	360 0 0
Topographical Surveyors	12	50 0 0	600 0 0	... ...
Do.	21	40 0 0	960 0 0	1,560 0 0
Duffadar	2	10 8 0	21 0 0	... ...
Head Peons	12	8 0 0	96 0 0	... ...
Do.	40	7 8 0	300 0 0	... ...
Peons and Measurers	60	7 0 0	420 0 0	... ...
Do.	80	6 8 0	520 0 0	1,357 0 0
Head Clerk	2	60 0 0	120 0 0	... ...
Clerk	2	25 0 0	50 0 0	... ...
Do.	2	15 0 0	30 0 0	... ...
Vernacular Clerks	2	15 0 0	30 0 0	230 0 0
Head Computer	2	40 0 0	80 0 0	... ...
Computers	4	20 0 0	80 0 0	... ...
Cash-keeper and Accountant	2	25 0 0	50 0 0	210 0 0
Record and Store-keeper	2	30 0 0	60 0 0	... ...

* Average exclusive of Military pay.

SCALE of proposed Establishment, etc.—(*Concluded.*)

Rank.	Number.	Rate of pay.	Total.	Total pay of each rank.
		RS. A. P.	RS. A. P.	RS. A. P.
Record Goomastahs	4	15 0 0	60 0 0	... ...
Do.	2	10 0 0	20 0 0	140 0 0
Head Draughtsman	2	50 0 0	100 0 0	... ...
Draughtsman	6	30 0 0	180 0 0	... ...
Do.	6	20 0 0	120 0 0	... ...
Do.	8	15 0 0	120 0 0	520 0 0
Do.	2	10 0 0	20 0 0	... ...
Head Moochy...	2	8 0 0	16 0 0	... ...
Moochy	6	7 0 0	42 0 0	78 0 0
Do.		... ...	... ...	120 0 0
Office allowance	...	... ...	... ...	1,000 0 0
Batta and travelling allowance	...	... ...	... ...	200 0 0
Contingencies	...	... ...	... ...	
Total for two Parties.	296	... ...	6,555 0 0	7,875 0 0
Do. for one year.	...	... ...	... ...	94,500 0 0

CHEPAUK,
6th January 1872.

(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

ESTABLISHMENT for compiling and lithographing Maps in the Central Office.

Rank.	Number.	Rate of pay.	Total.	Total pay of each rank.
		RS. A. P.	RS. A. P.	RS. A. P.
Civil Assistant	1	350 0 0	350 0 0	350 0 0
Draughtsman	1	120 0 0	120 0 0	... ...
Do.	1	100 0 0	100 0 0	... ...
Do.	1	50 0 0	50 0 0	... ...
Do.	2	30 0 0	60 0 0	... ...
Do.	2	20 0 0	40 0 0	370 0 0
Do.	1	70 0 0	70 0 0	... ...
Draughtsman Examiner	1	60 0 0	60 0 0	130 0 0
Do.	1	20 0 0	20 0 0	... ...
Tracer...	1	15 0 0	15 0 0	... ...
Do.	1	10 0 0	10 0 0	45 0 0
Do	2	10 0 0	20 0 0	20 0 0
Typers...	1	15 0 0	15 0 0	... ...
Record-keeper...	2	10 0 0	20 0 0	35 0 0
Assistant Record-keeper	2	7 0 0	14 0 0	... ...
Moochies	4	6 0 0	24 0 0	38 0 0
Do.				
Lithographic Establishment.				
Printers	2	15 0 0	30 0 0	... ...
Pressmen	4	8 0 0	32 0 0	... .
Inkmen	2	7 0 0	14 0 0	... ...
Stone-cleaners...	4	6 0 0	24 0 0	100 0 0
Total for one month...	36	... ...	1,088 0 0	1,088 0 0
Do. for one year ...	...	... ...	... ...	13,056 0 0

CHEPAUK,
6th January 1872.

(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

Proceedings of the Madras Government, Revenue Department, 22nd February 1872.

No. 258. ORDER THEREON, 22nd February 1872, No. 328.

Miscellaneous.

ORDERED to be forwarded to the Government of India in the Agriculture, etc., Department, with reference to paragraph 4 of Colonel Thuillier's letter, dated 22nd February 1871, communicated with Mr. Secretary Hume's letter, No. 69 (Surveys), dated 24th July 1871.

(True Extract.)

(Signed) W. HUDLESTON,

Officiating Chief Secretary.

No. 230. Read the following letter from the Superintendent of Revenue Survey, to the Acting Secretary to Government, Revenue Department, Fort Saint George, dated Chepauk, 26th August 1870, No. 2,199-57 :—

In their Order marginally noted, Government call on me for information on certain subjects connected with the Survey, I now do myself the honour to submit a report on the points referred to.

30th June 1870, No. 1,002.

2. I beg to attach copy of two letters, addressed me by the Acting Deputy-Superintendent and by the 1st Assistant Superintendent in charge of the Cuddapah Survey, reporting the causes that have delayed the preparation of survey records, etc., in the district.

—

Enclosure No. 1.

15. The cost of sub-dividing fields in the four taluqs of the Kurnool District, referred to in paragraph 15 of the report, appears heavy, and the Government desire to be informed as to the period at which these operations will be concluded.

I. Sub-division of fields, Kurnool.—Only sixteen villages are incomplete. All, except one, will be finished by the end of the month. The remaining one will be ready when the alterations in the demarcation sketches have been completed, which are at present being made in the Settlement Office.

16. Classification by the Settlement Department in the district of Cuddapah must now be approaching completion, and the correct survey areas will, therefore, be required at no distant period. Colonel Priestley is requested to report how soon the whole district will be ready for settlement.

II. Cuddapah areas.—Some have been already furnished ; but changes in the demarcation have rendered alteration in the Survey Accounts necessary.

Vide letters from the Acting Deputy-Superintendent and Assistant Superintendent in charge of Cuddapah, Nos 618-240 and 615-253, of 1st and 12th August 1870.

Jammalmadoogoo and Prodatoor Taluq areas will be ready in a month.

Cuddapah Taluq areas by the end of the year.
Budwail and Sidhout Taluqs during 1871.

It is impossible to estimate the time survey areas will be ready of taluqs in some of which even demarcation has hardly been commenced.

18. It does not appear from the report that lithographed maps have, in all cases, been prepared for those taluqs which have been surveyed. As a general principle, mapping should keep pace with the progress of the Survey.

III. Non-preparation of maps for surveyed taluqs.—As ~~claimed~~ in my letter to Government, dated 29th June 1870, No. 1,674-42, the tracts of unsurveyed land in most taluqs, consequent on the exclusion, by the Demarcation Department, of Zemindari and land unprofitable to Government, caused such unsightly gaps that I delayed printing these taluq maps, until I could complete the survey under the Order of Government, dated 11th March 1869, No. 720. A sketch to illustrate the detached nature of the demarcation in four northern districts is appended. A map of Salem was submitted with their Proceedings, dated 19th August 1863, by the Board of Revenue, No. 5,905.

19. In concluding his report, Colonel Priestley remarks that about 4,000 square-miles have been completed, and are "ready for settlement." The Government, however, observe that this aggregate is not compact, but includes isolated areas on which the Settlement Department cannot as yet commence operations. The Government suggest to the Superintendent whether it would not be advisable to concentrate work more than is at present done, so that tracts of country, sufficiently large and compact to admit of immediate settlement, should be ready for the Settlement Department.

IV. Concentration.—I beg to refer to Proceedings Board of Revenue, 9th June 1862, No. 3,600, containing a letter from Mr. Master.* A perusal of the latter part of paragraph 5* will show that the proposal to employ two survey parties in one district has been discussed and decided in the negative, I have seen no reason to change the opinion I gave at the time.

*Vide Extract appended.

With special reference to the employment of two parties in Cuddapah, in addition to the serious delays and impediments referred to by Mr. Master in his letter just quoted, the following objections to the arrangement strike me :—

I.—The move itself of 200 miles would be expensive both to Government and to individuals.

II.—The division of the party by such a distance would cause confusion in returns and accounts.

III.—There would certainly be a difficulty with regard to accommodation.

IV.—That this separation will form the limited extent of country remaining to be surveyed in the Cuddapah District, probably be continued for some years. The Ameens will complete their work, and leave the district as the detail Surveyors enter it.

V.—That a sufficient area is not ready demarcated to keep the two parties at work.

Extract from paragraph 5 of letter from the Director of Revenue Settlement, dated 7th June 1862, No. 769-51, printed in Proceedings Board of Revenue, No. 3,600, of 9th June 1862.

Major Priestley is, however, of opinion that two full survey parties cannot be efficiently worked in the same district, and I am inclined, from my experience, to agree with him. The operations would be carried on simultaneously in so many villages that the arrangements, which are now made to prevent, as far as possible, obstruction to the work during the Jamabundy and at other seasons when the village officers are called away by the Revenue authorities, would be impossible, and serious delays and impediments, which greatly increase the cost of the work, would be unavoidable.

(A true Extract.)

Chepauk,
26th August 1870.

(Signed) F. J. E. PRIESTLEY, Colonel,
Superintendent of Revenue Survey.

Enclosure No. 2.

From the Acting First Assistant Superintendent of Revenue Survey, in charge of No. 3 Party, to the Superintendent of Revenue Survey, Chepauk, dated Cuddapah, 12th August 1870, No. 645-258.

In reply to your letter, No. 1,998-149, dated 5th August 1870, calling for information regarding the circumstances which retarded the completion of the computation of areas and mapping in this district, I have the honour to inform you that one of the chief causes is the large proportion of corrections found to be necessary in the records received from the Settlement Department. I beg to enclose a list of these for your information ; even on this date there are a few of the sketches in the Settlement Office awaiting amendment.

2. I further beg to inform you that, since the receipt of your letter, No. 1,048-80, of 20th May 1869, every exertion has been, and is being made, to reduce the ratio in advance by the field over the office-work, with some measure of success. This station, through reason of its being unhealthy, is not popular, and much difficulty is experienced in *keeping* men of even ordinary intelligence when they are obtained, thus involving frequent changes; this necessarily tells on the work to some extent.

Statement showing the number of villages returned from time to time to Settlement Department for corrections.

No.	Taluq.	Total No. of villages.	Number of villages returned for correction.	Date on which Demarcation records were originally received from Settlement Department.	Date of last correction received from Settlement Department.
1	Prodatoor	63	35	5th January 1866...	14th June 1870.
2	Cuddapah	124	59	21st August ,, ...	25th July ,,
3	Sidhout	75	47	2nd Nov. 1867...	20th May ,,
4	Budvail	98	83	17th Sep. 1868...	23rd July ,,
5	Pullemput up to 30th June 1870	69	53	8th Feb. 1869...	27th July ,,
		429	277		

(Signed) T. A. TOMLINSON,
Ag. 1st Asst. Supt. of Revenue Survey in charge.

Cuddapah,
12th August 1870.

Enclosure No. 3.

From the Acting Deputy-Superintendent of Revenue Survey, No. 3 Party, Cuddapah, to the Superintendent of Revenue Survey, Chepauk, dated 1st August 1870, No. 618-240.

I have the honour to acknowledge the receipt of Proceedings of Government, No. 1,002, of the 30th June 1870, and to furnish you with the information called for regarding the completion

Circular, No. 1,765-109, of 12th July 1870.

of areas of surveyed taluqs, and my views on the suggestion of Government that the work of the Survey should be more concentrated.

2. The areas of the villages in the Jammalmadoogoo Taluq have been furnished to the Settlement Department, but in consequence of the vexatious changes made by the Demarcation Department in the Sub-division, and re-amalgamation of villages they were recalled for revision. This work will be completed by the close of the ensuing month.

3. The areas of the Prodatoor Taluq villages will be completed about the same time.

4. Those for Cuddapah Taluq will be ready for Settlement purposes by the close of the present year, and for Budvail and Sidhout before the end of 1871.

5. It would be doubtless, to the advantage of the Settlement Department, to have large compact tracts of country ready to operate upon, but unless the demarcation is far enough advanced to supply work for an additional or an enlarged Survey party in each district, concentration of Survey work is out of the question.

6. In the Proceedings of the Board of Revenue, No. 4,855, of 13th July 1870, it is proposed that the Kurnool Survey Party should be moved into Cuddapah on the completion of their present work.

7. I respectfully beg to submit that there is not work enough ready to last it six months.

8. It is stated in the Proceedings above alluded to that two taluqs in the south are already demarcated; I presume Royachoty and Vollpad are the taluqs alluded to.

9. All the records of the former have not yet been handed over to this department, and none of the latter. Had this party been working full strength for the last year, I should now be making application for fresh work.

10. I could now, if advisable, commence work in Royachoty; as only the taluq of Vellaud would be available for the Kurnool Party. The demarcation of Madanapilli, Kalur, and Pulivendla, has, I believe, hardly been commenced, and, judging from the past rate of progress, the Demarcation of the Cuddapah District, and the handing over of the records to the Survey, will not be accomplished under two years and-a-half.

No. 231. ORDER THEREON, 14th November 1870, No. 1,791.

Land Revenue.

ORDERED to be recorded.

(True Extract.)

(Signed) R. A. DALYELL,

Acting Secretary to Government.

To the Superintendent of Revenue Survey.

Ed. F. R. Bantleman.

9. All the records of the former have not yet been handed over to this department, and none of the latter. Had this party been working full strength for the last year, I should now be making application for fresh work.

10. I could now, if advisable, commence work in Royachoty; as only the taluq of Vedigal would be available for the Kurnool Party. The demarcation of Madanapalli, Kalar, and Pulivendla, has, I believe, hardly been commenced, and, judging from the past rate of progress, the Demarcation of the Cuddapah District, and the handing over of the records to the Survey, will not be accomplished under two years and-a-half.

No. 231. ORDER THEREON, 14th November 1870, No. 1,791.

Land Revenue.

ORDERED to be recorded.

(True Extract.)

(Signed) R. A. DALYELL,

Acting Secretary to Government.

To the Superintendent of Revenue Survey.

Ed. F. R. Bantleman.

Proceedings of the Madras Government, Revenue Department,
8th August 1870.

No. 102. Read the following letter from the Superintendent of Revenue Survey, Madras, to the Secretary to Government, Revenue Department, dated Chepauk, 20th June 1870, No. 1,674-42:—

In obedience to the Order of Government, dated 1st April 1870, No. 431, I have the honour to state that the scale of the intermediate Topographical Survey is 4 inches to the mile. It is equally, with the 16-inches detailed survey, connected with the stations of the Great Trigonometrical Survey. It takes note of roads, rivers, canals, telegraph lines, tanks, channels, smaller streams and nullahs, swamps, village-sites, hills and any other remarkable topographical details. It marks the division between wet and dry cultivation and between cultivation and waste, distinguishing heavy jungle from scrub or sandy waste.

2. The boundaries of Zemindaries are demarcated and laid down, but not the boundaries of villages in Zemindary land, as explained in my letter to you, No. 113-4, of the 21st January 1869, paragraph 4.

3. In wild hilly and jungly tracts the scale is diminished one half.

4. Talook maps on the scale of 1 inch to the mile have been prepared in manuscript by reduction from the Village Maps* in 53 talooks, comprising an area of about 25,000 square-miles. There are, however, only 21 of these which can be called complete, as in most cases there are unsurveyed blocks within their limits. We are, however, making good progress in the districts marginally noted towards filling up the gaps in these maps, somewhere about 2,000 square-miles of country having already been surveyed on the 4-inch scale. As each talook is completed I shall be in a position to have the map printed. This I have been averse to doing long as so many unsurveyed patches existed. I have, however, been obliged to print the incomplete maps of some talooks to meet the calls for Topographical Maps.

*2,356.

Ganjam.	Coimbatore.
Nellore.	Tinnevelly.
Salem.	Madras.

No. 103. ORDER THEREON, 8th August 1870, No. 1,185.

Land Revenue.

RESOLVED that the foregoing letter be communicated to the Government of India, with reference to their Secretary's (Home Department,) letter, dated 26th October 1869, No. 373, and with an expression of the opinion of this Government that the existing arrangements for the preparation of maps are sufficient.

(True Extract.)

(Signed) H. E. STOKES,
Under-Secretary to Government.

To the Superintendent of Revenue Survey.

Exd. F. R. Bantleman.

Govt. of India.

REVENUE.

To

THE SUPERINTENDENT

REVENUE SURVEY.

Dated Simla, the

Read

G. O., with enclosure [illegible]

AUGUST.

Nos. 102-103.

Organization of the Survey.—Letter from Superintendent of Revenue Survey forwarding further report on [illegible] this subject, communicated to Government of India with expression of opinion of this Government that the existing arrangements for the organization of troops are sufficient.

4. I beg to explain that there was not the slightest intention on my part of revising the old survey of the Nulgherry Mountains, executed by the late Lieutenant-Colonel Ouchterlony, as is distinctly stated by Colonel Saxton, whose memorandum appears to have been drawn up in ignorance of the real state and value of Colonel Ouchterlony's survey, as well as in excess of his instructions from my Office; and if I had ever seen the Deputy Superintendent's remarks, I should immediately have put them right, and prevented the submission to the Madras Government of a document so likely to cause the complications which have arisen.

5. The real object contemplated, and ordered by myself, was the extension of a few secondary triangles from the principal triangulation now being carried on by Captain Branfill, of the Great Trigonometrical Survey, in revising the southern section of the great Arc Series to join the new base line at Cape Comorin, so as to reach the eastern flank of the Nulgherry Hills, and to connect this old survey of Colonel Ouchterlony's with the general system of the Great triangulation of the present day; and at the same time to take up the chief points or hill stations of the Ootacamund Revenue Survey, now in progress under Major Keevey, whereby the three different operations executed at different intervals might by the most trifling expenditure of time and labor be amalgamated and combined with rigorous data on our own unit of measure for due incorporation into the Atlas of India.

6. This duty I deemed absolutely necessary and important with reference to the current operations of the Great Trigonometrical Survey in the southern peninsula, and to an officer of the experience of Colonel Saxton, in carrying on secondary triangulation, and equipped and ready on the spot as he was, proved of the most trifling character. The Deputy Superintendent, on his return from his own field of survey in Dindigul and Coyapore to his recess quarters at Ootacamund, commenced this connecting link of a few triangles in March, and completed the whole thing in about

about six weeks time, or by the end of May last, and nothing further in the shape of field work is intended. It was succinctly described in my last Annual Operation Report dated the 15th January last, paragraph 122, page 28, and I again quote it for facility of reference.

Extract paragraph 122

Finding a very elaborate survey of the station or sandalcum of Ootacamund far advanced on a large scale for local purposes under the Madras Revenue Surveys, I directed Colonel Saxton to adopt measures and process, on his return from the field, to execute some principal triangulations by which the Nulgherry Hills may be duly connected with the great triangulation of the great Trigonometrical Survey now passing down the meridian of 78° on the great Arc series of India. It is very important that the old survey of the Nulgherry Mountains by the late Captain Ouchterlony should be identified and connected with the principal triangulation; by incorporating all these surveys in one standard of comparison and connecting them together, great advantages will accrue and facilities be afforded for filling up the sheets of the Atlas of India with rigorous accuracy, which cannot be done at present. This duty is of very trifling character, and can easily be performed by the Deputy Superintendent during the recess months without additional expense.

7. The reason of my taking these precautionary measures was obvious. The old Nulgherry survey, executed by Captain Ouchterlony, was conducted under the special orders of my predecessor many years ago, and before that portion of the peninsula was covered with any series of the great triangulation conducted according to the principles and with the instrumental equipment of the present day, and because no reliable data of any sort had been furnished to my department by the Madras Revenue Department, the nature of whose operations are of a cadastral and detailed character, and the results of whose labors, from the commencement of their undertaking now some twelve or fourteen years ago, have not contributed in the smallest degree either to the geography of the Madras Presidency, or to the topographical connection of any surveys or districts in a complete and systematic form that I am aware of.

8. This subject, which is of great importance to the Geography of India, and to the leading duties of the Surveyor General, was prominently brought to the notice of the Government of India in my letter marginally cited, and again referred to in paragraph 25 of my last annual report.

No 1697, dated 2nd Octobr 1863

9. My printed report, I may state, was duly furnished to the Madras Government and a copy has likewise now been forwarded to the Superintendent

dent Madras Revenue Surveys; and I am quite satisfied that on a perusal of my explanation, that officer's fears as to any undue interference with the revenue surveys in the Madras Presidency, will be entirely dispelled.

10. It is by no means necessary on this place to go into the history or merits of the old survey of the Neilgherry Hills by the late Colonel Cuchterloney carried on between the years 1834 and 1851, the whole of the records of which are now in the Office of the Superintendent of the Great Trigonometrical Survey at Deha. I have referred to much correspondence and many documents on the subject, and I find that the operations were stopped by the Madras Government before the survey was completed, much to the regret and against the remonstrance of the late Surveyor General. The triangulation, no doubt, was of an inferior order, and unfit for the purposes of extension, although of sufficient accuracy for the incorporation of its own topography into geographical maps on a small scale; and as nearly 20 years have elapsed, during which many alterations have probably taken place, the survey can hardly be expected to satisfy the requirements of the present day.

11. This I conclude, must be the reason of its having been taken up again by the Madras Revenue Survey Department, who are stated to have instituted a scheme for the entire re-survey, and are now actually engaged on operations which embrace about a fifth of the whole station.

12. It was on this account that I directed, not the revision of such survey (for by revision may be understood the examining and improving of the old field work), but simply the due connection and identification of its principal extreme points with the great triangulation now passing in the close proximity, with the object of using and utilising its topographical details on a proper trigonometrical basis.

13. Had it not been for the circumstance of this new principal series passing through the Coimbatore District at the present time, no attempt could or could have been made by this Department to attain the object I had in view, and for which Colonel Saxton's services have thus been put into requisition for

for so short a period.

14. Owing to the want of this proper connection, Colonel Cuchterloney's materials, as he believed, have never to this day been brought into use in the No 61 of the Indian Atlas, which contains only Captain Ward's survey of the Coondahs and Neilgherries of a former date; and had not Colonel Saxton been on the spot to have performed the trifling and simple duty with which I entrusted him, it must have been carried out by Captain Branfill, as a supplementary secondary series to his principal Great Trigonometrical Survey operations down the Great Arc in which case the present objections by Colonel Priestley and the Madras Government would never have been heard of.

15. It is necessary that I should offer some remarks on the statements contained in the letters of the Secretary to Madras Government and of the Superintendent of Revenue Surveys. Nothing in the shape of "the appointment of an officer employed under the Government of India to supersede the existing arrangements for the survey of the Neilgherries" has taken place. Nobody has interfered in any way with the existing arrangements of the Madras Revenue Survey Department, and nothing of the sort is in contemplation; neither has Colonel Saxton in reality caused the smallest supersession of anything effected by the Madras survey, but quite the reverse. Although the Deputy Superintendent of Topographical Surveys has expressed himself, on his memorandum as intending to peruse Colonel Cuchterloney's survey, yet on fact he explains that he did not mean "to do over again anything already done by that officer;" the form used was, in fact, quite inappropriate to the matter in hand.

16. In short, Colonel Saxton's memorandum conveyed altogether such an erroneous and unfortunate impression, and is based on such incomplete information, not derived from this office, that although it met the approval and support of the Government of Madras in the first instance, and the necessary instructions were duly issued for affording the slight assistance asked for

-dent Madras Revenue Surveys; and I am quite confident that on a perusal of my explanations, that officer's fears as to any undue interference with his revenue surveys in the Madras Presidency, will be entirely dissipated.

10. It is by no means necessary in this place to go into the history or merits of the old survey of the Neilgherry Hills by the late Colonel Cuchterlaney carried on between the years 18[illegible] and 1851, the whole of the records of which are now in the Office of the Superintendent of the Great Trigonometrical Survey at Ootacamund. I have referred to much correspondence and many documents on the subject, and I find that the operations were stopped by the Madras Government before the survey was completed, much to the regret and against the remonstrance of the late Surveyor General. The triangulation, no doubt, was of an inferior order, and unfit for the purposes of extension, although of sufficient accuracy for the incorporation of the topography into geographical maps on a small scale; and as nearly 20 years have elapsed, during which many alterations have probably taken place, the survey can hardly be expected to satisfy the requirements of the present day.

11. This I conclude, must be the reason of its having been taken up again by the Madras Revenue Survey Department, who are stated to have instituted a scheme for the entire re-survey, and are now actually engaged on operations which embrace about a fifth of the whole plateau.

12. It was on this account that I directed, not the revision of such survey (for by revision may be understood the examining and improving of the old field work), but simply the due connection and identification of its principal extreme points with the great triangulation now passing in its close proximity, with the object of using and utilising its topographical details on a precise trigonometrical basis.

13. Had it not been for the circumstance of this new principal series passing through the Coimbatore District at the present time, no attempt would or could have been made by this Department to attain the object I had in view, and for which Colonel Saxton's services have thus been put into requisition for

for so short a period.

14. Owing to the want of this proper connection, Colonel Cuchterlaney's materials, as you believed, have never to this day been brought into use in sheet No 61 of the Indian Atlas, which contains only Captain Ward's survey of the Wynaad and Neilgherries of a former date; and had not Colonel Saxton been on the spot to have performed the trifling and simple duty with which I entrusted him, it must have been carried out by Captain Beaufill, as a supplementary secondary series to his principal Great Trigonometrical survey operations down the Great Arc, in which case the present objections by Colonel Jacob and the Madras Government would never have been heard of.

15. It is necessary that I should offer some remarks on the statements contained in the letters of the Secretary to Madras Government and of the Superintendent of Revenue Surveys. Nothing in the shape of "the appointment of an officer employed under the Government of India to supersede the existing arrangements for the survey of the Neilgherries" has taken place. Nobody has interfered in any way with the existing arrangements of the Madras Revenue Survey Department, and nothing of the sort is in contemplation; neither has Colonel Saxton in reality caused the smallest supersession of anything effected by the Madras surveys, but quite the reverse. Although the Deputy Superintendent of Topographical Surveys has expressed himself, in his memorandum as intending to supersede Colonel Cuchterlaney's survey, yet on fact he explains that he did not mean "to do over again anything already done by that officer;" the term used was, in fact, quite inappropriate to the matter in hand.

16. In short Colonel Saxton's memorandum conveyed altogether such an erroneous and unfortunate impression, and is based on such incomplete information, not derived from this office, that although it met the approval and support of the Government of Madras in the first instance, and the necessary instructions were duly issued for affording the slight assistance asked for

for, yet on the representations made in Colonel Priestley's letter, a totally different view of the case appears to have been subsequently taken by the Madras Government, and a most unnecessary alarm expressed as to "the withdrawal of the Nilgherries from the scope of the Madras Revenue Survey Department."

17. With advertance to the 5th paragraph of the letter of the Secretary to the Government of Madras, the facts stated in my 7th and 8th paragraphs as to what the Madras Revenue Survey Department has already accomplished or rendered, will, I submit, sufficiently prove how necessary it is for the Surveyor General to anticipate and care for the absolute wants and requirements of his own Department, and for the geographical interests of India generally.

18. The absence of any connected topographical delineation of the country under treatment by the Madras Revenue Surveys, and the non-submission or publication of any maps of a geographical character up to the present date, is most severely felt; and, although the Competency of that Department is no way impugned or doubted, yet the action of the Surveyor General in the present instance, it must, with great deference and respect for the opinion of the Madras Government, as expressed in the final paragraph of the same letter, be maintained, has been in strict keeping with his legitimate duties as conducted by his predecessors and himself for very many years past and likewise exactly with what it must continue to be for the future.

19. The operations of my own Department, I must take leave to add have ever been most perfectly restricted to non-interference with the detail surveys and arrangements conducted under local or subordinate jurisdictions in every part of India. When the Madras Revenue Surveys were first started, I was called on to report as to the proper principles on which they should be carried on their equipment, and other important matters, and in the imperial interests of the state, I laid down certain normal conditions which are quite obvious, and which, if then hoped, would eventually lead to superior results being collected without unreasonable delay

for

20. For many years past it has been my great aim to cooperate with the Madras Revenue Survey Department, and I have frequently taken pains to tender any assistance in my power. I hope, therefore, it is not too much to expect reciprocal aid on their part. The interests of the Madras Revenue Survey are identical, in my mind, with those of the national survey of India, the idea of supplanting Colonel Priestley and his officers in the salubrious climate of the Nilgherries, or in his detail surveys, therefore, could never have entered into the imagination of either Colonel Saxton or myself, and I much regret that so much over sensitiveness should have been shown on such trifling causes.

21. The combination and publication of the Madras surveys on a rigorous basis in the Atlas of India, is however quite within the scope of my proper duties and should, I think, be an object of leading importance with Colonel Priestley, so that the results of his labors may be turned to some speedy practical account, and thus prove more to the credit of himself and the officers employed than it is possible they otherwise can be.

22. Without good triangulation, and the topographical delineation of those more difficult jungly, and hilly parts of the districts under revenue survey, it is not possible to attain this end; and in executing what I have now done, I am satisfied that I have rendered the Madras surveys a good service. Colonel Priestley should, I submit, gladly hail and receive whatever tends to the perfecting of his detail surveys, and to the capability of testing them by first class triangulation and data executed by my Department, which is the most appropriate for such work.

23. Colonel Saxton has submitted a report on this question cited

in

in the margin, from which it is only necessary to attach a few extracts

* No 67 dated 21st June 1873, paras 4, 9, 10, and memo. paras 4, 6 and 7.

regarding the precise value of the register of Arc-angles and heights of the old survey forwarded with Colonel Priestley's letter for the information of that officer, from which it will be sufficiently apparent that, although certain data existed for a portion of the Neilgherry plateau, yet it is of very low order and quite unsuited for the object in view to meet our present requirements. The sides of these triangles varying from 4 to 15 miles and upwards in length, were observed to minutes only, and show the large discrepancies in their common sides as per margin.

+ Errors	
35	feet in 13 miles
48	" 15 "
13	" 8 "
27	" 4 "
34	" 5⅓ "
46	" 6½ "

24. The value of the heights is also open to considerable discrepancy and it was on all these accounts that I deemed it conducive to place the matter beyond all doubt and uncertainty by connecting the Cochine flank of the Neilgherry plateau and the several surveys thereon in absolute accord with the superior triangulation of the present day, which accurately will give a different value to position of Coimbatore, the origin of the Old Survey and, in short is the only way by which a proper use can be made of the various surveys now in existence.

25. It appears from Colonel Saxton's statement that some minor triangles were executed in 1867 by Major Cossey Deputy Superintendent Revenue Survey, for the Neilgherry survey, a sketch chart of which has recently been furnished to Colonel Saxton, but without any numerical data. This triangulation is described as "based on sides of triangles of the Great Trigonometrical Survey." A skeleton chart, without the data, is not of much use, but if Colonel Priestley will do me the favor of furnishing this Department with the values of the sides of these triangles, shewing the initial Great Trigonometrical Survey data on which they are based, it may prove of advantage and facilitate the geographical compilations which we have in hand. Perhaps, had this important information been supplied to my Department before, it might have saved the labor entailed by Colonel Saxton's present employment. On this point, however, I am unable at present to judge, until I can examine the data which may be forthcoming.

26. I cannot refrain from expressing my opinion of the impropriety of executive officers submitting letters and memoranda on professional or departmental subjects, direct to the Government without the knowledge or approval of the Head of their own Department. If Colonel Saxton had made known his wants to my office, or even furnished me with a copy of his letter and memorandum to the Madras Government, I should have been able to have satisfactorily explained the matter at the time, and prevented the present reference. The fact of an executive survey officer being employed within the jurisdictions of another Government, ought not to exempt him from the rules and practices of his own Department, to which he ought to conform like every other officer. Unless this is done it appears to me that the Head of a Department cannot be held responsible for the administration which passes under his name. Colonel Saxton has long followed this course, but it appears so objectionable that I have interdicted the practice for the future.

27. I beg to solicit that the remarks which I have deemed it my duty to make on the above case, may be transmitted for the information of the Madras Government and of the Superintendent, Madras Revenue Survey, and that the general question raised in my letter*

* No 1687 dated 2nd September 1869.

before quoted, as to the great importance of our procuring some outturn from the Madras surveys which have now been so many years in hand, may meet with the early attention of that Government.

28 The original enclosures of your letter are herewith returned as requested — Copies having been retained for record.

I am &c

in the margin, from which it is only necessary to extract the tracks

*No 67 dated 22d June 1873, paras 4. 3, 10, and memo. paras 4. 6 and 7.

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*No 1687, dated 2nd September 1869.

and that the general question raised in my letter* before quoted, as to the great importance of our proceeding some outturn from the Madras surveys which have now been so many years in hand, may meet with the early attention of that Government.

28 The original enclosures of your letter are herewith, returned as requested — Copies having been retained for record.

I am Sir

Extract of a letter from Colonel G.F.C. Hacton. Deputy Superintendent of N°3 Topographical Party, Central Provinces and Vizagapatam Agency Survey, to the Surveyor General of India.

Para 4. In paragraph 4 you say, you never contemplated any "revision of Captain Auchterloney's work," the rest of paragraph 4 as well as every other intimation given of what you did contemplate, exactly coincides with all that I have done, and intended to do, and I can only understand your remark by supposing that the word "revision" is taken to mean something beyond what I understood by it. I never intended to do over again any thing already done by Captain Auchterloney, but without a "revision" that is a further examination and overlooking, I cannot see how the process of properly connecting it, and recompiling another map from it, can be done.

3. When I first contemplated undertaking the work upon which I have since been engaged, I did so entirely in the interests of the Department to which I have the honor to belong and with the object of utilizing for the benefit of the general public, the labors of the Officers of my own branch of the survey Department, particularly the surveys made by that distinguished officer, the late Colonel Auchterloney, of Madras Engineers. My propositions were viewed most favorably, not only by yourself, but by the Madras Government, and the Commissioner of the Nielgherries, as the annexed extract from demi-official notes, &c., will show. I was allowed to search the records of the late Surveyor Generals Department in the Chief Engineer's Office Fort St. George; and Colonel Orr, R.E. Secretary to the Government, Public Works Department, kindly accompanied and assisted me in the search and obtained some valuable information and papers; in fact, until the receipt of your letter I had no reason to suppose that my operations were viewed with disfavor by the Madras Government, and cannot but think that had Colonel Priestley's letter been sent home in the first instance for information, I could have easily removed that officers unfortunate misapprehensions that I was exercising any improper interference with his Department.

4. I trust that these proceedings may not be allowed to interfere with the completion of a work which must prove, when finished of great pecuniary and geographical importance, — I owe to the local officials and the general public, at any rate for the few years, Colonel Priestley says, he will remain to complete his survey. You are aware that the most difficult portion of my contemplated field work is completed, and the expenditure incurred has been defrayed and passed by yourself. Not a single subordinate surveyor has been taken from his ordinary work, and my field out-turn is complete and of larger amount than for any of the last few seasons. I have thus far entirely fulfilled the conditions on which I proposed the undertaking, both as to time and non-interference with my ordinary survey and the inexpensiveness of the work.

Extracts from a Memorandum in answer to remarks made by the Superintendent of Revenue Survey, Madras, in a letter dated 4th February 1870, No 267-10, addressed to the Acting Secretary to the Government, Fort St. George, Revenue Department, and forwarded with Proceedings of Madras Government, Revenue Department 15th April 1870, with that Department Secretary's letter N° 523 dated 13 April 1870.

Colonel Hacton's Statement

Scarcely anything is shown on the Atlas Sheet N°61, in the centre of which this District lies.

Colonel Priestley's remarks

There are certainly gaps in N°61 Sheet, but not in that part containing the Neilgherries, and even if there were, they might, I imagine, be filled up from Colonel Auchterloney's survey. The places in which the maps is bare are along the Bowany River, in the Nelumboor and Wynad forests, and within the Mysore frontier.

1. These remarks are altogether beyond the mark, as my statement concerns nothing excepting the survey and map of the Neilgherries, and of that plateau, the important places, "Coonor," Wellington, and

Koteygiery.

"Kotergherry," are, not shewn in Atlas Sheet No 61, and of so little value is that map for general purposes that the Commissioner of the Province had not one. I do not consider it necessary to refer to Colonel Priestley's letter further. The operations I have received orders to carry out in no way interfere with any work required to be performed by his Department, and it will be a matter of no concern to me whether he takes advantage of my triangulation, or, on the completion of his new map in a few years, should prefer to base it on the existing triangulation.

6 In the matter of heights, I beg to place on record, for the information of the Madras Government, what Colonel Priestley omitted to do, that the list of heights he has discovered contains only two instances of the height given, being tested by a second value for the same place, and in one of those instances the values are discrepant to the extent of nearly 200 feet— "Daverbetta" being computed as 6656.7 and 6460.2 feet above the sea. Such results are quite worthless for the requirements of this day, and stamp the whole of the Trigonometrical operations from which they come, with a character only suited to the time they were conducted, which was previous to 1822, and even then it is clear that they cannot belong to a survey with any claim to scientific accuracy.

7. I would here thankfully acknowledge the unqualified and ready assistance rendered me, with but one exception, and would add, with reference to that one, that the work upon which I am engaged will in no wise detract from the credit to be awarded to the meritorious labors of the officers of the Madras Revenue Survey Department, and cannot tend, as Colonel Priestley seems to anticipate, to the exclusion of his Officers from the plateau of the Neilgherries as a scene of their surveys. Our work is separate in its nature and details undertaken with different objects, and all conclusive to the advantage of the State, and the welfare of the country generally.

(True Extracts)
(Signed) H. L. Thuillier, R. A.
Surveyor General of India

Sel. G. Notes 3417/73

12 / 2084/73

P.G. Nos. May/74 13 No. 135.

Simla 1870 Dept.

(Geographical)

From
The Surveyor General of India
No. F. 283.
1 Enclosure
2 Fair Copies

Dated 2nd } August
Recd. 8th } August

D. No. 259 } Regr. { D.
L. No. 254 } Regr. { No.

Acknowledges the receipt of the office docket No. 180 dated 18th May last with its original enclosures from the Superintendent Madras Revenue Surveys regarding a supposed re-vision of the old survey of the Neil-gherry Hills, executed by the late Lieut Col. Ouchterlony. Explains the action of Col. [illegible], remarks on the statement of Col. Priestley and the Madras Government, and returns the original enclosures — six in number.

Geographical — April 22, 1871

No. 324 dated the 22nd February 1871

From,

Colonel H. L. Thuillier C.S.I.
Surveyor General of India

To,

E. C. Bayley Esqr. C.S.I.
Secy. to the Govt. of India

With reference to previous correspondence cited in your letter No. 429 dated the 2 November last, and to the orders therein contained to submit "a scheme on an economical scale such as might be considered when the finances of the Empire are in a position to bear the additional expense for carrying out the proposals made for the utilisation of the available Geographical information for the preparation of maps of the Madras and Bombay Presidencies, and for Topographical surveys for such of the districts as still remain unsurveyed" to complete the Atlas of India, I have the honour to report as follows:

2. In the Madras Presidency

Then

there is a professional officer the Superintendent of the Rev: Survey whose duty it should be to generalise & reduce his own Surveys which are being made on a proper system Until certain progress has been made in the Surveys of the Extensive Islands so unfortunately left in the various districts which have already come under the Rev: Survey

No 536 F.
Dated 9th October 70

operations and do referred to in my letter marginally cited Colonel Priestley cannot of course absolutely complete any district map but it seems to me possible to make a beginning with much of the Area already effected & thereby to utilize some additional establishment for the purpose of compilation, preparation and publication of the Geographical results of his Survey. That Officer can alone state whether any or what progress has already been made

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made or can be effected in starting such work at present with the new Survey materials at his disposal.

3. There can be no doubt as stated in my former letter that it is high time some of the Revenue Surveys of the Madras Presidency were brought into useful form for Geographical purposes and the materials incorporated in new Editions of the sheets of the Atlas of India. Until Colonel Priestley will give us maps with the data of the one inch and quarter inch scales, nothing can be done towards the object in view.

4. I would therefore suggest that a general Report be called for from the Superintendent of Madras Revenue Survey on this subject to show the number of districts partially completed up to date and the Area already surveyed, also whether he is in a

position

there is a professional officer the Superintendent of the Rev: Surveys whose duty it should be to generalise & reduce his own surveys which are being made on a proper system. Until certain progress has been made in the surveys of the Extension Islands unfortunately left in the various districts which have already come under the Rev: Survey

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3. There can be no doubt as stated in my former letter that it is high time some of the Revenue surveys of the Madras Presidency were brought into useful form for Geographical purposes and the materials incorporated in new editions of the sheets of the Atlas of India. Until Colonel Priestley will give us maps on the data of the one inch and quarter inch scales, nothing can be done towards the object in view.

4. I would therefore suggest that a general report be called for from the Superintendent of Madras Revenue Surveys on the subject to show the number of districts partially completed up to date and the area already surveyed, also whether he is in a positi

position at the present moment to
commence the reduction and
compilation of his district maps and
what additional establishment
he requires for the purpose.

5. The Supdt. of Madras Trigsurvey
has avowedly very heavy duties to
perform in regard to settlement
or demarcation as well as cadastral
measurements and the existing esta-
blishments, I believe, is not in no
way calculated or intended
for the very heavy task which now
devolves of bringing so many years
surveys into a tangible state for Geo.
graphical purposes. The indebtedness
and requirements of the settlement
it is admitted are very great but
I submit that that is no reason
whatever for the suspension of the
due preparation and publication
of maps such as we now allude to
which ought to be rendered available
within a reasonable period from
the time survey and it will be
true economy in my opinion to give
Colonel Pringle the proper means to
endeavour to bring up some of the
heavy arrears of mapping on the
smaller scales which forms a great
desideratum after so many years of
survey.

6. The state of the Madras Pres-
idency is altogether different from
that of Bombay in the former we
have both the topographical survey of a proper
character going on and also the whole
of the Atlas sheets of the Southern Penin-
sula published from the old
Military Institution Survey so
that there is no object whatever in
Madras of compiling and putting
together for temporary purposes
desultory and incongruous materials
which would be tedious as well as ex-
pensive and of no use.

We must therefore if a Deputy
Surveyor General be previously recom-
mended cannot be sanctioned
rather endeavour to assist the aid of
the Trigsurvey Superintendent of
the Madras Presidency to render the
results of his recent surveys as speedily
available as possible and the Gov.
of India having admitted the
necessity of some additional Esta-
blishment for that purpose it
rests with the Madras Superintendent
to propose what he may deem
needful and appropriate

8. If a special officer cannot
be sanctioned for such a purpose

a

as seems to me most desirable and effective, then a Departmental officer of a qualified grade might be trained for the sole purpose of furthering the Geographical Maps and devoting his attention entirely to the working up of the survey materials and providing the necessary numerical data for the same.

9. I have no knowledge of the actual state of these Revenue Surveys in Madras. The annual administration Reports of the same are not sent to me regularly and I have not been received for a long time past but if the Govt of India think it desirable I can personally enquire into the subject during the ensuing recess. If no Officer of Survey General is appointed to them the sooner the final results of these surveys are placed under Surveyor General and his Department or within his cognizance, the better it will be for the interests of the state. My sole object is

to strengthen the hands of the Madras Superintendent of Revenue Surveys and to meet the wishes of the Secretary of State for India.

Comp.d G.P.

Geographical.
November 26th 1870 No 553.

Dated Mussoorie, the 7th October 1870.

From

Colonel H. L. Thuillier R.A.
Surveyor General of India

To

E. C. Bayley Esquire C.S.I.
Secretary to the Government of India

I have the honor to acknowledge the receipt of the letter of the Secretary to the Government of Madras cited in the margin, with enclosure, from the Superintendent of Revenue Surveys Madras, under cover of your Office docket No 330 dated 7th September last with a request for a report.

No 1186 dated 8th August 1870

2 The subject entered into by the Superintendent of Madras Revenue Surveys appears to have reference to my report on the Madras Surveys of the 2nd September 1869 (and not to the formal transmitting document quoted in your docket) and as adverted to in the 25th paragraph of my last printed Annual Report.

No 1687

3 In the Resolution of the Madras Government on Colonel Priestley's letter it is

is stated that the subject is in reply to Home Department No 373 dated 26 October 1859.

4 Colonel Priestley has described the means now taking to fill up the district maps of the Madras Revenue Surveys which appears highly judicious and proper. It is very satisfactory to find that something practical and useful for geographical purposes is likely to be done after so many years of progress of these Surveys. The only regret is that a continuous and systematic procedure in taking up what are termed Zemindaree lands, or in filling up the gaps now referred to, was not followed in the first instance; or certainly some years ago.

5 It will be money well laid out if the hands of the Superintendent of Madras Revenue Surveys are strengthened, so as to enable him to make good progress with the 4 inch scale Survey of the Zemindary blocks, whereby the Revenue Survey materials lying idle may be utilized for geographical purposes and complete district maps on a tangible scale rendered.

6 In the dispatches of the Secretary of State, recently received in reviewing the Survey operations for the past

No 16 dated 2nd August 1860 "Para 4 – Col Thuillier after a tour of inspection, appears to have submitted certain recommendations with reference to the organization & operations of the Survey Depts of the Madras & Bombay Presidencies. I presume that this subject is now under your consideration and shall be glad to receive an account of your proceedings, and of those of the Local Governments with whom you will have been in communication.

season, the remarks as per margin are made, which evince the importance placed on the early reduction, combination and publication of all Survey materials and I trust that the subject may be preped on the attention of the Madras Government so that the existing arrangements which are declared sufficient for the preparation of geographical maps may not be indefinitely delayed.

7 Colonel Priestley's letter being, it is concluded, a reply to my report on the Madras Surveys, which contained all that I have to say on the subject, I have no further report to offer on the present occasion; but would venture to impress the fundamental principles inculcated in my original report on the Madras Revenue Surveys No 13 dated 6th May 1857 with the view to the speedy generalization of those operations.

8 The original enclosures of your docket are herewith returned as requested, copies having been taken for record.

Compd GK

Proceedings of the Madras Government, Revenue Department,
17th May 1873.

No. 114. Read the following letter from C. J. LYALL, Esq., Officiating Under-Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, (Surveys,) to the Hon. W. HUDLESTON, Chief Secretary to the Government of Madras, dated Simla, 9th May 1873, No. 325 :—

I AM directed to inquire what geographical materials are available from the Madras Survey, and to request that, with the permission of His Excellency the Governor in Council, you will favour the Government of India with any maps that may have been constructed other than village maps by the Madras Survey.

2. The Governor-General in Council will also be glad to learn what work has been done apart from Revenue Survey work in the way of topography and mapping, and to receive any reports that would give him information on this point.

No. 115. ORDER THEREON, 17th May 1873, No. 495.

Miscellaneous.

FORWARDED to the Superintendent of Revenue Survey for early report.

(True Extract.)

(Signed) R. A. DALYELL,
Acting Secretary to Government.

To the Superintendent of Revenue Survey.

Esd. F R. Bantleman.

Govt. of India
REVENUE.
To
THE SUPERINTENDENT OF
REVENUE SURVEY.
Fort St. George
Dated May 17th. 1873.
Rect.
Ack.
G. O., 17th May 1873, No. 403.
MAY.
Nos. 114-115.
Geographical Materials from Madras
Survey.—Letter from Government of India,
requesting information in connection with it,
forwarded to the Superintendent of Revenue
Survey for early report.

Revenue Survey Office,
OOTACAMUND
12*th June* 1873.

10

62

Years.	Districts.	Area Sqr. Miles.	Total	Remarks.
1873/74	Tinnevelly	4676		
	Trichinopoly	3515		
	Chingleput	2753		
	Nellore	8462		
	Kurnool	7358	26764	Nallamallai range incomplete.
1874/75	Kistnah	8036		Revenue Survey completed.
	Salem	7483		Do.
	Godavery	6224	21743	Do.
1875/76	Coimbatore	7432		
	Neilgherries	749		
	Wynaad	600	8781	
1876/77	Cuddapah	8367		
	North Arcot	7139		
	Ganjam	4000	19506	
Commenced	Madura	9502		
	Bellary	11007		
	South Arcot	4873	25382	
Not Commenced	Vizagapatam	5303		
	Malabar	5500		
	South Canara	3902	14705	
Excluded	Tanjore	3654		

I have &c. &c.
(Signed) F. PRIESTLEY *Colonel*,
Superintendent Revenue Survey.

Revenue Survey Office,
Ootacamund
12th *June* 1873.

No. 1333/40

From

The Superintendent Revenue Survey.

To

The Secretary to Government
Revenue Department.

Sir,

I have the honour to acknowledge the receipt of G. O., dated 17th May 1873, No. 495 calling for information regarding Geographical Materials available from the Madras Survey and the progress made in the topographical surveys of this Presidency.

2. In my letter dated 20th July 1872 No. 1581/45 I gave full information on these points and others connected with the Madras Survey and I was in hopes that it would be communicated to the Supreme Government as it was submitted in reply to Resolution of that Government dated 13th May 1872, No. 301 making a somewhat similar, but more comprehensive call. I sincerely trust that the Supreme Government may not in the absence of information deal summarily with the topographical portion of the Madras Establishment as they have already done with the Civil pay of Military Officers in the Department. In this case a general break up may be anticipated and the Department to the construction of which I have devoted the last twenty years, I shall have the mortification of seeing totally overthrown from no shortcomings or misconduct on my part, but simply for want of the support and assistance I think I had every reason to look for at the hands of Government.

G. O. 13th. January 1873, No. 63.
From Superintendent Revenue Survey to Secretary to Government 31st January 1873, No. 307/9.

3. I beg to submit a list of Maps other than Village Maps for transmission to the Government of India and also a Memo of the probable dates on which District Maps on the scale of 2 miles=1 inch will be ready. This memo is however merely an estimate. Many unforseen circumstances may occur to render it incorrect. The refusal of the Supreme Government to sanction an additional Topographical Establishment, the estimate for which was submitted pursuant to their own order, and the negative to my application for a manipulator from Southampton are both drawbacks, on the other hand our having been able, in spite of all obstacles, to start Photo-Lithography successfully is in favour of the estimate being correct.

Dated 13th May 1872 No. 301

Pay Rs. 150.

4. I venture to avail myself of this opportunity to solicit the Orders of Government on my proposals contained in letters dated respectively 22nd May 1871, No. 1138/42 and 20th July 1872, No. 1581/45, of which I beg to enclose duplicate copies.

I have &c. &c.

(Signed) F. PRIESTLEY *Colonel*,
Superintendent Revenue Survey.

Statements to accompany the report of Survey operations from the beginning to the end of 1872.

SURVEY.

1. Comparative Statement shewing the increase in area brought to credit by Revenue Survey.
2. List of all Districts in the Presidency with area surveyed and in progress.
3. List of Districts undertaken by survey with area surveyed, expenditure and cost per square mile.
4. Statement of area surveyed and cost incurred annually.
5. Table to exhibit variation in cost of survey per square mile in certain talooks.
6. Tabular statement to shew the variation in Establishment to suit temporary exigencies.
7. Statement of charges originally excluded from estimates but subsequently debited to survey funds.
8. List of Grand Trigonometrical Stations connected with Revenue Survey.
9. Number of Minor fields measured and sketched.
10. Field book ($\frac{1}{4}$ size foolscap.)
11. Field book (full size foolscap.)

DEMARCATION.

I. Area demarcated by Survey Department and cost incurred annually.

II. Area demarcated and expenditure incurred by Districts with cost per square mile.

LITHOGRAPHY.

Statement shewing the extent lithographed and cost incurred annually.

B.—*Statement showing distribution of Out-door Survey Deparment and Work achieved and to be done in each District on the 31st December 1872.*

Name of District.	Number of Party.	Date of commencement.	Area for		Total area.	Surveyed.		Total area.	To complete.		Total area.
			Revenue Survey.	Topographical Survey.		Revenue Survey.	Topographical Survey.		Revenue Survey.	Topographical Survey.	
			SQ. MILES.	SQ. MILES.	SQ. MILES.	SQ. MILES.	SQ. MILES.	SQ. MILES.	SQ. MILES.	SQ. MILES.	SQ. MILES.
South Arcot	Tentative Survey Party and No. 1 Party.	May 1853	2,814	2,059	4,873	514	...	514	2,300	2,059	4,359
Trichinopoly	No. 1	February 1856 ...	2691	982	3,673	2,691	248	2,939	...	734	734
Salem...	Do.	June 1859	3606	3,877	7,483	3,606	925	4,531	...	2,952	2,952
Coimbatore...	Nos. 1 and 4...	Do. 1861	3329	2,103	7,432	3,594	51	3,645	1,735	2,052	3,787
Godavery...	No. 2	March 1858	2874	3,350	6,224	2,874	518	3,392	...	2,832	2,832
Kurnool	Do.	June 1862	5110	2,248	7,358	5,110	657	5,767	...	1,591	1,591
Bellary	Do.	December 1872 ...	7147	3,860	11,007	...	...	...	7,147	3,860	11,007
Kistna	No. 3	January 1859 ...	5296	2,740	8,036	5,296	1,082	6,378	...	1,658	1,658
Cuddapah	Do.	June 1865	4652	3,715	8,367	2,452	432	2,884	2,200	3,283	5,483
Tinnevelly	No. 4	July 1863	2810	2,366	5,176	2,810	1,750	4,560	...	616	616
Madura	Do.	June 1872	2277	7,225	9,502	90	...	90	2,187	7,225	9,412
Nellore	No. 5	March 1861	4213	4,249	8,462	4,213	4,249	8,462	...	...	...
Chingleput...	Do.	January 1867 ...	2093	741	2,834	2,093	741	2,834	...	...	...
North Arcot	Do.	April 1872	2119	4,520	7,139	19	91	110	2,600	4,429	7,029
Ganjam	No. 6	September 1866...	1,72	7,141	8,313	772	596	1,368	400	6,545	6,945
Wynaad (Malabar) ...	Nos. 4 and 1...	October 1859 ...	36	924	1,160	186	5	191	50	919	969
Nilgiris	No. 1 Detachment.	February 1866 ...	66	683	749	38	83	121	28	600	628
Madras Town	.....	.....	27	...	27	27	...	27	...	...	...
Total...	.....	.....	55,32	52,783	1,07,815	36,385	11,428	47,813	18,647	41,355	60,002

A.—*Statement showing the cost of the Survey Demarcation and Central Office Establishments of the Department at the close of the last year* (1872.)

Out-door or Survey and Demarcation and Office Establishment.			In-door or Office, Draughtsmen, etc., etc., Establishment.		
Designation.	No.	Annual salary.	Designation.	No.	Annual salary.
Survey.		Rs.	*Head Office.*		Rs.
Officers	11	70,212	Superintendent	1	21,936
Sub-Assistant and Surveyors.	304	1,57,084	Office Assistants	2	4,800
Ameens (Field Surveyors) ...	641	79,296	Clerks and Computers ...	19	4,092
Gumastahs	1,201	93,384	Draughtsmen	13	4,140
			Servants	14	1,200
Total...	2,157	4,05,912	Total ..	49	36,168
Demarcation.			*Lithographic Department.*		
Officers	3	23,076	Head Draughtsman	1	1,800
Inspectors	10	7,440	Draughtsmen	80	11,004
Demarcators	198	46,200	Printers and Servants	80	6,312
Servants	185	12,792	Total...	161	19,116
Total...	396	89,508	Any other Establishment without too great detail	...	...
District Offices.					
Officers	5	40,620			
Writers and Computers ...	119	33,576			
Draughtsmen	200	55,476			
Servants	72	5,520			
Total...	396	1,34,592			

Abstract.

	No.	Annual salary. Rs.
Survey	2,157	4,05,912
Demarcation	396	89,508
District Office	396	1,34,592
Head Office	49	36,168
Lithographic Department ...	161	19,116
Other Establishment	...	...
Total...	3,159	6,85,296

Chepauk,
10th July 1873.

(Signed) F. J. B. PRIESTLEY,
Supt. of Revenue Survey.

1

To be published for Bonus Proceedings of the same date and number.

No. 1,729.

Proceedings of the Board of Revenue, dated 2nd September 1873.

Read the following letters :—

From Colonel F. J. B. PRIESTLEY, Superintendent of Revenue Survey, to J. GROSE, Esq., Secretary to the Board of Revenue, dated Chepauk, 4th June 1873, No. 1,316-58.

Referring to the orders of Government as per margin, and to the Proceedings Board of Revenue, No. 1,323 of the 27th March 1871, I have the honour to submit, for transmission to Government, with such remarks as the Board may wish to offer, four copies of a report on the constitution and work of the Revenue Survey Department up to 31st December 1872.

Dated 28th June 1870, No. 958.
" 28th February 1873, No. 238.

2. The submission of this report has been delayed up to date, in the hope that the tables enumerated in the accompanying list might be forwarded with it; but, as full information especially of assessed areas and minor fields is not yet available, I have thought it undesirable to delay the report any longer.

3. Four copies of each of the tables will be forwarded as they are completed.

4. I enclose copy of a letter from the Secretary to the Government of India, Department of Agriculture, etc., referred to in G. O., No. 238, of 28th February 1873.

No. 301 of 13th May 1872.

5. The Director Revenue Settlement has been furnished with two copies of this report which he has been requested to submit to the Board with his remarks.

Enclosure No. 1.

An account of the Madras Revenue Survey Establishments, of the work performed by them, and of their present operations, submitted in obedience to G. O., dated 20th May 1872.

1. Introduction.—In 1858, the only maps of the Presidency in existence were those prepared by the Military Institution from which the sheets of the Atlas of India had been compiled, and maps of individual Collectorates on a small scale. A Revenue Survey had not been attempted. In almost every part of the Presidency, there had been a Paimash or recorded measurement by pole which, in official records, was often called a survey. The Paimash or Survey varied, in accuracy, in different districts. It had, in no district, been conducted on European principles of surveying, nor had, in any case, maps been prepared showing the position and extent of the land measured.

2. In some district, the Paimash had become almost totally useless. In every case, the Revenue authorities were completely at the mercy of the Curnam, who interpreted the Paimash records as he thought fit.

3. A measurement through the centre of a field from north to south, and another through the centre from east to west, together with the numbers of adjoining fields, were the only records by which any particular plot of land could be identified.

4. For many years, a Revenue Survey had been in progress in the Bombay Presidency. A Revenue Survey had been carried on in the North-West Provinces and in Bengal.

5. The principles on which the surveys abovementioned had been conducted did not appear suited to the peculiar circumstances of this Presidency. In the North-West and in the Bengal Presidency, the accuracy of measurements of individual fields seemed not to be sufficiently considered. In Bombay, the importance of making a Revenue Survey useful for geographical purposes appeared to have been lost sight of.

6. EXPERIMENTAL SURVEY.—The services of Captain Priestley of the 25th K. O. B. were, in the year 1853, placed at the disposal of the Revenue Board in view to his training a Survey Class, and submitting, for the approval of the Board and Government, maps of villages surveyed under certain conditions laid down by them. Surveyors were so scarce that the only persons who had any knowledge of surveying, and who were available, were a superannuated Plane Table Surveyor, formerly in the Topographical Survey Department, and a young Ordnance Artificer trained in the school of that department. Captain Priestley commenced work in the South Arcot District. After the survey of several villages had been completed, the maps and records were sent for the inspection of the Revenue Board.

		Rs.	A.	P.
1	Captain F. J. B. Priestley ...	200	0	0
1	Mr. McMahon, Surveyor ...	265	10	0
1	Mr. Starr, Superintendent ...	50	0	0
14	Karcoons at 17½ Rs. each ...	245	0	0
14	Do at 12 Rs. „ ...	168	0	0
2	Writers at 12 Rs. „ ...	24	0	0
1	Plan Drawer at 17½ Rs. } 1 Do. at 12 Rs. } ...	29	8	0
1	Goomastah	15	0	0
1	Duffadar or Head Peon	6	0	0
12	Peons at 4 Rs. each	48	0	0
	Total...	1,051	2	0

7. With the exception of Captain Priestley's proposal to connect his work with the Great Trigonometrical Survey, and of some arrangements he had been compelled to adopt for want of suitable* instruments and establishment, the system on which he had been working was approved by the Board and may be briefly described as follows:—

I. *Selections from the Records of the Madras Government, No. IX.*—To have the village boundaries of a taluq marked out by the Revenue authorities and permanent pillars of masonry erected at each Theodolite station.

II. To lay out grand circuits of 50 or 100 square miles and survey the boundaries of villages and sub-divisions of villages within them by Theodolite and chain, ascertain the true bearing of lines at intervals by observation, plot on the scale of five chains = 1 inch and compute the content (in acres) of the village and subdivisions by traverse. Plot the fields (of two acres and upwards) measured by chain within the boundaries of villages and their sub-divisions.

III. The test of the correctness of field measurements was their plotting exactly into the boundary laid down beforehand; of field areas, their gross content equalling the area by traverse.

* NOTE.—The largest Instrument in Captain Priestley's possession was a five inch Theodolite. He was provided with brass chains made at the Gun Carriage Department for traversing, and bamboo poles of twenty-four feet for field measurement.

IV. The Topographical details and such parcels of land as did not admit of Khusreh or detailed field measurement by chain alone to be laid in by chain and compass, the expense of Topographical survey being merged into that of the Khusreh.

8. This system with slight modifications and improvements has continued to the present day.

9. *Selections from the Records of the Madras Government, No. LIII.*—The Deputy Surveyor-General in a letter to the Government of India, reviewing the tentative operations in South Arcot during 1853 and 1854 reported on in Selections from the records of Madras Government, No. IX., points out the necessity of connecting any survey in Madras with the great Trigonometrical Survey Stations, of working on a true meridian, of making provision for a topographical survey of such lands as are not included in the fieldwar survey; and remarks the total absence of any establishment or machinery for demarcation. In all other respects, he considers the Madras system worthy of admiration.

10. TEMPORARY ESTABLISHMENT.—A temporary establishment under Captain Priestley was sanctioned by the Supreme Government for two years and* two officers were attached to the party to be trained in the method of working. In granting sanction† however, it was observed by the Governor-General in Council that "His Lordship's only doubt in respect to the scheme of survey has arisen from the known difficulty of plotting fields from a Khusreh Amin's return within an exterior boundary laid down by scientific survey.

* Lieutenant Hessey, 21st N. I., and Pratt, 84th Foot.

† G. O. G. I. No. 3420, dated 8th Sept. 1854.

	Rs.	A.	P.
1 Captain F. J. B. Priestley...	575	0	0
2 European Assistants ...	400	0	0
1 Mr. Starr, Head Surveyor...	70	0	0
2 Head Surveyors or Artificers at 70 Rs. each	140	0	0
6 Deputy Surveyor at 30 Rs. each	180	0	0
30 Survey Amins from Rs. 17½ to Rs. 20	562	0	0
30 Amins and Goomastahs at 10 Rupees each	300	0	0
8 Writers, 25 Rs. each ...	75	0	0
3 Draughtsmen, 20 Rs. each..	60	0	0
3 Duffadars, 7 Rs. each ...	21	0	0
126 Measurers from Rs. 4 to 5.	528	0	0
3 Computers, 20 Rs. each ...	60	0	0
18 Peons from Rs. 5 to 7 ...	96	0	0
Travelling allowance or tentage and batta to Head and Deputy Surveyors, Amins, and Goomastahs	225	0	0
	3,292	8	0
Additional Contingent charges.	37	8	0
Total per mensem...	3,330	0	0
For 12 months...	39,960	0	0
Deduct two months' batta not drawn	450	0	0
Net Amount...	39,510	0	0

11. This establishment was maintained till 7th March 1858, and turned out work at an average cost of Rupees 86-3-5 per square mile.

Square miles 1293.

12. The method of field measurement proposed by Captain Priestley and described at page 40 of Sel: Rec: Madras Government, No. IX., under the title of the "*Combined method*" was tried by this temporary establishment. It consisted in measuring the fields by chain and cross staff and plotting them within a boundary already drawn beginning at a corner of the boundary and continuing to plot from the boundary inwards. It was not found so suitable as that of measuring four sides and a diagonal, being incomprehensible to the ryots who raised objections to it and to offsets being taken through standing crops, &c. It was more difficult to train men to it, and unless the measurement and offsets were very accurate, the plot would not close.

13. In his report on the work of the survey during 1856, the Officer in charge mentions that the boundary demarcation was performed in so unsatisfactory a manner by the Taluq authorities that he was compelled to set on foot a small establishment for the purpose, from among his own subordinates at a monthly cost of Rupees 85. He also describes the field demarcation performed by the

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Survey Amins to consist of a wooden picket surrounded by a heap of earth at the corner of each field. This was found to last for about a year, unless intentionally removed, sufficiently long in fact to admit of test and correction. He points out that at the desire of the Collector of South Arcot, every field had been measured and plotted down to 0·06 acre, and that if this minute survey was considered necessary, a larger scale for maps would be requisite, that of 3 Chains=1 inch being recommended. The Great Trigonometrical Survey Records were received too late in the year to be made use of in connecting work in South Arcot with the Great Trigonometrical Survey Stations.

14. In the meanwhile, the want of an accurate measurement of lands being universally felt and its necessity unanimously admitted, a scheme for the General Survey of the Presidency was sanctioned by the Court of Directors after considerable correspondence between the Board of Revenue, the Government of Madras, the Government of India and the Court.

15. Scheme for General Survey of the Presidency sanctioned—*Selection from the Records of the Madras Government, No. LIII.*—The scheme embraced the production of Field, Village and Taluq maps to secure the permanency of the sanctioned survey. The area of the Presidency was estimated at 120,000 square miles requiring to be surveyed for area, but only one half or 60,000 would, it was thought, come under the minute or field survey at a cost of Rupees 64 per square mile and would occupy twenty-two years in execution.

16. The Madras Government, in giving detailed instructions, express their opinion "that the survey should decidedly be a perfect one" and "that every particular of Topographical or revenue importance should be exhibited and no expense will be vain to secure perfection in these two respects." They also approved of the scales to be used for Village, Taluq and District maps.

17. Scheme for general classification and settlement sanctioned.—At the same time, a sum of Rupees 38,40,000 was sanctioned for the Classification and Settlement of the Presidency at an average rate of Rupees 64 per square mile.

18. In June 1857, Captain Priestley was appointed to superintend the proposed survey and directed to submit a plan of operations and list of establishment. Mr. Newill of the Civil Service was gazetted Director Revenue Settlement.

19. In the year 1858, revised estimates were prepared and sent in. In these estimates, it was calculated that the Survey and Settlement of the whole Presidency would be completed in fourteen years at a total cost of Rs. 76,40,000 or Rs. 118 per square mile. The decreased rate was to be attained by

	Rs.	A.	P.
1 Deputy Superintendent .. 500 Travelling Allowance. 75 Contingent charges ... 100	675	0	0
1 European Assistant ... 325 Travelling Allowance ... 75	400	0	0
1 European Assistant . ... 225 Travelling Allowance ... 75	300	0	0
4 Head Surveyors from Rs. 70 to 100	340	0	0
8 Deputy Surveyors from Rs. 30 to 50.	290	0	0
4 Detail Surveyors from Rupees 20 to 25.	85	0	0

See letter from H. Forbes, Esq., Actg. Secretary to Government, to Government of India, dated 25th January 1858, No. 97, para. 13 page 333, Vol. LIII., Selections of Government Records.

	Rs.	A.	P.
For Settlement per sqr. M.	51	0	0
,, Demarcation do.	10	0	0
,, Survey do.	55	0	0
,, Lithographic Dept. do.	2	0	0

	Rs.	A.	P.
40 Survey Amins from Rs. 10 to 14	440	0	0
40 Goomastahs from Rs. 7 to 9	310	0	0
1 Office Manager	75	0	0
1 Head Writer and Computer.	35	0	0
9 Writers and Computers from Rs. 15 to 25...	190	0	0
1 Head Draughtsman	50	0	0
15 Draughtsmen from Rs. 15 to 35	325	0	0
3 Duffadars or Head Peons from Rupees 7½ to 8	23	0	0
27 Peons from Rs. 4 to 6	125	0	0
55 Measuring Peons from Rs. 4 to 5	247	0	0
26 Station markers from Rs. 4½ to 7	121	0	0
4 Muchies from Rs. 4½ to 5½ ...	19	0	0
1 Blacksmith	5	0	0
1 Chuckler or worker in leather.	5	0	0
Measurement allowance... ...	630	0	0
Total...	4,690	0	0

increasing the number of men in the lower grades, leaving the officers at the same strength as in the original estimate.

20. The Settlement Department was entrusted with the duty of demarcation. Demarcation parties were formed and commenced work under the orders of Messrs. Banbury and Master in South Arcot, Trichinopoly, and Rajahmundry.

21. In 1858, Lieutenant Hessey was appointed Deputy Superintendent Revenue Survey, of the first party, and Captain Crewe, First Assistant Superintendent was sent to Rajahmundry where he received charge of the second party which had been then set on foot by the Superintendent. A third survey party was organized in Masulipatam by the Superintendent and in 1859, was handed over to Captain Pratt, 84th Foot, promoted to be Deputy Superintendent.

22. A Revenue Survey of the Wynaad being considered absolutely necessary by the local Government, they directed that immediate measures should be taken for commencing the Survey of that taluq. A fourth party was commenced before the end of 1859 under Captain Hessey temporarily detached for the purpose.

23. History of No. 1 Party.—After the general survey was sanctioned, No. 1 Party, under Lieutenant Hessey, not only completed what remained in the party surveyed taluqs of the South Arcot District but also executed by the close of 1859, a survey of 650 square miles, or in all 1891 square miles, as per margin, completed since the commencement of the survey.

Scale.	Rs.	A.	P.
1 Deputy Supt ... ... 500 Travelling Allowance ... 75	575	0	0
1 European Assistant ... 350 Travelling Allowance ... 75	425	0	0
1 European Assistant ... 250 Travelling Allowance ... 75	325	0	0
1 Sub-Assistant... ...	150	0	0
8 Head Surveyors from Rs. 50 to 100	580	0	0
12 Deputy Surveyors from Rs.30 to 50.	450	0	0
6 Detail Surveyors from Rs. 20 to 25.	135	0	0
60 Amins from Rs. 12 to 14 Rs.	750	0	0
60 Gumastahs from Rs. 8 to 10	510	0	0
1 Office Manager	100	0	0
1 Head Writer and Computer.	50	0	0
11 Writers and Computers from Rupees 15 to 30	268	0	0
1 Head Draughtsman	75	0	0
19 Draughtsmen from Rs. 15 to 50	485	0	0

South Arcot ...	514
Trichinopoly ...	1377

24. In 1859, work was provided by the Settlement Department in the Namakal Taluq although the survey of the Trichinopoly District was still incomplete. The survey of a fifth district (Salem) was thus undertaken, an arrangement which required the Deputy Superintendent in the south to supervise men employed in two districts.

		RS.	A.	P.
2	Duffadars or Head Peons at 10 Rupees	20	0	0
13	Peons from Rs. 7 to 8. ...	93	0	0
140	Peons, measurers included at Rupees 6 each	840	0	0
4	Muchis from Rs. 5 to 8 ...	25	0	0
1	Blacksmith	5	0	0
1	Chuckler or worker in leather.	5	0	0
	Measurement allowance ...	768	13	4
	Total ..	6,664	13	4

25. The survey of 2939 square miles of the Trichinopoly District may be said to have been completed before the close of 1861. In subsequent years however, the measurement of additional cultivation was undertaken by the survey.

26. The survey of the Salem, as well as of the Coimbatore District (the latter taken in hand to provide work for Surveyors returned from Wynaad there being no demarcation ready elsewhere) was delayed by defective demarcation. The extent of country surveyed by Lieutenant-Colonel Hessey's party in the plains up to 31st December 1872 is as follows:—

South Arcot...	...	514 Square miles.
Trichinopoly...	...	2939 do.
Salem ...	...	4531 do.
Coimbatore ...	...	3645 do.

27. History of No. 2 Party—Scale same as that of No. 1 Party.—The party in Rajahmundry commenced its operations in September 1858, and completed before March 1863, the survey of the Ryotwari villages in nine taluqs, composing the present Godavery District, representing an area of 3392 square miles. Certain portions of the district were excluded from demarcation by the Settlement Department, and consequently not undertaken by the survey; the field of operations being determined altogether by the Director Revenue Settlement with regard to its advantage in a Revenue point of view. All that could be effected under these conditions therefore in the excluded tracts was the survey of main roads and adjacent chief topographical details.

28. In G. O., No. 1594 of 23rd November 1859, the Director Revenue Settlement was desired in communication with the Superintendent Revenue Survey, to report upon the additional means proper to be adopted for expediting the survey of the Godavery and Kistna Districts. Arrangements were accordingly proposed and sanctioned, by which the strength of the Northern parties was raised. An auxiliary party of half the strength of a full party at a cost of (Rupees 43,923 per annum) was organized in the Godavery District. The proposal by the Director Revenue Settlement, to relax the rigid standard of accuracy enforced in village maps was approved of by Government though earnestly deprecated by the Superintendent. In practice, however, the maximum error has not exceeded 1·48, and the average error, is 0·48 per cent.

29. In 1859, a detachment from No. 2 Party was drafted to Kurnool to commence operations there under Lieutenant Pavy 74th Highlanders. The remainder of the party followed, as work was completed in Rajahmundry.

30. The survey areas and maps of villages coming under the influence of the Irrigation and Canal Company's operations being those first required, surveyors were necessarily much scattered along the line of canal. To this and to the boundaries of taluqs being left undemarcated, is attributable the non-completion of the survey of many of the taluqs up to the present date. Surveyors were also required in Kurnool to sub-divide fields for the convenience of irrigation accounts and to measure putta holdings. The extent surveyed by the party since its organization up to 31st December 1872 is, as will be seen from the margin, 9159 square miles.

Godavery ...	...	3392 Square miles.	
Kurnool ...	...	5767	Do.

31. History of No. 3 Party—Scale, same as that of No. 1 Party.—The nucleus of a third party was handed over by the Superintendent to Captain Pratt in April 1859. Augmented by drafts of men from the senior parties, it commenced survey operations in the late Masulipatam (now Kistna) District, but the party was not raised to its full strength till the September following.

32. The survey of 6378 square miles of country in the eleven taluqs composing the district was completed by the close of 1864. The delineation in village maps of topographical details in some of the taluqs first entered on was found very meagre, and was therefore supplemented by a plane table survey on a scale of 2 inches = 1 mile for the construction of taluq maps. Similar neglect has not since then occurred.

33. By the cyclone of the 1st November 1864, maps of 171 villages completed and in different stages of preparation, also Survey and Demarcation records, were either destroyed or materially injured at Guntoor. The retention of the Head Quarters of the party in the Masulipatam District for some time was therefore found necessary. The measurement of 60 square miles of additional cultivation in fields was performed simultaneously with the restoration of the destroyed records.

34. In 1865, a detachment from the party (No. 3) commenced work in the Cuddapah District under Mr. J. Tomlinson, who remained in charge till relieved by Colonel Crewe in April. The total extent surveyed by the party up to December 1872 is 9262 square miles.

Kistna ...	...	6378 Square miles.	
Cuddapah...	...	2884	Do.

35. History of No. 4 Party Present—Scale, same as that of No. 1 Party.—The fourth party was organized by drafts of men from No. 1 Party. The work on which it was engaged at first was of a special nature, because Wynaad (where the working season is limited to five months in the year) presents many formidable obstacles. Great difficulty was experienced in inducing men to take service in Wynaad, and much time was lost in moving the party there and back, till its final transfer to the Tinnevelly District, agreeably to G. O., No. 895 of 25th April 1862. Tenkasy Taluq was first handed over for survey by the Settlement Department, and survey operations were extended gradually to the other taluqs. Extremely defective demarcation and other circumstances delayed the progress of the survey which, however, has now completed the district with the exception of a hilly tract to the N. West, a long standing dispute concerning the boundary between Tinnevelly and Travancore territory having hitherto prevented its demarcation. Marginally is given the extent surveyed by the party up to the end of 1372, exclusive of what was performed in the Salem and Coimbatore Districts noted under another head.

Wynaad ...	...	191 Square miles.	
Tinnevelly...	...	4560	Do.
Madura ...	...	90	Do.

36. History of No. 5 Party.—*Scale same as that of No. 1 Party.*—The auxiliary Party, sanctioned for the Godavery District in G. O. of the 28th December 1859, and referred to in paragraph 28, was transferred to Nellore, and augmented by large drafts of men from Nos. 1 and 3 Parties. This formed a fifth Party, and commenced the revenue survey of the district in March 1861 under Mr. Puckle. The Nellore Taluq was not at first demarcated with stone, consequently a great many marks disappeared, and much difficulty was experienced in making corrections. The survey of waste lands and unsettled boundary disputes prolonged the completion of the field and boundary work to 1866. At the close of that year, a small Party of Surveyors was sent to the Madras (now Chingleput) District, in which the demarcation is performed by the Revenue Survey Department, under Orders of Government, dated 12th December 1864, No. 2,213.

37. On the transfer of the head quarters to the Chingleput District a detachment remained to finish arrears of work and to carry on the demarcation and survey of Zemindari tracts and of hill ranges excluded from demarcation. The line dividing Nellore from Kurnool and Kistna has been demarcated by the Survey, the Settlement Department having declined to undertake the duty. The long delay in settling and defining the boundary line between this district and Cuddapah has hitherto stood in the way of the completion of the District Map of Nellore.

38. The non-settlement of the boundary between the Trivellore Taluq and the adjoining Zemindari tracts retarded the progress of survey in the Chingleput District; but, the demarcation being good, the survey of five out of six taluqs taken in hand has been completed, and area lists for all the villages in four taluqs have been lodged in the Central Survey Office for settlement purposes. The extent of country surveyed is given in the margin.

Nellore	...	2,462 square miles.
Chingleput	...	2,834 do.
North Arcot	...	110 do.

39. History of No. 6 Party.—At the desire of the Court of Wards, who were anxious that an accurate Revenue record should be made of the Purla Kimedy Estate (in Ganjam, which was, and is still, under wardship), the Superintendent in 1863 organized a small Party for the survey of the Zemindari, which he placed under Lieutenant Wynch. It was at first intended that the Manager of the estate should perform the necessary demarcation, but after a short time it was found necessary to have an establishment trained by the Survey during one year. The charge of it then reverted to the Revenue Officers. The survey of the estate, comprising 544 square miles, came to a close during the Superintendent's absence on sick leave in 1866, and the establishment served to form the nucleus of the 6th and last Survey Party organized in Ganjam in September 1866, of half the usual strength, in compliance with G. O., No. 2,054, of 31st August 1865. Up to date it has surveyed 824 square miles and completed the Chicacole Taluq.

Scale of Establishment for Purla Kimedy.

		Rs.	A.	P.
1	Assistant Superintendent ...	450	0	0
1	Sub-Assistant...	150	0	0
13	Surveyors	650	0	0
20	Amins, etc.	230	0	0
88	Measuring Peons, etc... ...	452	0	0
13	Computers and Draughtsmen	400	0	0
	Total...	2,332	0	0

Scale of No. 6 Party.

		Rs.	A.	P.
1	Military Assistant	681	10	0
1	Sub-Assistant...	150	0	0
5	Head Surveyors, from Rs. 50 to 100	380	0	0
10	Deputy Surveyors, from Rs. 25 to 50	340	0	0
10	Detail Surveyors, from Rs. 17½ to 25	200	0	0
30	Amins, from Rs. 10 to 14 ...	360	0	0
30	Gumastahs, from Rs. 8 to 10	270	0	0
1	Manager	75	0	0
7	Writers and Computers ...	165	0	0
11	Draughtsmen	270	0	0
1	Duffadar	10	0	0
55	Measuring Peons, &c. ...	340	0	0
	Measurement allowance	334	6	8
	Measurers	288	8	8
	Coolies	187	8	0
	Contingencies	100	0	0
	Total...	4,202	1	4

40. Madras Town Survey.—A detailed survey of all land held within the limits of the district of the town of Madras on a large scale, with divisional and key-maps on reduced scales, was ordered by Government in March 1854. The establishment originally sanctioned was increased to double its strength in 1856. The work was at first under the control of the Collector of the district, and was intended to be professionally examined from time to time by the Executive Engineer Officer at the Presidency.

Scale of Establishment.

			Rs.
2	Revenue Surveyors ...	@ 175 each	350
2	Assistant do. ...	@ 50 „	100
2	Writers	@ 20 „	40
2	Tindals	@ 7 „	14
4	Chainmen	@ 5½ „	22
2	Instrument-bearers ...	@ 5½ „	11
2	Offset men	@ 5 „	10
4	Flagmen	@ 5 „	20
2	Lascars...	@ 6 „	12
		Total ..	579

41. Test Survey.—In 1859, on the Superintendent's return to Madras after having organized the Northern Survey Parties, the Madras Town Survey was handed over to him, and, at his request, a small establishment was given him for the purpose of testing the work up to that time performed, the Engineer Officer having found it impossible to spare time from his other duties to examine it while in progress.

			Rs.
1	Head Surveyor...	...	59
2	Computers	...	35
1	Draughtsman	...	30
6	Measurers	...	37
		Total...	152

42. Up to the date of this transfer, 16½ square miles, containing 13,277 holdings (about 800 to the square mile), had been completed in the divisions marginally noted at a cost of Rupees 35,629, or Rupees 2,160 per square mile, or Rupees 2-10-11 per holding.

Mylapore.
Nungumbaukum.
Triplicane.
Egmore.

43. The result of the examination of former work by the Superintendent was satisfactory; few errors were discovered, and of these not many exceeding 5 per cent.

44. The town survey was finally closed in 1863, an additional area of ten square miles, containing 14,976 holdings (about 1,500 to the square mile), having been measured and mapped for Rupees 21,255, or 2,125 per square mile, or Rupees 1-6-8 per holding, in the divisions named in the margin.

Black Town (2 Divisions).
Perambore.
Tondiarpet.

Coonoor, and Kotagherry), and also of outlying estates, waste land blocks, Government reserves, &c. Till then Surveyors had been merely detached as required for the survey of waste land blocks on the Hills. No officer being at first available, Mr. Starr, the Senior Central Office Assistant, directed the work of demarcation and survey till relieved by Lieutenant Freeth, R.A., of the Coorg Survey during the S. W. monsoon, when work was impracticable on the West Coast. After his departure Mr. Starr was again put in charge. On the return of the Superintendent from leave at the end of 1866 he placed the control of the detachment of No. 1 Party, employed on the Hills and in Wynaad, in the hands of Major Hessey, the Deputy Superintendent of the Party. It has been successively in executive charge of Sub-Assistant Mr. Fraser, Lieutenant Clerk (Coorg Survey) for a few months, and Captain Sargeaunt for four years in all.

49. Nellumboor.—Early in 1870, a Surveyor from the Wynaad and Nilgiri detachment was despatched to the Nellumboor Valley in Malabar to commence the survey of the teak plantations and Government forests. The demarcation was at first undertaken by the Forest Superintendent. It was, after a short time, considered expedient that the Survey Department should also perform this duty.

50. During each subsequent working season from one to four Surveyors have been thus employed. The extreme unhealthiness and remoteness of the locality, the want of labour which had to be imported, and the short working season, tended to render this survey both tedious and expensive. However, as ascertained from personal inspection by the Superintendent, it has been thoroughly and satisfactorily performed.

51. Shervaroy Hills.—The survey of the Salem District did not at first embrace that of the Shervaroy Hills; but in 1861, when work was stopped by the S. W. monsoon in Wynaad, some of the Surveyors engaged there were transferred under an Assistant Superintendent to these Hills for employment till the season permitted of work being resumed in Wynaad. The climate being unsuited to natives of the plains, the demarcation defective, and the Survey Assistant having neglected his instructions, but slow progress was at first made. During each successive hot season, for three years, a detachment from the Salem Party was thus employed. Besides maps of coffee estates and of the area under cultivation by the Mallialies (Hill men), a general map, of the whole plateau was provided.

52. The assessment was revised in 1864 by the Collector of the district, the Hon. D. Arbuthnott, and satisfactorily settled on the survey data.

53. Ponaghy Hills.—The demarcation and survey of nineteen properties on the Annamallay Hills, of which eight are coffee plantations, were performed, in 1869, on the requisition of the Collector of the Coimbatore District.

54. Demarcation.—Previous to the sanction of the revised estimates in 1858 there had been no special demarcation at all. The value of the work that had been done was much lessened by the difficulty in recovering the limits of such fields as had no natural boundaries. Under the new scheme, not only were the boundaries of villages to be demarcated, but also every field having a number in the Survey

45. The great difference between the average content of holdings surveyed under the Collector and those by the establishment under the Superintendent arises from the latter having been employed in Black Town, where the land is chiefly covered by native houses and backyards averaging 0·08 acre in extent.

46. The maps were lithographed after survey for revenue, municipal, engineering, and other Government purposes. A combined map on a reduced scale, showing the municipal divisions, has been compiled and lithographed in the Survey Office to aid the Census Commissioners and the Engineers engaged on the Madras Water Works. To some extent, a demand exists for divisional and key-maps, and for extracts showing particular holdings.

47. Special Survey, Wynaad.—In paragraph 22, the circumstances connected with the undertaking of the survey of the Wynaad Taluq have been mentioned. Both the survey and demarcation operations were carried on during the working seasons of 1860,* 61, and 62,† and a small detachment was sent early in 1863 to complete unfinished surveys. Meanwhile, from a consideration of the expense, Government resolved to reduce the establishment, merely to carry out the survey of Government land and private estates (the latter on payment), and to ascertain from time to time the taxable cultivated area. For this purpose, an establishment, at a monthly cost of about Rupees 1,000, was placed under the Collector of Malabar. This system, with some modification, was continued till the end of 1866, when, being found unsatisfactory, the survey was again handed over to the Superintendent, and arrangements were made for employing the Surveyors, who were at the time under Captain Sargeaunt on the Nilgiris, when work could not be carried on in Wynaad. The demarcation performed by the Revenue Department being found defective, the performance of the duty was also handed over to the Survey Department, and an efficient establishment for both demarcation and survey was sanctioned in G. O., No. 1,225, 10th August 1870, and has since then continued to work under Captain Sargeaunt on the Nilgiris, in Wynaad and in Nellumboor (a part of the Malabar District), according to the season.

* Under Captain Searle.
† Do. do. Barker.

Demarcation.

		Rs.
2 Head Gumastahs ...	@ Rs. 60 each	120
20 Demarcation Gumastahs	@ 30 „	600
2 Office Gumastahs ...	@ Rs. 30 „	60
25 Peons	@ Rs. 7 each	175
Batta	... ...	284
Stone allowance	... ...	100
For one month...		1,339
For five months...		6,695

Survey.

		Rs.
1 Assistant Superintendent		750
Batta, Rupees 5 per diem	...	150
2 Sub-Assistants, Rs. 250 and 200		450
10 Surveyors, Rupees 130 each	...	1,300
103 Peons and Measurers	... ...	760
3 Writers and Gumastahs	... ...	160
Batta	... ...	735
Station allowance	... ...	100
For one month ..		4,305
For five months ..		21,525
Cost of Demarcation...		6,695
Total ..		28,220
Contingencies ..		1,500
Grand Total ..		34,020

48. Nilgiris.—In 1866 Government directed that a systematic detailed survey on a large scale should be made of the three settlements (Ootacamund, Coonoor, and Kotagherry), and also of outlying estates, waste land blocks, Government reserves, &c. Till then Surveyors had been merely detached as required for the survey of waste land blocks on the Hills. No officer being at first available, Mr. Starr, the Senior Central Office Assistant, directed the work of demarcation and survey till relieved by Lieutenant Freeth, R.A., of the Coorg Survey during the S. W. monsoon, when work was impracticable on the West Coast. After his departure Mr. Starr was again put in charge. On the return of the Superintendent from leave at the end of 1866 he placed the control of the detachment of No. 1 Party, employed on the Hills and in Wynaad, in the hands of Major Hessey, the Deputy Superintendent of the Party. It has been successively in executive charge of Sub-Assistant Mr. Fraser, Lieutenant Clerk (Coorg Survey) for a few months, and Captain Sargeaunt for four years in all.

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50. During each subsequent working season from one to four Surveyors have been thus employed. The extreme unhealthiness and remoteness of the locality, the want of labour which had to be imported, and the short working season, tended to render this survey both tedious and expensive. However, as ascertained from personal inspection by the Superintendent, it has been thoroughly and satisfactorily performed.

51. Shervaroy Hills.—The survey of the Salem District did not at first embrace that of the Shervaroy Hills; but in 1861, when work was stopped by the S. W. monsoon in Wynaad, some of the Surveyors engaged there were transferred under an Assistant Superintendent to these Hills for employment till the season permitted of work being resumed in Wynaad. The climate being unsuited to natives of the plains, the demarcation defective, and the Survey Assistant having neglected his instructions, but slow progress was at first made. During each successive hot season, for three years, a detachment from the Salem Party was thus employed. Besides maps of coffee estates and of the area under cultivation by the Mallialies (Hill men), a general map, of the whole plateau was provided.

52. The assessment was revised in 1864 by the Collector of the district, the Hon. D. Arbuthnott, and satisfactorily settled on the survey data.

53. Ponachy Hills.—The demarcation and survey of nineteen properties on the Annamallay Hills, of which eight are coffee plantations, were performed, in 1869, on the requisition of the Collector of the Coimbatore District.

54. Demarcation.—Previous to the sanction of the revised estimates in 1858 there had been no special demarcation at all. The value of the work that had been done was much lessened by the difficulty in recovering the limits of such fields as had no natural boundaries. Under the new scheme, not only were the boundaries of villages to be demarcated, but also every field having a number in the Survey

accounts was to be marked out so as to be easily recognizable at any future period. As mentioned in paragraph 20, this duty was undertaken by the Settlement Department (1858).

55. In the South Arcot District and in Trichinopoly there was a considerable extent of country already surveyed which required to be demarcated and settled. The department had also to demarcate in advance of the Survey. The Torriore Taluq (now Moosery) was taken up for the purpose, whilst the Survey continued at work on the old system in the Velkondapuram (now Perambalore) Taluq.

56. Subsequently, the Salem, Kistna, Nellore, Kurnool, Cuddapah, Coimbatore, and Tinnevelly Districts, and the Wynaad Taluq, Malabar District, were taken up for demarcation by the Settlement Department. Of the above, some have been completed, others are in progress, and others again have been abandoned by the Settlement Department.

57. The demarcation was, from the first, found unsuited to survey requirements, but it was not till 1860 that the Superintendent advocated its being handed over to the Survey. This proposal was opposed by the Director, Revenue Settlement, but circumstances at last induced the Government to consent to the change.

58. In the year 1864 it was resolved by Government that the work of demarcation should be performed by the Survey. In 1866 demarcation was commenced by the Survey on fixed principles in the Madras District (now Chingleput), in Ganjam, and, a year after, in Coimbatore.

G. O., 12th December 1861, No. 2,243, paragraph 26. The Government resolve, therefore, that in all districts hereafter taken up the demarcation shall be performed by the Survey Department.

59. History of No. 1, Chingleput Demarcation Party.—The first Demarcation Party under the Survey Department was set on foot in 1866, men having been transferred from the Settlement Department for the purpose and placed under the orders of Lieutenant Cloete, 1st Assistant Superintendent, Revenue Survey. Work was commenced in the Sydapet Taluq, an unfortunate choice of locality as it turned out, the land being chiefly owned by wealthy and litigious non-resident landlords and the occupants a needy class frequently paying excessive rents. Material for demarcation marks was not easily procurable, the quarries being inconveniently situated and stone-cutters few in number and exorbitant in their demands. A revision of the demarcation rules was made, and men entertained and specially trained for performing demarcation according to fixed rules.

Scale.	Rs.	A.	P.
1 Military Asst. Supt. ... 350 Travelling allowance.... 75	425	0	0
1 Uncov. 2nd Asst. Supt. 250 Travelling allowance.... 75	325	0	0
Regimental allowance of a Lieutenant on Staff Corps.	256	10	0
2 Inspectors	250	0	0
2 Dy. do.	90	0	0
4 Office Gumts. from Rs. 12 to 15	54	0	0
17 Head Gumts. from Rs. 20 to 30	400	0	0
52 Gumastahs, from Rs. 12 to 15	714	0	0
1 Duffadar or Head Peon... ...	16	0	0
100 Peons, from Rs. 6 to 8... ...	612	0	0
3 Moochies, from Rs. 7 to 9 ...	25	0	0
1 Sweeper...	5	0	0
Contingencies	100	0	0
Boundary-pillars	833	5	4
1 Dresser	24	8	0
Office accommodation (on average)	60	13	4
Total...	4,183	4	8

60. As was anticipated, progress was for some time slow and the cost high. The work, however, was good, permanent, and suited to both survey and settlement requirements.

61. The Party has successively taken up the Sydapet, Trivellore, Ponairy, Conjeveram, Chingleput, and Madurantakum Taluqs, which compose the Chingleput District, and is now working, as part of No. 5 Survey Party, in the Arcot and Wallajah Taluqs of North Arcot District.

62. The combined system of demarcation and survey was adopted in the Chingleput Taluq, and has been continued with satisfactory results in those subsequently entered on.

63. Demarcation was retarded by the causes affecting the progress of survey, noted in paragraph 38. The non-attendance and the delay in erecting field-marks by villagers were for some time found serious obstacles, and it was deemed expedient to demarcate under the provisions of Section 7 of Act XXVIII. of 1860, Government providing and erecting marks in the first instance and recovering the cost from the owner or occupant. This necessarily expensive system has, however, been entirely got rid of—thanks to the good-will and co-operation of the ryots, who, at present, not only provide field-stones, but also on payment those required by Government.

64. The total area demarcated by this Party is 4,733 square miles.

65. History of No. 2, Ganjam Demarcation Party.—No. 2 Demarcation Party was organized under Mr. Cardozo, 1st Assistant Superintendent, in August 1866, the four previous months having been occupied in training men and collecting materials. Like No. 6 Survey establishment, to which it was attached, its strength was only half that of a full Demarcation Party. Chicacole Taluq, Ganjam District, was the locality selected by the advice of the Collector as that in which work should commence.

Scale.	Rs.	A.	P.
1 2nd Assistant Superintendent...	325	0	0
1 Inspector	100	0	0
1 Deputy Inspector	40	0	0
2 Office Gumastahs, from Rs. 12 to 15	27	0	0
5 Head Gumastahs, from Rs 20 to 25...	110	0	0
25 Demarcation Gumastahs, from Rupees 12 to 15	336	0	0
33 Peons, from Rupees 6 to 7 ...	199	0	0
Contingencies...	50	0	0
Average cost of erecting boundary pillars	416	13	4
Office accommodation (on average).	60	10	8
Total...	1,664	8	0

66. In this taluq a contractor was employed to provide stones of the approved patterns and duly marked. From him the ryots purchased field-stones at a fixed very low rate.

67. On moving to the Berhampore Taluq, at the recommendation of the officer in charge, recourse was had to Section 7 in order to accelerate progress. It was, however, found practicable to revert to the original arrangement for supplying field-stones in the villages of the Berhampore Taluq last taken up and in those composing the Goomsoor Taluq, at the same time introducing the combined system by which No. 2 Demarcation Party works conjointly with No. 6 Survey.

68. The ryots in Ganjam evinced so decided a desire to have each individual holding separately demarcated and surveyed that it was considered advisable, for the

purpose of gaining their co-operation, to carry out their wishes. Demarcation marks were obtainable at such low rates that it was hoped no material increase of cost would result in the only three taluqs belonging to Government.

69. It has, however, been found that the minute sub-divisions of land cannot be thus dealt with except at a greatly increased expenditure of time and money. Orders have, therefore, been issued to combine several holdings into one survey-field where land is not exceptionally valuable.

70. The Party has in all demarcated 843 square miles.

71. History of No. 3 Coimbatore Demarcation Party.—*Scale same as that of No. 1, Demarcation Party.*—This Party was started in 1867 in charge of Captain Baynes, 91st Foot, 1st Assistant Superintendent, in order to complete the Darapuram Taluq, Coimbatore District, of which one-half had been demarcated by the Settlement Department.

72. It has since then taken up the Caroor, Polachy, and Oodimallycottah Taluqs of the same district and the mootahs in that of Salem. It has also renewed the demarcation of the Coimbatore and Pulladum Taluqs of Coimbatore, besides demarcating some villages of the latter taluq originally excluded by the Settlement Department.

Demarcated in all 3,672 square miles.

73. The taluqs of Polachy and Oodimallycottah have been successfully undertaken on the system of combined demarcation and survey by which the Demarcation establishment is merged into No. 1 Survey.

74. The Party has proved useful in furnishing drafts of trained men to other districts.

75. From the first field-stones have been supplied by a contractor to ryots on payment at a fixed rate.

76. Land in this district being held in larger blocks than in most others, it has been found possible to deal with each individual holding without unduly swelling expenditure. The ryots have invariably evinced good will and have cheerfully afforded assistance.

77. History of No. 4 Madura Demarcation Party.—Into Madura demarcation and survey have been introduced together, both processes proceeding *pari passu*.

78. Preliminary inquiries and arrangements for the supply of demarcation material having been made the previous year, a small combined Party under Captain Thompson, R.A., Assistant Superintendent, composed of detachments from Tinnevelly and Coimbatore, was, by desire of the Board of Revenue, despatched in 1871 to the Cumbum Valley to commence work in the Periakolam Taluq. The locality being favorable, the working season only commences in July and lasts till the advent of the N.E. monsoon, at the beginning of November. The work thus initiated has been extended to the rest of the taluq where the season for work is not so limited.

79. The revenue survey of the Tinnevelly District having, as stated in paragraph 33, been brought to a close, the establishment of No. 4 Party under the Deputy Superintendent, Captain Coote, is being transferred to the Madura District.

80. At first it was found necessary for Government to furnish stones by [illegible] and charging [illegible]; but Captain Coote now reports that the villagers at present undertake to supply their own field marks and also those required by Government on payment, as is done in Chingleput and North Arcot.

81. In compliance with the orders of the Court of Wards, orders have been issued to commence the detailed demarcation and survey of the Bodinaiknur Zemindari which forms part of the Periakolam Taluq.

82. History of No. 5 Bellary Demarcation Party.—In Bellary, with the concurrence of the Collector, it was decided to take up the Adoni Taluq for demarcation and survey as men could be transferred from No. 2 Survey Party on the completion of the Revenue Survey of the Kurnool District.

83. Mr. Merriman, Assistant Superintendent, was transferred to Coimbatore for three months, for instruction in demarcation, and has been placed in charge of both demarcation and survey on the combined system in Adoni.

84. Endeavours to introduce the system found so advantageous in the Chingleput and North Arcot Districts for the supply of all Demarcation stones through the ryots, have been successful.

85. Lithographic Establishment.—In February 1858, sanction was accorded by the Government of India for the formation of a Lithographic Establishment at a monthly cost of Rupees 751. A commencement was made in that year; but the operations were confined to mere preliminaries, as the Superintendent, being engaged in organising the two Northern parties, was frequently on the move and carried with him his office and the eight or ten men who composed the Lithographic Establishment. He was thus unable, till the beginning of 1860, to establish his Central Office at Madras with which the Lithographic Establishment was to be connected in order that the responsibility for the correctness of the work might be borne by the Revenue Survey Department from beginning to end. Previous to the organization of the Lithographic Department under his orders, maps of sixteen villages were lithographed by the Lithographic Establishment belonging to the Department of Public Works.

Scale of Lithographic Establishment.

	Rs.	A.	P.
1 Head Draughtsman	90	0	0
12 Draughtsmen	375	0	0
8 Tracers	85	0	0
1 Lithographic Writer	20	0	0
4 Printers	60	0	0
14 Pressmen, Inkmen, etc.	80	0	0
2 Mutchies	20	0	0
3 Peons	17	0	0
1 Sweeper	4	0	0
Total ...	751	0	0

86. On the 1st January of the following year, the establishment consisted of the persons noted in the margin and worked three presses. Much difficulty was experienced in obtaining the services of competent men.

Head Lithographer	1
Draughtsmen	10
Tracers	6
Writer	1
Printers	3
Pressmen, etc.	13
Mutchies	2
Peons	2

87. Village maps were at first printed in colours to show the different tenures and descriptions of land. In 1862, symbols were substituted for colours, and again in 1866 these symbols were altogether omitted and a ribbon of colour introduced—*Vide* paras. from 91 to 93.

88. Revised scale of Lithographic Establishment.—In 1867, a proposal by

the Superintendent Revenue Survey, to raise the establishment to double its original strength was sanctioned, in order that it might keep pace with the Survey Establishments in the field which had been nearly trebled since the date of the original sanction of the Lithographic Establishment.

		RS.	A.	P.
1	Head Draughtsman	150	0	0
8	Draughtsmen	290	0	0
5	Examiners	160	0	0
15	Tracers	200	0	0
8	Typers	60	0	0
2	Map Record-keepers	55	0	0
1	Store-keeper	40	0	0
1	Lithographic Writer	20	0	0
7	Printers	87	0	0
33	Pressmen, Inkmen, etc... ...	210	0	0
31	Mutchies	202	0	0
3	Peons...	21	0	0
1	Sweeper	5	0	0
	Total...	1,500	0	0

89. Up to December 1872, maps of 13,562 villages and estates have been printed, making in all a total of 4,56,137 copies. Twenty-eight taluq maps, 100 copies each, have also been lithographed besides those of Coonoor and Ootacamund Settlements and of the Wellington and Trichinopoly Cantonments. A very large amount of miscellaneous work has also been performed. The value of maps lithographed is, approximately estimated, Rupees 2,59,360 as shown below :—

		RS.	A.	P.
Village	Maps	1,85,800	0	0
Taluq	do.	12,000	0	0
District	do.	3,850	0	0
Estate	do.	31,470	0	0
Skeleton	do.	1,940	0	0
Town Survey	do.	6,200	0	0
Miscellaneous	do.	10,300	0	0
Forms	do.	7,800	0	0
	Total ...	2,59,360	0	0

90. The duties of the Central Office are chiefly those of check and control. The preparation of topographical maps is also performed by the draughtsmen on its Establishment. In 1867 it was augmented simultaneously with the increase to the Lithographic Establishment. When demarcation was handed over to the survey, a small Office Establishment was attached to the Central Office.

Scale.

		RS.	A.	P.
1	Head Assistant	250	0	0
	Accounts Audit and Correspondence.			
1	Office Assistant	150	0	0
2	Clerks...	50	0	0
1	Record-keeper	50	0	0
1	Cash-keeper and Accountant... ...	40	0	0
2	Examiners	70	0	0
1	Despatching Clerk	15	0	0
1	Mutchi	7	8	0
	Records and Computations.			
1	Manager	100	0	0
2	Computers	60	0	0
1	Examiner	30	0	0
1	Record Gumastah	12	0	0
	Drawing Department.			
7	Draughtsmen and Examiners	270	0	0
1	Map Record Gumastah...	12	0	0
1	Mutchi...	7	8	0
	Servants.			
1	Duffadar or Head Peon.	14	0	0
7	Peons	50	0	0
	Demarcation Department.			
2	Examiners	120	0	0
1	Translator	50	0	0
1	Clerk	30	0	0
1	Record-keeper	20	0	0
1	Mutchi	7	0	0
3	Peons	21	0	0
	Total...	1,436	0	0

Changes introduced from time to time in Measurement, Plotting, Computation, and Mode of Recording.

91. Method of Recording Topographical Details.—In the original village maps, the different tenures and descriptions of cultivated and fallow land were shown by appropriate colours and an exact counterpart of the manuscript maps was produced in colours by the Lithographic press. To effect this, a large number of lithographic stones were necessary and the process altogether was found tedious and costly. To remedy this difficulty, symbols were, at the beginning of 1862, substituted for colours to distinguish cultivation and tenure.

92. The information for this purpose was obtained from the village accounts and was found frequently to differ from the actual state of the ground, land termed irrigated being discovered to bear dry crops, the source of irrigation having been destroyed by time, neglect or floods, and *vice versa*, land under luxuriant wet crops being entered in the unirrigated column, the water from which it derived its irrigation being brought from some private source. In like manner, waste land had been brought under cultivation and cultivated land had been abandoned.

93. It was therefore determined in 1865 to omit the symbols, but in order to have data wherewith to construct topographical maps, the limit of every existing block of wet or dry cultivation was distinguished in the village map by a particular ribbon of colour.

94. Change in the Computation of Field Areas.—The Superintendent had always felt that the weak point in the Madras system of survey was the mode of computing field areas. The multiplication of the mean length by the mean breadth answered as long as only applied to taks (plots) of tolerably regular shape, and to these this method had always been restricted. The content of irregular taks (plots) was obtained geometrically from the map and that of offsets was computed in like manner.

95. In 1862, the computing scale was introduced as an experiment and used to ascertain the content of irregularly shaped taks (plots) and fields. It was found to give such accurate results and to diminish labour so materially that, in 1864, the Superintendent directed that it should be generally adopted in supersession of the Khusreh or rougher method of computation described above.

96. To guard against the introduction of error, each computation is twice made independently. Where a difference between these two computations of more than acres 0·05 acres in a field of less extent than 10 acres exists, it is again computed by a third person and the mean of the two nearest areas adopted. Above 10 acres, 0·1 acre is the limit of difference permitted.

97. Very soon after commencing the tentative survey in South Arcot during 1853, the Officer in charge discovered that some additional check was required in field measurement to ensure accuracy and to point out the locality in which faulty measurement of the sides of taks (plots) had been made. The Amins were therefore directed to measure the diagonal of each tak (plot) in addition to the four sides, and evasion of this order was severely punished. The inspecting Surveyors were desired specially to examine fields of which the diagonal was omitted, and except the existence of a physical impossibility, no excuse was accepted. Subsequently, to

meet the case of error in the measurement of a diagonal itself the experiment was made of instructing Amins to note the length of *both* diagonals, one of which was certain to be correctly entered.

98. Carrying out these instructions practically amounted to surveying by triangles, and in 1866 this process was formally ordered. It permitted the field Surveyor to lay out a field in triangles in the manner most convenient for measurement, irrespective of quadrilateral taks (plots) at first followed. This in no way affected the method of plotting, whilst it secured increased accuracy and facilitated the discovery of the exact position in which an error in measurement had been made.

99. Changes in Recording Measurements.—The field-book in use by the tentative Survey Establishment in South Arcot included all the necessary Revenue details of each field measured. On the Settlement Department being set on foot, it was considered part of their duty as demarcators to record information of this description which was accordingly omitted from the survey field-book. It was apparently deemed advisable to confine the Survey Establishment strictly to its own special work; for an offer made by the officer in charge to record observations of the temperature, atmosphere and rain-fall, if provided with the necessary appliances, was declined. Rain gauges were, however, afterwards supplied, but no trustworthy record has been kept. Again it was proposed to collect statistical information for each village, the Revenue authorities, however, were of opinion that other and more suitable means of collecting this information were available.

Original Heading.

Wet or Dry.	Soil.	Pattadar's name and Trees, Buildings, etc.	No. of Field and commencement of measurement.	Measurement of Sides and area of field.				Crop.	Remarks.
				Boundaries.					
				North.	South.	East.	West.		

1858.

No. of Field and commencement of measurement.	Sides.		Diagonal.	Boundaries.				Area.		Trees, Buildings, etc.	Wet or Dry.	Govt. or Inam.	Remarks.
	North and South.	East and West.		North.	South.	East.	West.	Acres.	Dec.				

1863.

No. of Field and commencement of measurement.	Sides.		Diagonal.	Area.		Remarks.
	North and South.	East and West.		Acres.	Dec.	

100. From the very beginning, the Amins had prepared an eye-sketch in which not only every field but every tak (plot) into which the field had been cut up for measurement was shown and also the measured length of the sides of each tak (plot.)

101. Early in 1863, the heading of the Amin's field-book was again modified, three columns containing information regarding tenure, cultivation and topographical items being omitted. The first two of the omitted columns were included in the Land Register compiled by the Demarcation Department. A list of topographical details noting the fields in which they were situated was kept by the detail Surveyors.

102. In September 1869, the Superintendent altogether did away with Amin's field-books. It was found that no amount of supervision and inspection nor any penalty, however severe, was sufficient to prevent the Amins from recording all their measurements in the field on the sketch alone and transcribing them on their return to their houses into the field-book which thus ceased to be an original record.

103. The Amin's sketches had hitherto been made on common country brown paper mounted on course cloth. It was now determined that these sketches should be carefully drawn on good paper, to be well mounted on cloth as soon as received from the field, and that these sketches should be the only record which Amins were required to prepare on the ground.

104. From these sketches, on the survey and measurement of the village being plotted, a record was compiled, one field to each page with every measurement duly inserted.

105. It was found after a year's trial that provision was required for recording certain information; the Superintendent, therefore, directed that, in addition to the eye-sketch, every Amin should be furnished with a note-book on each page of which columns were provided for entering deductions, missing stones, unmeasured numbers, topographical items, signature of village officials and Demarcation discrepancies, etc.

106. In the same year, the general eye-sketch was superseded by devoting one page of the note-book to a sketch of a block of numbers, the opposite page containing the detailed information for the fields shown in the sketch. At the recommendation of a committee of officers, held in the beginning of 1871, and on the introduction of the combined system of demarcation and survey, a large book was introduced on each page of which the measurements and shape of one or more numbers are entered and at the end of the book the detailed information formerly given in the note-book is recorded.

107. Topographical Details.—On the completion of the field plotting, Topographical details in village maps are drawn in the maps by the Detail Surveyors on the ground. With the map in his hand on which each field is delineated, a man with very moderate abilities and pay is quite competent to perform this duty. Waste tracts included within the village boundary are surveyed in the regular manner.

108. For inserting details within the village boundary, there is no question but that the present system is preferable to the plan of having special topographical surveys made on the 4-inch or any smaller scale. The question of accuracy must be settled by the scale at present in use being 16 inches to a mile and the fact that every field is visited. As abovementioned, the present system admits of the employment of men on small pay, while to Plane Table Surveyors high pay must be given to secure the services of trustworthy and efficient men. The check afforded by the boundary of each field being laid down beforehand, and being of necessity visited by the person employed in detailing, cannot possibly be surpassed; whereas in Plane Table Surveying, except inspection and going over a portion of the ground again, there are no means of testing the accuracy of the work.

109. It has not yet been satisfactorily determined whether accuracy and cheapness are on the side of Plane Table Surveying or of surveying with Chain and Compass for merely topographical purposes. For the 4-in. = 1 mile scale, perhaps the latter has the advantage; on any smaller scale, the Plane Table is on the whole to be preferred. In hilly countries, of course, the Plane Table must necessarily be used.

110. Minimum content of Fields recorded.—There can be no doubt that, if feasible, the measurement of every separate plot of ground held on putta should be

undertaken and its position shown in the village map. In many districts, however, this it has been found impossible in practice. The number and minute size of holdings render their measurement enormously expensive, and if generally carried out, would necessitate an increase to the scale on which village maps are drawn. In one block of 50 acres, for instance, the land was divided into 511 plots averaging rather less than 0·1 acre. At present, when a village sub-division is found to contain a large number of exceptionally small fields, it is plotted on the 32 inch scale and then reduced by Pentagraph into its proper place in the village map.

111. The limit of 4 acres in dry and 2 in wet land originally assigned to survey fields has always been preserved in wet land and till this year in dry. In order to expedite the operations of survey, permission has been lately granted to club fields in poor unirrigated land up to 12 acres under certain conditions. This will doubtless save time. Fields included within survey fields are, where they exist, measured by the Settlement Department after survey operations have been closed.

112. Interstitial Fields.—In all the districts first taken up for survey, the measurement of interstitial fields (*i. e.*, of fields contained within the survey fields of 2 acres in irrigated and 4 in unirrigated land) was performed by the Survey Department.

113. On receipt of orders from Government early in 1862, however, the measurement of these minor fields was discontinued.

114. In 1864, Government desired that the survey should record the length of the sides of minor fields coincident with those of survey fields and sketch in by eye the unmeasured sides.

115. The execution of this latter order was found to entail an expense altogether out of proportion to the results attained. The measurements and sketching of these minor fields not being verified by plotting, sufficient guarantee of their accuracy was not to be obtained to satisfy survey requirements. On the representation of the Superintendent, therefore, Government in 1872 decided to omit the partial measurement and sketching ordered in 1864.

116. The Department being relieved of the measurement of minor fields is a great boon. It will now take cognizance of survey fields alone. The measurement by the superior and costly agency of the professional survey, of fields varying from 1 acre to the minutest fraction of an acre swelled the cost of survey operations considerably, and, with the imposition of charges not originally contemplated and other circumstances beyond its control, has been the cause of the estimates having been so much exceeded.

117. Excess discovered by the Survey.—In reply to a call from the Board of Revenue in 1870, the Superintendent supplied what information he possessed on the subject of the credit due to the survey in bringing to account unassessed areas. At that time, it was shown that taking 2 Rupees per acre as the average assessment of land in the Madras Presidency, an annual increase from this cause had accrued to the assessed area, of the same amount as had up to that date been expended on survey operations.

118. The expenditure had been about Rupees 40,00,000, and the increase discovered by survey of the assessed area was 20,00,000 acres, or a little over 3,000 square miles, the mean percentage of increase being 14.

Present Operations.

119. Coimbatore and Salem.—No. 1 Party is at present engaged on the combined demarcation and survey of the Polachy Taluq and on the demarcation and survey of Mootahs in Salem excluded from operations by the Settlement Department. Colonel Hessey, Deputy Superintendent Revenue Survey is in charge of the party.

120. Kurnool and Bellary.—The Revenue Survey of the Kurnool District having come to a close, surveyors have been for some time past and are still employed on the District and Taluq boundary lines and on a topographical survey of tracts excluded from demarcation. The rest of the field establishment has entered on the Adoni Taluq of the Bellary District, the simultaneous demarcation and survey of which is to be performed on the combined system under the orders of Mr. H. O. C. Cardozo, Deputy Superintendent Revenue Survey.

121. Cuddapah.—No. 3 Party is still employed in the Cuddapah District under Mr. F. C. Puckle. The village boundary survey and field measurement in six out of eleven taluqs in the district have been brought to a close, but no taluq has been returned as complete, taluq boundaries being left undefined, patches of cultivation originally not demarcated being taken in hand, and changes requiring remeasurements being introduced by the Settlement Department.

122. Tinnevelly and Madura.—Work has been commenced on the combined system in the Madura District, and except some topographical surveyors employed in Zemindaries in Tinnevelly, the demarcation of which was undertaken by the survey, the field establishment has been transferred to the Periakolum Taluq of Madura, under the orders of Captain J. G. Cloete, Deputy Superintendent Revenue Survey.

123. Nellore, Chingleput, and North Arcot.—The Revenue survey of the Chingleput District being on the eve of completion, the Arcot Taluq of the adjoining district, North Arcot, was undertaken on the combined system of demarcation and survey early in 1872, under the orders of Mr. W. Beaumont, Deputy Superintendent Revenue Survey.

124. Ganjam.—The Survey of the Berhampore Taluq is nearly closed, and simultaneous demarcation and survey in Goomsoor has commenced under Captain C. D. Baynes, 1st Assistant Superintendent Revenue Survey.

Enclosure No. 2.—Four copies of a list showing Statements to accompany the above report.

Enclosure No. 3.—Copy of letter from Secretary to Government of India, to Government of Madras, dated 13th May 1872, No. 301.

From the same Officer, dated 20th June 1873, No. 1,391-64.

In continuation of my letter, date and number as per margin, I have the honour to enclose a copy of a letter* to the Secretary to Government, in reply to the letter from the Secretary to the Government of India, dated 13th May 1872, No. 301. This ought to have accompanied my letter of the 4th instant.

4th June 1873, No. 1,316-53.

* No. 1,531-45 of 28th July 1872, with enclosures.

2. I take this opportunity of submitting, for the information of the Board of Revenue, a spare copy of G. O., No. 495 of 17th May 1873, and Extract from my letter, No. 1,333-40 of 12th instant, in answer to it.

Paragraph 3 with list.

Extract of a letter from the Superintendent, Revenue Survey, to the Secretary to Government, Revenue Department, dated Camp Ootacamund, 12th June 1873, No. 1,333-40, paragraph 3.

* * *

3. I beg to submit a list of maps other than village maps for transmission to the Government of India and also a Memorandum of the probable dates on which district maps on the scale of two miles, = 1 inch will be ready. This Memorandum is, however, merely an estimate. Many unforeseen circumstances may occur to render it incorrect. The refusal of the Supreme Government to sanction an additional Topographical Establishment the estimate for which was submitted pursuant to their own order and the negative to my application for a Manipulator from Southhampton are both drawbacks, on the other hand our having been able in spite of all obstacles to start Photo-Lithography successfully is in favour of the estimate being correct.

Dated 13th May 1872, No 301.

Pay Rupees 150.

* * *

(True Extract.)
(Signed) F. J. B. PRIESTLEY, Colonel,
Superintendent, Revenue Survey.

Enclosure No. 1.—Copy of letter from Superintendent of Revenue Survey, to Secretary to Government, Revenue Department, dated 20th July 1872, No. 1,581-45.

Enclosure No. 2.—Copies of correspondence alluded to in the above letter.

Enclosure No. 3.—Copy of G. O., dated 17th May 1873, No. 495, Revenue Department.

From Colonel F. J. B. PRIESTLEY, Superintendent of Revenue Survey, to J. GROSE, Esq., Secretary to the Board of Revenue, dated Chepauk, 9th July 1873, No. 1,600-79.

In continuation of my letter of the 20th June 1873, I have the honour to submit, for the information of the Board of Revenue, a copy of G. O., No. 495 of the 17th May 1873, (calling on me to report what work has been done apart from Revenue Survey work in the way of topography) and four copies of my reply.

No. 1,321-64.

Dated 12th June 1873, No. 1,333-40.

Enclosure No. 1.—Copy of G. O., dated 17th May 1873, No. 495.

Enclosure No. 2.—Four copies of letter from Superintendent of Revenue Survey, to Secretary to Government, Revenue Department, dated 12th June 1873, No. 1,333-40.

From his letter to the Government of India, dated 22nd April 1871, it appears that the Surveyor-General was called on to submit an economical scheme for utilizing, towards the completion of the Map of India, the valuable geographical materials afforded by the Madras Revenue Survey, and for the Topographical Survey of districts yet unsurveyed. Colonel Thuillier stated that as the Madras Survey is carried out on a proper system, it would be the duty of the Superintendent to generalize and reduce his surveys for the purpose indicated. And he recommended that "some additional Establishment for the purpose of completion, preparation and publication of the result of his survey should be allowed" as it was "desirable that the result obtained should be at once brought into useful form for geographical purposes and the materials incorporated in the new edition of the Sheet Atlas of India." He further suggested that a report be called for from the Superintendent showing the number of districts partially completed, the area already surveyed; also whether he was in a position to commence reduction and compilation of his district maps for geographical purposes, and what additional establishment would be required for the purpose. Acknowledging the heavy duties which devolved on the Revenue Survey, Colonel Thuillier yet thought it would be "true economy to give Colonel Priestley the proper means to bring up some of the heavy arrears of mapping on the smaller scale which forms so great a desideratum after so many years of survey," observing "it rests with the Madras Superintendent to propose what he may deem needful and appropriate." Colonel Thuillier considered that a special officer of the Survey Department should be detailed for "the sole purpose of furthering Geographical Maps * * and working up the survey materials with the necessary numerical data."

2. The Government of Madras had, however, already taken this matter in hand. At the instance of the Board of Revenue (Board's Proceedings, 19th August 1868, No. 5,965), the Government of Madras had sanctioned in G. O., 17th March 1869, No. 720, the measures proposed by the Superintendent for filling up all blanks and completing the District Maps by topographical Survey and with reference to the letter of the Government of Madras to Government of India, dated 8th August 1870, on this subject, Colonel Thuillier stated that the means which were therein described as being then taken to fill up the District Maps were "highly judicious and proper," and he repeated that it would "be money well laid out if the hands of the Superintendent of the Madras Revenue Survey are strengthened so as to make good progress with the four-inches Scale Survey of Zemindari blocks, whereby the Revenue Survey materials so long lying idle may be utilized for geographical purposes and complete District Maps on a tangible scale, rendered."

To Government of India, dated 26th November 1870, No. 533.

3. In reply to these requisitions Colonel Priestley submitted* an estimate for two (2) additional Survey Parties for the topographical Survey of Zemindari and Hill and Jungle tracts not comprised in the Revenue Survey, amounting—with compiling and lithographing establishment for the reduction and mapping of Survey materials—to Rupees 1,07,556 per annum. This estimate was forwarded to the Government of India, under G. O., 22nd February 1872, No. 328, and the reply is the letter now under acknowledgment.

* 6th January 1872, No. 203.

	No.		Rs.
Survey, etc.,	296	... ...	94,500
Compiling, etc.,	36	... ...	13,056
Total ...			1,07,556

4. The Government of India wish — before sanctioning the proposed increase — that the constitution, etc., of the Madras Revenue Survey Department and its work may be placed fully before them and desire to be informed whether the effective collection and regular transmission of geographical materials for the use of the Surveyor-General's Department cannot be arranged for without further increase of establishment.

5. The points on which the Government of India seek information are:—

(1.) The past and present strength and cost of the establishment, specifying successive increases.

(2.) The work achieved in each class of Survey—revenue (16 inches = 1 mile) and topographical (4 inches 1 mile) and the area of land still remaining to be done in each class and scale.

(3.) The financial results.

6. In respect to the more complete and economical utilization of the Department for Topographical purposes, the Government of India suggest that the large scale now adopted in Madras, viz., 4 inches 1 mile, is not necessary for the topographical survey of *waste* cultivated land (not included in the Revenue Survey and Settlement) wherever village boundaries are not delineated—1 inch =1 mile being the usual scale for such surveys elsewhere also that the scale adopted, viz., 2 inch 1 mile, for the Topographical Survey of uncultivated and hill tracts is unnecessarily large, 1 inch 1 —mile being the usual scale elsewhere.

7. The Government of India remark with reference to the proposed Topographical Survey Establishment, that the constitution of Madras Survey parties is unusual in respect:—

(1.) To the proportion of Europeans and Natives, and,

(2.) Unusual number of Native employés.

8. The Government of India further seek explanation why the Revenue Survey of 34,000 square miles of country has as yet produced so little "geographical materials" and why this has been allowed to fall into arrear; also whether this object of obtaining "geographical material" more rapidly could not be attained either by (1) reduction of the scale adopted for topographical survey, (2) re-distribution of work and of the revenue and topographical branches of the establishment, or (3) by changes in the constitution of parties such as need not disturb the main object of the survey. And they intimate that lithographic maps are not needed for geographical purposes; manuscript materials with the necessary mathematical data only being required for the Atlas of India on a scale of the 4 mile=1 inch and should be supplied *pari passu* with the survey.

9. It may be well to explain *in limine* that the Madras Revenue Survey was undertaken for fiscal purposes only, in connexion with the revision of the Land Revenue wherever the land tax is not permanently fixed. Permanently settled tracts and estates, and all extensive tax-free lands were deliberately excluded from the Survey for economical reasons, together with all extensive hill and forest tracts, which were not likely to be required for cultivation within any early period. It was not until the District Maps began to be made up, that the serious geographical defect forced itself on the attention; and in 1863 measures were taken by the Madras Government to extend the Survey topographically, with a view to complete the District Maps and fill up gaps left in them at the expense of the Survey Department both in money and time. These Supplemental Topographical Surveys are proceeding *pari passu* with the Revenue Survey of districts now in hand and greatly increased importance is attached to them by the department in consequence of the Surveyor-General's having adopted them as sufficient for imperial purposes and incorporation into the Atlas of India. The heavy, but blameless, arrear of ten years Survey operations has however now to be dealt with with all earnestness and is the cause of the present correspondence.

10. *Establishment and cost and successive increment.*—The past and present condition of the Survey Establishment will probably be best traced by giving the precise condition thereof under each head as it stood on the 1st April last, and then tracing the various additions by which it has been brought up to this standard.

——	Number.	Total.	Annual cost.	Total
			Rs.	Rs.
Out-door and up-country.				
Survey	2,157	...	4,05,912	...
Demarcation	396	...	89,508	...
		2,553		4,95,420
Add Office Establishment	...	396	...	1,34,592
		2,949	...	6,30,012
Head Office.				
Lithographic Establishment	49	...	88,176	...
Draughtsmen	161	...	19,116	...
		210		55,284
Total	...	3,159	...	6,85,296

11. From the accompaning statement A which is abridged in the margin, it appears that the out-door and up country office Establishments consist of 2,949 persons at a cost of Rs. 6,30,012 and includes, it will be observed, the cost of Demarcation in those districts—Madura, Coimbatore, Bellary and Ganjam—where this operation has been undertaken by the Survey Department at a cost of Rs. 89,500. Nineteen officers are comprised in this statement. The establishment at the Head office includes, with Draughtsmen and Lithographic Department, 210 persons at an annual cost of Rs. 55,284, raising the entire establishment and cost of the Department to 3,159 persons and Rupees 6,85,296 respectively.

Number of Party	Districts Surveyed in whole or in part.	None engaged in.
No. 1 Party	South Arcot, Trichinopoly, Salem, and Coimbatore.	Coimbatore.
No. 2 do.	Godavery and Kurnool.	Bellary.
No. 3 do.	Kistna and Cuddapah.	Cuddapah.
No. 4 do.	Madura, Tinnevelly and Coimbatore	Tinnevelly and Madura.
No. 5 do.	Nellore, Chingleput and North Arcot.	North Arcot.
No. 6 do. (half party.)	Ganjam.....	Ganjam.

N.B.—Demarcation is being performed by the Survey Department in all districts now in hand except Cuddapah.

——	Number.	Cost.
		Rs.
Officers	8	2,227
Head Surveyors, etc.	14	1,317
Deputy and detail do.	41	1,065
Amins.	48	563
Clerks, etc.	63	605
Computers, etc	21	482
Draughtsmen, etc	37	769
Chainmen and other Subordinates	221	1,453
Total...	453	8,480
		12
For one year...	...	1,01,760

N. B.—The above is the average of 5½ Parties now employed.

12. The up-country Survey Establishment is organized in five-and-half Survey Parties which are at present distributed as shown in the margin. Detachments from No. 1 and 4 Parties have been employed in Wynaad (Malabar) and on the Nilgiri Hills.

13. The marginal Statement shows approximately the average constitution of a Madras Revenue Survey Party as it now stands. There have been occasional modifications in the constitution of each Survey Party with reference to the work to be performed by it; and much well judged latitude is necessarily conceded to the Superintendent for local adaptation. But on the whole the statement fairly represents the constitution of a working Survey Party.

14. The Madras Revenue Survey broke ground in 1853 on a small, tentative and educational scale under Colonel (then Captain) Priestley with 49 hands of all grades at a cost of Rupees 1,051 per mensem or 12,612 a year. In 1854 two European Assistants were added to the establishment which was further strengthened, so as to comprise three European Officers and 225 hands all told at a cost of Rs. 39,510 per annum.

15. In 1858 the Revenue Settlement and Survey were taken in hand in earnest. The Director of Revenue Settlement was appointed and a Survey Establishment consisting of four Survey Parties was provisionally sanctioned at a cost of Rupees 2,41,920 including the Superintendent's Establishment at the Head office (Rupees 22,560). The progressive organization and formation of the Parties was naturally slow and the gradual inauguration of their Survey operations only raised the actual outlay to Rupees 1,62,156 in 1861.

16. In 1861-62 greatly increased impetus was imparted to the work of the Survey Department, with a view to expedite the Survey of Districts already in hand—especially the Godavery District. The organization of the Survey Parties was somewhat modified and the strength of several was largely increased. Two additional Survey Parties were sanctioned—at a total cost of Rs. 5,39,142 —exclusive of a variety of charges, which have since fallen on this Budget, including Military Pay and Allowances, Medical Assistance, Office rent, etc. The establishment was gradually but steadily brought up till the year 1866-67, when the Survey Establishment became more or less complete according to its present standard. No material change except the necessary modifications and adaptations already noticed—has taken place either in the organization, strength or annual cost of the Survey Department since that date.

17. In 1866 the Survey Department undertook the demarcation—hitherto performed by the Settlement Department—of several districts in addition to their professional work, and this duty—and its cost has been increasingly transferred, thereby bringing up the establishment and expenditure in the Survey Department to their present standard and, as already explained, Topogra-

phical Survey of extensive non-revenue tracts has more recently been added, to the duties of the Professional Department; without however, any sanctioned increase of establishment. It has practically been performed by diverting no inconsiderable part of the Revenual Survey Establishment and expenditure to these more general objects and accounts in some measure for the increasing degree in which the survey lags behind the urgent needs of the Revenue Settlement Department.

18. *Works achieved in each class of survey and still remaining to complete.*—The accompanying Statement B shows the districts to which survey operations have been extended—partially or otherwise—with the dates of breaking ground; the work achieved and that required to complete it. It appears that Survey operations, more or less complete, have been carried on in eighteen districts including the town of Madras, the Taluq of Wynaad (Malabar) and the Neilgherry Hills. The total area comprised in these districts, is 1,07,815 square miles, which may be classed for survey purposes as in the margin. The area is nearly equally divided between Ryotwari land 55,032 square miles, requiring survey on the 16 inch = 1 mile, and Zemindari and hill and forest tracts, 52,783 square miles to be surveyed topographically on the 4 inch = 1 mile or 2 inch = 1 mile scale.

N. B.—Beliary has only just been taken in hand and preliminary demarcation is going on.

—	Square miles.	Per Cent.
For Revenue Survey	55,032	50·9
Do. Topographical Survey	52,783	49·1
Total...	1,07,815	...

19. Of the area thus already taken in hand, nearly one-half, 47,813, square miles or 44·3 per cent. has been completed in the proportion shown in the margin. In a survey undertaken entirely for fiscal purposes, attention has, until very recently, been directed solely to Ryotwari land, and 36,385 square miles have been completed being 66·1 per cent. or nearly two-thirds of the whole Ryotwari area to be surveyed to the larger scale. Eleven thousand five hundred (11,428) square miles only of the other classes of land have been completed on the lesser scales since 1863; and there is an arrear of topographical survey to bring up of between 18,000 and 19,000 square miles mainly in those districts where the Revenue Survey is either complete or was far advanced before 1863.

—	Square miles.	Per cent.
Revenue Survey	36,385	76·0
Topographical do.	11,428	24·0
Total...	47,813	...

—	As per Establishment.	Surveyed.	Per Cent.
	SQ. MILES.	SQ. MILES.	
Revenue Survey.....	55,032	36,385	66·1
Topographical do. ...	52,783	11,428	21·7
Total...	1,07,815	47,813	...

Arrear of Topographical Survey in Districts where the

Revenue Survey is complete.		Revenue Survey is far advanced.	
	Sq. Miles.		
Trichinopoly	734	Ganjam	6,545
Salem	2,959	Wynaad	919
Godavery	2,832	Neilgherries...	690
Kurnool	1,591		
Kristna	1,658		
Tinnevelly	616		
Total...	10,383		
	8,064		8,064
Total...	18,447		

20. The Revenue and Topographical surveys of two (2) Districts, Nellore and Chingleput, are complete. The Revenue Survey of six (6) districts, Trichinopoly, Salem, Godavery, Kurnool, Kristna and Tinnevelly, is likewise complete, leaving however 10,383 Square miles of Topographical Survey to fill up, and of three Districts, Ganjam, Wynaad, and Neilgherry, the Revenue Survey (comprising 1,474 square miles) is far advanced, leaving however 8,000 square miles of Topographical Survey to bring up. To overtake this arrear, additional strength is indispensable and the expenditure will prove real economy.

—	Sq. Miles.	Per cent.
Revenue Survey	18,647	31·0
Topographical do.	41,355	69·0
	60,003	

N. B.—The average for the last 6 years has been little above 3,000 square miles a year, in consequence of so many detached and special surveys having been required.

21. To complete the districts already in hand, there remain 60,000 Square miles to survey, distributed as per margin. The greater part by far, viz., 41,355 Square miles, awaits Topographical Survey, only 18,647 Square miles will require to be surveyed on the 16 inch = 1 mile scale.

22. The average annual outturn of work during the last twelve years (1861-72 both inclusive) was about 3,417 Square miles, being Revenue Survey, at which rate it will occupy five-and-half years to complete the Revenue Survey of tax-paying land (18,647 square miles). If the time occupied by demarcation be added, say one-and-a half year. Seven (7) years may be reckoned on as the period within which the Revenue Survey of these districts will be completed by the present Establishment. The Topographical Survey of 41,000 Square miles may be completed, were the existing establishment exclusively employed on it at the rate of 10,000 square miles in each year or say in four years. Thus *eleven* years may be taken as the period within which the remainder of the districts now in hand can be finished with the same establishment and annual expenditure. But it is to be hoped that increased liberality will enable earlier completion especially of the topographical part of the arrears without further interference with the very important claims of the Revenue Survey.

23. Great differences have marked the rate at which work has been turned out in different years as will be observed from the statement given in paragraph 26. It has risen as high as 4,900 Square miles and fallen as low as 2,264 in the year. This inequality is mainly due to the casual and partial transfers which special Survey, such as the Wynaad, Nellambur, Neilgherry hills, Ganjam and the like, have necessitated, to the serious delay of more regular work of the Revenue Survey Department. These special calls are now restricted and the averages taken are likely to cover prospective delays and obstructions, if reasonable economy be observed.

24. As regards the scales on which Topographical Survey is now conducted, a 4 in. = 1 mile scale is adopted in inhabited and open country, and 2 in. = 1 mile amongst hills and forests. Of the latter, about 1,100 square miles have been done, the rest of the Topographical Survey, about 10,000 square miles, is on the larger scale of 4 in. = 1 mile. Village boundaries are not delineated in the Topographical maps, but District and Taluq boundaries are carefully settled in the course of the inquiry, involving the decision of many disputes, and delineated and demarcated.

25. Before leaving this part of the subject, it may be well to notice that several districts of the Presidency are not included in the above statement, as no steps have been taken, or probably will be taken, to bring them under Survey at any early date. The area of these districts for Revenue Survey may be roughly estimated at 13,500 square miles and 4,303 square miles for Topographical Survey. The former area may be diminished by probably 3,000 square miles by substituting Topographical Survey of the Hill and wild tracts of Malabar and Canara; leaving 10,000 square miles for Revenue and 8,000 square miles for Topographical Survey.

Estimated Area.

Districts.	Revenue.	Topographical.
	Sq. Miles.	Sq Miles.
Tanjore	3,735	.....
Vizagapatam (proper)	1,000	*4,303
Malabar	†4,842	.....
Canara	3,902	.....
Total...	13,479	4,303

* Exclusive of Wynaad.
† N. B.—Jeypore is being Topographically Surveyed by the Surveyor-General Department.

26. *Financial Results.*—The financial results of the Survey Department for each year since the commencement are shown in the margin in juxta position with the work performed. As above shown nearly 48,000 Square miles including 11,428 Square miles topographically surveyed, have been completed at a cost of 62 lakhs of Rupees or about Rupees 130 per Square mile all told.

Years.	Area in Sq. miles.	Expenditure.	Cost per Sq. mile.
		Rs. A. P.	Rs. A. P.
Up to December 1857	1,259	1,21,822 7 9	96 12 2
,, 1858	620	63,565 0 0	92 0 7
,, 1859	1,563	1,47,186 7 3	94 3 8
,, 1860	3,383	2,77,194 13 1	81 15 0
,, 1861	4,260	4,07,503 15 11	95 10 8
,, 1862	4,902	3,89,613 10 6	79 7 8
,, 1863	4,764	4,16,645 4 10	87 7 4
,, 1864	3,338	4,20,835 8 0	126 1 2
,, 1865	2,956	4,35,258 9 8	147 3 11
,, 1866	2,720	4,78,964 11 3	176 1 4
,, 1867	2,687	5,04,709 6 1	187 13 3
3 Months 1868	849	1,24,681 5 8	320 5 3
1868-1869	2,264	5,09,556 6 10	225 1 2
1869-1870	3,517	4,51,202 11 8	131 2 2
1870-1871	3,678	4,98,201 15 1	135 7 1
1871-1872	3,133	5,53,851 6 7	176 13 4
Up to December 1872	2,499	4,14,826 2 4	166 0 1
	47,900	62,15,530 14 4	129 12 3
Deduct the difference between the estimate and actually incurred measurement allowance	.....	59,737 8 4	... ...
Total...	47,900	61,55,793 6 0	128 8 3

27. It will be observed that considerable fluctuation has characterized the mileage cost of the Survey from year to year. In the early years of more imperfect and less expensive work, several charges now thrown on this budget *e. g.* Military pay and allowance etc. were borne by other Departments and in other respects the present more costly efficiency had not been reached The subsequent rise is due to greater efficiency but also in a very larger degree to the cost of such detached and special surveys at Wynaad, the Neilgherry hills, Ganjam, etc., the cost of which is shown by the following classifed statement to be out of all proportion to the ordinary work of the Department. The causes admit of easy explanation.

Items.	Sq. Miles.	Total cost.	Cost per Sq. mile.
			Rs. A. P.
Revenue Survey 16 inch=1 mile	36,111	55,37,012	153 5 3
Topographical Survey 4 and 2 inch=1 mile	11,340	2,31,613	20 6 9
	47,451	57,68,625	121 9 1
Special Surveys on 16 and 4 inch = 1 mile scale ...	362	5,68,381	1,570 1 10
Total...	47,813	63,37,006	132 8 7

28. These special drains on the resources of the Department are, however, nearly complete and a tendency towards more economical Departmental management is manifest. And the Board learn that the Revenue Survey of parts of the Chingleput District, a difficult district with minute Sub-divisions of property, is now rapidly progressing at a cost somewhat under Rupees 100 per square mile.

Revenue—

	Rs. A. P.
16 in = 1 mile	130 0 0
Topographical—	
4 in = 1 mile	26 12 0
2 in = 1 mile	17 0 0
Sq. Miles.	Rs.
18,647 at 130 Rupees.....	24,24,110
41,355 at 17 Rupees.....	7,03,035
Total...	31,27,145
Add 10 per cent. for contingencies.....	3,12,714
Total...	34,39,859

Statement of area demarcated and cost incurred annually.

Years.	Area demarcated in Sq. miles.	Expenditure.	Cost per Sq. Miles.
		Rs. A. P.	Rs. A. P.
1866	807	61,153 5 9	199 8 1
1867	1,135	84,316 15 7	74 4 7
8 months 1868	114	24,650 10 3	216 9 4
1868-69	968	1,53,259 6 2	155 2 5
1869-70	1,095	1,35,989 13 3	123 14 5
1870-71	2,372	1,15,420 4 9	48 10 7
1871-72	2,050	1,08,062 7 1	52 11 5
9 months 1872	840	71,684 11 8	85 5 5
Total...	8,861	7,54,607 9 9	85 2 7

	Sq. Miles.	Cost.
		Rs
1870-71	2,372	1,15,420
1871-72	2,050	1,08,062
9 months of 1872	840	71,685
Total...	5,262	2,95,167

Average per square mile Rupees 56-1-6.

Survey as per paragraph 29		34,39,859
Demarcation.		
18,647 square miles Revenue	at Rs. 58-8-0	10,90,849
41,355 square miles topographical	at Rs. 1-12-0	72,371
		46,03,079

29. In a recent Statement prepared with reference to carefully collected data, the Superintendent has estimated the cost, including proportion of Head Office charge and lithography of each class of Survey at the rates shown marginally. At these rates the work yet to be performed in districts already in hand will amount to say 35 lakhs.

30. As above noticed the demarcation of land for Survey and Settlement purposes has been increasingly transferred from the Settlement, to the Survey Department; and in most of the districts now in hand, this operation is combined with the professional Survey and being conducted *pari passu*. Since 1866, 8,861 Square miles have been demarcated by the Survey Department and at the expense of this Budget at a cost of Rupees 7,54,608 (Rupees 1,89,774 being the cost of material) or Rupees 85-2-7 per square mile, exclusive of the cost to the cultivators, being the contribution of the Ryots in material (field-stones,) and labour.

31. Many causes co-operated to raise the cost of this operation somewhat unduly in early years. The average of the last three working years shown in the margin, indicates, however, that the Superintendent's estimate of Rupees 58-8-0 per square mile is not over large.

32. At the above rate the cost of demarcating 18,647 Square miles yet to be surveyed, on 16 in = 1 mile scale will amount to say 11 lakhs (Rupees 10,90,849) and the demarcation of the boundaries of Estates and Forests in the course of Topographical Survey would probably add Rupees 1-12-0 per Square mile to the cost of Topographical Survey. Thus the cost of surveying and efficiently demarcating the area, Revenue and Topographical, yet awaiting survey in the districts already in hand will amount to more or less 46 lakhs of Rupees.

33. *Suggestion on Topographical Survey, etc.*—The latter portion of the letter of the Government of India relates to the more rapid preparation of the requisite "Geographical Material" and an explanation is sought of the paucity of these materials and of the arrear of Topographical Survey as compared with the area already surveyed on the larger scale.

34. The accumulation of this arrear of Topographical Survey is not, as already explained, due to Colonel Priestley, but to the strictly fiscal and economical basis on which the survey was commenced. The very natural and proper determination to utilize it for geographical purposes also was more or less an after-thought, and since it was adopted by the Madras Government in 1868, Topographical Survey has received considerable development, despite the very urgent demands of the Revenue Settlement, which has been proceeding *pari passu* with, indeed has unfortunately much outrun, the survey. It is freely admitted on all hands that Topographical Survey ought now to receive unremitting attention with a view to the completion of the District Maps

and the Atlas of India, and it was with this view that the application to which the letter of the Government of India under notice is a reply was made. But the Board think with Colonel Priestley that special arrangements are needed and should be made forthwith and that additional funds should be sanctioned to enable the Department at all events to bring up rapidly the arrears of Topographical Survey still remaining to complete districts, where the Revenue Survey has already been done or is already far advanced. The Topographical Survey of those districts, which are now being surveyed for revenue purposes, must await the lower processes of the Revenue Survey with which it progresses *pari passu*, but there is no reason why the arrears should not be taken.

35. It is obvious to remark that nothing ought to be allowed to retard or throw back the Revenue Survey, as has of late years been too much the case in consequence of numerous special calls on the Department and increased attention to Topographical Survey. The Land Revenue Settlement is dependent on the operations of the survey and has already been seriously hampered and thrown back by the burden lying on the Department which supplies the maps and correct areas on which to base re-settlement of the Land Revenue. As it is, the Revenue Survey is slow and costly and any avoidable obstruction causes such serious loss of revenue and such notable and costly loss of time and money in the Settlement Department, that no risk can be incurred. The present Survey Establishment is fully employed with the Revenue Survey and cannot be spared to bring up rapidly the arrears complained of by the Surveyor-General. The increase now sought should be admitted in consideration of the large public interests involved.

36. The Board agree with Colonel Priestley that the requisite special arrangements for bringing up the Topographical Survey can only be carried out economically and efficiently under the superintendence of Colonel Priestley, and by his already trained and experienced Assistants. They know the country, which they are already engaged in Surveying, and they are familiar with the people and language. The organization of any increased establishment and the expenditure of any money sanctioned with this view, should be entrusted to the existing Department. The Board would therefore support the application made in G. O., dated 22nd February 1872, No. 328, to the extent of at least one additional Survey Party to be employed under Colonel Priestley exclusively in bringing up arrears, at a cost of say Rupees 50,000 a year.

37. As regards the suggestions made by the Government of India, having in view this needful expedition by reduction of the scale on which Topographical Survey is now performed. The Board would remark that neither demarcation nor delineation of village boundaries accompanies Topographical Survey, and they see no cogent reason why—since it appears that the Surveyor-General would be satisfied with the smaller scale—the 2 inch = 1 mile should not be adopted for all Topographical purposes. It is much more expeditious and somewhat less costly than survey on the 4 inches = 1 mile scale. The Board therefore recommended that a scale of 2 inches = 1 mile be adopted for all Topographical survey.

38. The Government of India make some remarks on the constitution of the Madras Survey Party and the comparatively liberal employment of natives on sundry work. The Board do not think that any serious or sudden alteration in the organization of a service already nearly twenty years in the field, could be made without seriously hampering operations and causing great dissatisfaction and discontent amongst a very numerous body of men, many of whom count long service. And they think that officers so experienced and successful as Colonel Priestley and his Assistants may well be left to adopt such Departmental and personal arrangements as experience has taught them are most effectual and economical. The natives of this Presidency make, under good supervision, admirable Surveyors, and the Board would be unwilling to deprive these intelligent races of this congenial employment in the service of the State.

39. The Board think that Colonel Priestley has in his letter, dated 20th July 1872, shown conclusively that the Lithographical establishment is indispensable for the work of this Presidency.

It must therefore be continued in order that the Topographical Survey may be made available for the completion of the District maps.

(True Copies and Extract.)

H Woodburn,

Acting Secretary.

To the Acting Secretary to Government, Revenue Department,
with nine enclosures and two Statements A and B.

,, the Superintendent of Revenue Survey, with Statements A and B.

Copy to the Director of Revenue Settlement, with do.

Revenue Settlement Office,
Madras,
14th October 1873.

No. 2274-
57

From Geo. Bomford Esqr.
Director of Revenue Settlement.

To The Hon'ble C. S. Bayley
Secretary to Government
Revenue Department.

Sir,

I am accordingly with the
x
orders of Government, desired
to submit by 20th May 1872, which were
communicated to me by
his report upon the present
and future working of
the Survey, together with
a Memorandum of the
15th October 1872.

Colonel Priestley on the 4th
of June last, together with
his report upon the present
and future working of
the Survey, & Memorandum
dated 15th October 1872.

Rec'd 1873 Sept
1873. Board of Revenue,
MADRAS.

PROCEEDINGS, 2ND SEPT. 1873, No. 1,729.

Encl. 7

S.O. No 574 - 11 May 74
L. No 582 A - 11 May 74.

Received 2nd Sept 1873

SEPTEMBER.

No. 1,729.

Revenue Survey.—Report submitted to Government on present and past strength and cost of Survey establishment, work achieved in each class of Survey, financial results, etc.,—Additional establishment recommended to be sanctioned for bringing up arrears of topographical Survey.

135.
c 11 Oct 73 & 30 Oct 73 R 610 nm

remarks.

Past Working

Farmer para extract 2.

In para 2 of the report on the History of the Department Colonel Priestley writes "In every case the Revenue authorities were compliedly at the mercy of the Kurnum, who interpreted the Paimashes cards as they thought fit."

If this is intended to embrace native Revenue officers the narrative is I think hardly correct, as the native servants such as Karkons, Revenue Superintendents and Peshkars, were, as a rule able to hold their own with the Kurnums, and successfully conducted both examinations of concealed cultivation and settlement of disputes without any great difficulty.

Hill Demarcation.

In para 3 Colonel Priestley writes that "The line dividing Ste Clare from Kurnool and Kistna has been demarcated by the Survey, the Settlement department having declined to undertake it as duty. The long delay in settling and defining the boundary line between this District and Cuddapah has hitherto stood in the way of the completion of this District map of Ste Clare."

It must be remembered that this task of Hill and Boundary demarcation was not undertaken until the receipt of Government orders dated 3rd September 1865, by which time our Employés had completed the Districts referred to and passed on elsewhere. I give the accompanying Extract from a letter from the Collector of Kistna Letter dated 24th June 1869 No 843 Master my predecessor to Colonel

Colonel Priestley upon this subject which explains all clearly enough.

"The demarcation of the Kurnool District has been completed according to the hitherto existing Rules, and to the full extent required for Revenue or Settlement purposes. What is now required to be done has no connection with the Revenue or the Settlement, but is purely for Survey purposes in order that topographical details may be filled in, in the gaps of the District maps, and the latter made perfect. This being so, and the demarcation generally having been transferred to the Survey Department, which Department must be far the best judges

judges of the kind and extent of Demarcation necessary for the execution of the topographical work required, and consequently must be best able to perform it, I consider that the task naturally and appropriately falls to that Department aided if necessary by the local officers".

As regards the long delay in settling the boundary line between Cuddapah and Kurnool, the numerous intricate and hitherto quiescent disputes which sprung into existence upon our beginning to mark out the correct limits were the main cause of delay. In fact it took Mr. Baker an energetic young officer, with powers under the Act, about 4 months to settle 5

of these disputed. But now progress of survey on this line has been arrested by an injunction from the Civil Court, owing to a suit having been filed by the bordering parties in an important boundary case settled by this Department. This delay has thus been unavoidable, and I apprehend the same causes have militated against the definition of boundaries in the Survey Department as I do not hear of the map of any one district having been entirely completed.

Demarcation by Settlement Department.

Para 5. "The demarcation (by the Settlement Department) [illegible]

Kistna and Trichinopoly all demarcated by this Department, went

the first found unsuited to Survey requirements."

on more rapidly and were completed in a shorter time than in Tanjam and Coimbatore districts demarcated by the Survey themselves. Colonel Priestley has not only borne testimony officially to the goodness of the work, but requested us to undertake demarcation in Bellary after this task had been formally transferred to his Department. Such could hardly have been the case had our demarcation been "unsuited to Survey requirements". Inward, if the Settlement demarcation had been so bad as

Letter to Director 4th August 1869 No 1929.

as this, the survey which was based thereon could not possibly have been so wonderfully good as it is. I am not for a moment wishing to uphold the earthen mound demarcation of past days against the permanent stone demarcation of the present, but the former certainly answered its purpose as a basis for the survey to work upon, at a time when the cost of more permanent marks would have been objected to, the benefits thereof not then being so fully recognized as now.

Minor holdings in Survey fields. 5

Para 111 "Fields included within Survey fields are, where they exist, measured by the Settlement Department

Any one unacquainted with the subject would think from this that the existence

Department after Survey operations have been closed."

of these minor holdings in Survey fields was of somewhat rare occurrence, whereas in truth they are so numerous that their measurement, the calculation of their areas, and their correct entry in our Registers is a most laborious and important task. Thus last year we dealt as above explained with no less than 136,409 of these minor properties in 45,699 Survey fields. During the year previous the figures stood at 111,827 and 38,491 respectively.

Measurement of minor holdings as formerly conducted. 6

Para 112. "In all districts first taken up for Survey the measurement of intersticial fields

Some error has crept in here, for I well remember as

fields was performed by the Survey Department."

as Deputy Director having charge of this branch of work in 1858, and being aided in its execution by Colonel Keeney, then Deputy Superintendent of Survey. Mr. Puckle my successor also carried on the task in Trichinopoly. Unless I am much mistaken the Survey undertook the work in part of Salem and part of Trichinopoly and retained charge thereof for about a year or so.

Excess discovered by Survey.

Para 11 "In reply to a call from the Board of Revenue in 1870, the Superintendent supplied what information he possessed on the subject of the credit due to the Survey in

as far as can be gathered from the annual reports the expenditure excluding cost of boundary pillars up to the

5

67

'in bringing to account unassessed areas. At that time, it was shown that taking 2 Rs per acre as the average assessment of land in the Madras Presidency, an annual increase from this cause had accrued to the assessed area, of the same amount as had up to that date been expended on Survey operations" Para 118. "The expenditure had been about Rs 4,000,000, and the increase discovered by Survey of the assessed area was 2,000,000 acres or a little over 3,000 square miles, the mean percentage of increase being 11"

the end of 1870 comes to about Rs 55,00,000 and as it is not in reality practicable to charge with new assessment anything like the entire area brought to light by Survey, these results as to gain by Survey can hardly be accepted. Thus I lately in my report on Tanjore explained that in the case of wet lands the old assessment was fixed upon what is termed a "karay" or

or well defined limit, and that is the demand there fixed was as much as this block could possibly pay, no amount of surveying could enable us to derive more Revenue therefrom. The same with dry lands. In many parts of Salem although during the Settlement the average of the new rates based upon the Survey areas was frequently lower than that of the rates formerly paid, it was nevertheless found that the former would be oppressive, as by charging the excess area, which had alone enabled the holders to carry on, the assessment would have been more

than

than the land could bear. or in other words they could afford to pay Rs. 6 for the old nominal acre which was in reality an acre and three quarters, but could not afford to pay Rs 1. 4. 0 for the exact acre and nothing more. Again the Survey increase falls as a rule more upon the poor outlying lands than upon the rich home fields, and more upon the inferior than the superior villages. I noticed the latter feature particularly in the case of the Pattiondah taluq the last I settled. It will be seen from the following figures that in this taluq the increase on the rich Regád or black cotton soil

villages

Villages is but little, but that the excess by Survey appertains to the fenced red soil tracts.

Groups	Area as per Accounts Actually settled 1282	Area new measurement	Difference	Remarks
	1	2	3	4	5
1st Group	41:790	42498	+ 708	+1.69
2d Do	111:805	112:620	+ 815	+0.74
3d Do	86:320	95:997	+ 8:677	+10.17
Total	239:915	263:875	+ 17:900	+7.20

Fenced & Marking.

8. My remarks upon the second portion of this subject, which refers to certain modifications proposed to be made in the mode of conducting the Survey, must necessarily be brief and be put forward with some hesitation as they relate to the marking of a Revenue Department.

9. The first of the two main modifications placed before

the Madras Government is the following:—

"Whether the scale upon which the topographical details are conducted in cultivated tracts amidst Ryotwary Lands might not be reduced from 6 inches to 1 inch to the Mile."

This question is, it appears to me, connected with that of the detail or topographical Survey of Lands in Government villages which is now conducted on a scale of 6 inches to the mile for the Village maps, and often reduced first to two inches, and subsequently to one inch for the Taluq maps. If the one inch scale is to be adopted as suggested by the Government of India for "cultivated tracts," this standard would presume extended also to the details

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in Ryotwari Villages, so that the whole of the topographical work of the Taluq would be laid down by plane table at this scale of one inch to the mile, and the Village details would thus no longer be represented in the 16 inch maps. If any great saving in cost were likely to ensue by this mode of conducting work, it would no doubt be well worthy of consideration, but as far as I understand, the cost of plane tabling at one inch, and of detailing at 16 inches as now carried on upon the Village maps is very much the same, about 9 Rs the square mile for field work in either instance.

Similarly

Similarly as regards Office work, the cost of reducing from the 16 to the 1 inch scale is not greater than the cost involved in plotting the plane table squares in the first instance, for the use of the Surveyor in the field, and then compiling them when returned by him to office. Very probably by Colonel Priestley's new process the cost of reducing the Village details from the larger to the smaller scale is even less than I have supposed it to be. If such be really the state of affairs it would be certainly bad policy for us to look these details from the Village Maps.

10. I must however admit that I can hardly agree with Colonel

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Colonel Priestley in deeming the inclusion of these details in the Village maps to be absolutely necessary in order to enable the Revenue officers to find the fields, nor in thinking that half the day would be wasted in this search were these aids not forthcoming. Where the demarcation is good the field wanted is soon found with the aid of the Land Register which gives the name of each occupant. The manigar or karnum can also at once point out his own, or the Pagoda Inam, and there is a starting point gained in five or ten minutes. Again there is always a theodolite station not far off to start from, and the Khundum

Khundum lines are sure and safe guides. As examples of the foregoing it may be mentioned, that under the combined system of classification and demarcation carried on by this Department the farmer operation is conducted upon the plain field sketch; that in the Perinthoray Taluq we classified each field upon rough sketches; and that the topographical details are not given in the maps we are about to use for classification in Pallavaram and Bowany. Moreover it must be borne in mind that these maps are for the most part used by those who have some knowledge of their duties, and to whom

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in fact, after the old pay-
master even these rough
sketches are a treat and
a luxury. Still as I have
already said, if these topo-
graphical details as now
furnished cost no more
than plane tabling upon
the one inch scale, I would
certainly advocate their
retention as with them
the maps look complete and
businesslike, without them
blank and unfinished.

11. However, let this question
be decided as it may, I
would certainly advocate
that, both field and detail
work should be carried on
as hitherto under Colonel
Priestley's superintendence,
otherwise the outlay will
be enhanced, and complica-
tions to the detriment of

good progress and good
feeling will most likely
very speedily arise. It
must be also remembered that
Colonel Priestley's officers
are well acquainted with
the people with whom they
have to deal and with the
country in which they have
to work, and thus know
well how to overcome local
difficulties, and how to take
full advantage of local
facilities. Moreover no
one has ever urged that
the work performed by the Mam-
Survey is of an inferior
description, the usual
complaint has been that
it is too good.

12. Finally with regard to
this question, might it not
be practicable for Colonel
Priestley

Priestley to experiment upon the one inch scale as well, when making the trial as promised on the two inch for these cultivated tracts. If the one inch can be marked upon, it would fit at once into the Taluq map, and this scale is ample for showing the boundaries of Villages, Rivers, Hills and other important geographical details. Moreover as the 16 inch topographical work can, I imagine, be now reduced to one inch by a single operation, there is perhaps no longer the same necessity for this intermediate stage of 2 inches.

Letter to Govt. dated 20th July 1872 No. 1584/45 para 11.

13. The second proposal for

for the consideration of the Madras Government is, "whether the topographical details as to uncultivated tracts cannot be surveyed at 1 inch to the mile instead of two."

As these details are mainly required for filling in gaps in the maps, I do not see why the one inch scale should not be adopted, and the whole fitted into the Taluq map now drawn to this standard. Might not Colonel Priestley therefore give this standard a trial in uncultivated, hilly and jungly ranges, as he is already prepared to do with the 2 inch scale in cultivated tracts? The present Taluq maps at one inch show all we require

to

to be delineated and if the work were done throughout upon this scale of one inch in the first instance the task of reducing for the District map at 4 miles to the inch would, I apprehend, be simplified, as there would be only one reduction instead of two as under the present system.

14. In connection with this subject, comes the question of the necessity for regular and systematic demarcation in jungly tracts, on hill tops far distant from any habitations and in Zemindary Estates. It may be said with regard to the first and second cases that when the Taluq

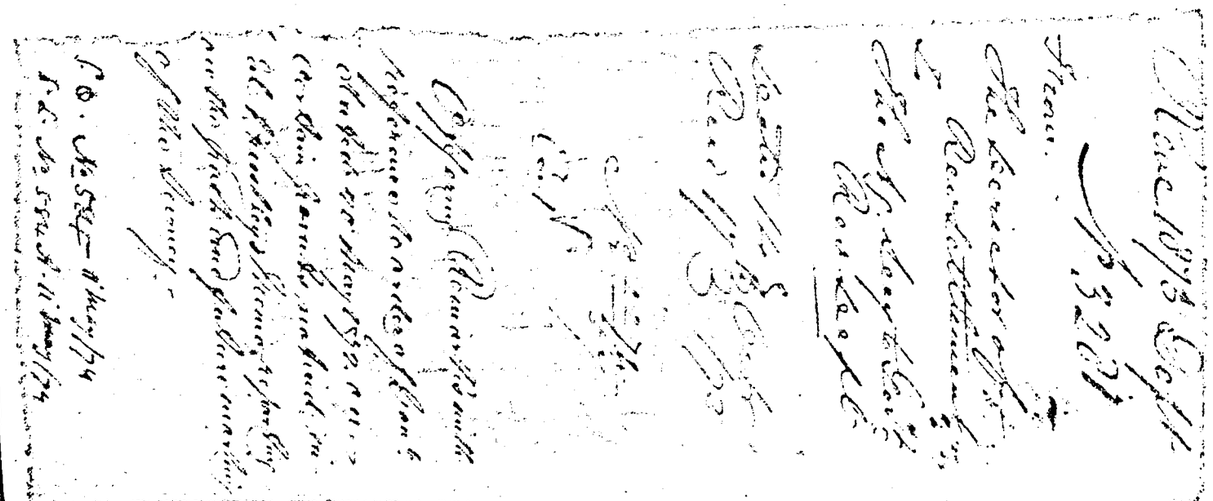
or District boundary line has to be defined, jungle, and distance must not stand in the way, but there must be many tracks where this definition is quite unnecessary, as tigers and other wild beasts are the only residents, and they certainly need no consideration under this head. In such cases might not the necessary details be obtained from the Ordnance map? With regard to the third point as to the demarcation in Zemindary Estates, it would appear that as surely topographical survey is now evidently advocated, there is no necessity hereafter for regularly

regularly demarcating roads, Railways, canals &c. which could be laid down by plane table with the aid of occasional Astronomical observations required for the points of intersection.

5. Finally as to the large number of natives retained by Colonel Priestley as noticed in para 2 of the Under Secretary's letter. The reasons for this are, I take it, economy, facility of management and patience under instruction. Natives will be content with less salary, are as a rule most amenable to orders, and will remain on quite contentedly with a succession of wages, thoroughly training themselves for the

higher grades with the hope of eventually succeeding thereto. As far as I can judge Colonel Priestley has an able staff of native subordinates and had he found the work progress better under other agency he would doubtless have more largely resorted thereto.

I have the honor to be,
Sir,
Your most obedient
Geo Rainsburg.
Director of Rev. Settlement



AN ACCOUNT OF THE MADRAS REVENUE SURVEY ESTABLISHMENTS, OF THE WORK PERFORMED BY THEM, AND OF THEIR PRESENT OPERATIONS.

SUBMITTED IN OBEDIENCE TO G. O. DATED 20TH MAY 1872.

INTRODUCTION.

1. In 1853, the only Maps of the Presidency in existence were those prepared by the Military Institution from which the sheets of the Atlas of India had been compiled, and Maps of individual Collectorates on a small scale. A Revenue Survey had not been attempted. In almost every part of the Presidency, there had been a Paimash or recorded measurement by pole which, in official records, was often called a Survey. The Paimash or Survey varied, in accuracy, in different Districts. It had, in no district, been conducted on European principles of Surveying, nor had, in any case, maps been prepared showing the position and extent of the land measured.

2. In some district, the Paimash had become almost totally useless. In every case, the Revenue authorities were completely at the mercy of the Curnum, who interpreted the Paimash records as he thought fit.

3. A measurement through the centre of a field from North to South, and another through the centre from East to West, together with the numbers of adjoining fields, were the only records by which any particular plot of land could be identified.

4. For many years, a Revenue Survey had been in progress in the Bombay Presidency. A Revenue Survey had been carried on in the North West Provinces and in Bengal.

5. The principles on which the Surveys abovementioned had been conducted did not appear suited to the peculiar circumstances of this Presidency. In the North West and in the Bengal Presidency, the accuracy of measurements of individual fields seemed not to be sufficiently considered. In Bombay, the importance of making a Revenue Survey useful for Geographical purposes appeared to have been lost sight of.

6. The services of Captain PRIESTLEY of the 25th K. O. B. were, in the year 1853, placed at the disposal of the Revenue Board in view to his training a Survey Class, and submitting, for the approval of the Board and Government, maps of villages surveyed under certain conditions laid down by them. Surveyors were so scarce that the only persons who had any knowledge of Surveying, and who were available, were a superannuated Plane Table Surveyor, formerly in the Topographical Survey Department, and a young Ordnance Artificer trained in the school of that Department. Captain PRIESTLEY commenced work in the South Arcot District. After the survey of several villages had been completed, the maps and records were sent for the inspection of the Revenue Board.

7. With the exception of Captain PRIESTLEY's proposal to connect his work with the Great Trigonometrical Survey, and of some arrangements he had been compelled to adopt for want of suitable * Instruments and Establishment, the system on which

EXPERIMENTAL SURVEY

		Rs.	As.	P.
1.	Captain F. J. B. Priestley.	200	0	0
1.	Mr. McMahon Surveyor ...	265	10	0
1.	Mr. Starr Superintendent...	50	0	0
14.	Carkoons @ 17½ Rs. each...	245	0	0
14.	Do. @ 12 Rs. each ...	168	0	0
2.	Writers @ 12 Rs. each ...	24	0	0
1.	Plan Drawer @ 17½ Rs. } ...	29	8	0
1.	Do. @ 12 Rs. }			
1.	Goomastah.....	15	0	0
1.	Duffadar or Head Peon.....	6	0	0
12.	Peons @ 4 Rs. each	48	0	0
	Total Rs...	1,051	2	0

* Note :—The largest instrument in Captain Priestley's possession was a 5 Inch Theodolite. He was provided with *brass* chains made at the Gun Carriage Department for traversing, and Bamboo poles of 24 feet for field measurement.

he had been working was approved by the Board and may be briefly described as follows:—

I. To have the village boundaries of a talook marked out by the Rev. authorities and permanent pillars of masonry erected at each Theodolite station.

II. To lay out Grand circuits of 50 or 100 square miles and survey the boundaries of villages and subdivisions of villages within them by Theodolite and Chain, ascertain the true bearing of lines at intervals by observation, plot on the scale of 5 chains = 1 inch and compute the content (in acres) of the village and subdivisions by traverse. Plot the fields (of 2 acres and upwards) measured by Chain within the boundaries of villages and their subdivisions.

III. The test of the correctness of field measurements was their plotting exactly into the boundary laid down beforehand; of field areas, their gross content equalling the area by traverse.

IV. The Topographical details and such parcels of land as did not admit of Khusreh or detailed field measurement by chain alone to be laid in by Chain and Compass, the expense of Topographical survey being merged into that of the Khusreh.

Selections from the Records of the Madras Government No. IX.

8. This system with slight modifications and improvements has continued to the present day.

9. The Deputy Surveyor General in a letter to the Government of India, reviewing the tentative operations in South Arcot during 1853 & 1854 reported on in Selections from the Records Madras Govt. No. IX, points out the necessity of connecting any survey in Madras with the Great Trigonometrical Survey Stations, of working on a true meridian, of making provision for a topographical survey of such lands as are not included in the field-war survey; and remarks the total absence of any establishment or machinery for demarcation. In all other respects, he considers the Madras system worthy of admiration.

Selections from the Records of the Madras Government No. LIII

10. A Temporary Establishment under Captain PRIESTLEY was sanctioned by the Supreme Government for 2 years and * 2 Officers were attached to the party to be trained in the method of working. In granting sanction † however, it was observed by the Governor General in Council that "His Lordship's only doubt in respect to the scheme of survey has arisen from the known difficulty of plotting fields from a Khusreh Ameen's return within an exterior boundary laid down by Scientific Survey."

TEMPORARY ESTABLISHMENT

* Lieutenants HESSEY 21ST N. I. & PRATT 84TH FOOT.

† G. O. G. I. No. 3420 dated 8th Sept. 1854

	Rs.	As.	P.
1 Captain F. J. B. Priestley	575	0	0
2 European Assistants ...	400	0	0
1 Mr. Starr Head Surveyor	70	0	0
2 Hd. Surveyors or Artificers @ 70 Rs. each.....	140	0	0
6 Deputy Surveyors 80 Rs. each.....	180	0	0
30 Survey Amins from Rs. 17½ to Rs. 20...	562	8	0
30 Amins & Goomastahs 10 Rs. each.....	300	0	0
3 Writers 25 Rs each.....	75	0	0
3 Draughtsmen .20 Rs. each	60	0	0
3 Duffadars 7 Rs. each....	21	0	0
126 Measurers from Rs. 4 to 5 Rs.	528	0	0
3 Computers 20 Rs. each...	60	0	0
18 Peons from Rs. 5 to 7 Rs....	96	0	0
Travelling allowance or tentage and batta to Head and Deputy Surveyors, Amins and Goomastahs.....	225	0	0
	3292	8	0
Additional Contingent charges	37	8	0
Total per mensem,	3330	0	0
For 12 months,	39,960	0	0
Deduct 2 Months batta not drawn.....	450	0	0
Net Amount...	39,510	0	0

Square Miles 1293.

11. This Establisment was maintained till 7th March 1858 and turned out work at an average cost of Rs. 86-3-5 per square mile.

12. The method of field measurement proposed by Captain PRIESTLEY and described at Page 40 of Sel: Rec: Madras Government No. IX under the title of the "*Combined method*" was tried by this Temporary Establishment. It consisted in measuring the fields by Chain and Cross staff and plotting them within a boundary already drawn beginning at a corner of the boundary and continuing to plot from the boundary inwards. It was not found so suitable as that of measuring 4 sides and a diagonal, being incomprehensible to the ryots who raised objections to it and to offsets being taken through standing crops &c., It was more difficult to train men to it, and unless the measurement & offsets were very accurate, the plot would not close.

13. In his report on the work of the Survey during 1856, the Officer in charge mentions that the boundary demarcation was performed in so unsatisfactory a manner by the Talook authorites that he was compelled to set on foot a small establishment for the purpose, from among his own subordinates at a monthly cost of Rs. 85. He also describes the field demarcation performed by the Survey Ameens to consist of a wooden picket surrounded by a heap of earth at the corner of each field. This was found to last for about a year, unless intentionally removed, sufficiently long in fact to admit of test and correction. He points out that at the desire of the Collector of South Arcot, every field had been measured and plotted down to 0·06 Acre, and that if this minute Survey was considered necessary, a larger scale for maps would be requisite, that of 3 Chains = 1 inch being recommended. The Great Trigonometrical Survey Records were received too late in the year to be made use of in connecting work in South Arcot with the Great Trigonometrical Survey Stations.

SCHEME FOR GENERAL SURVEY OF THE PRESIDENCY SANCTIONED

Selections from the Records of the Madras Government No. LIII.

14. In the meanwhile, the want of an accurate measurement of lands being universally felt and its necessity unanimously admitted; a scheme for the General Survey of the Presidency was sanctioned by the Court of Directors after considerable correspondence between the Board of Revenue, the Government of Madras, the Government of India & the Court.

15. The scheme embraced the production of field, village and talook maps to secure the permanency of the sanctioned survey. The area of the Presidency was estimated at 120,000 square miles requiring to be surveyed for area, but only one half or 60,000 would, it was thought, come under the minute or field survey at a cost of Rs. 64 per square mile and would occupy 22 years in execution.

16. The Madras Government, in giving detailed instructions, express their opinion "that the survey should decidedly be a perfect one" and "that every particular of Topographical or Revenue importance should be exhibited and no expense will be vain to secure perfection in these two respects." They also approved of the scales to be used for Village, Talook and District maps.

SCHEME FOR GENERAL CLASSFICATION & SETTLEMENT SANCTIONED

17. At the same time, a sum of Rs. 38,40,000 was sanctioned for the Classification and Settlement of the Presidency at an average rate of Rs. 64 per square mile.

18. In June 1857, Captain PRIESTLEY was appointed to superintend the proposed survey and directed to submit a plan of operations and list of Establishment. Mr. NEWILL of the Civil Service was gazetted Director Revenue Settlement.

19. In the year 1858, revised estimates were prepared and sent in. In these estimates, it was calculated that the Survey and Settlement of the whole Presidency would be completed in 14 years at a total cost of Rs. 76,40,000 or Rs. 118 per square mile. The decreased rate was to be attained by increasing the number of men in the lower grades, leaving the Officers at the same strength as in the original estimate.

	Rs.	As.	P.
1 Deputy Supt.....500 Travelling Allowance... 75 Contingent charges.....100	675	0	0
1 European Assistant.....325 Travelling Allowance... 75	400	0	0
1 European Assistant.....225 Travelling Allowance... 75	300	0	0
4 Head Surveyors from Rs. 70 to 100 Rs.....	340	0	0
8 Deputy Surveyors from Rs. 30 to 50 Rs.....	290	0	0
4 Detail Surveyors from Rs. 20 to 25 Rs.....	85	0	0

See letter from H. Forbes Esq. Actg. Secy to Govt. to Govt. of India dated 25th January 1858. No. 97 para 12 page 323 Vol. LIII Selections of Govt. records.

For Settlement per agr. M.	51	0	0
,, Demarcation Do.	10	0	0
,, Survey Do.	55	0	0
,, Lithographic Dept. Do.	2	0	0

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Selections from the Records of the Madras Government No. LX.

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19. In the year 1858, revised estimates were prepared and sent in. In these estimates, it was calculated that the Survey and Settlement of the whole Presidency would be completed in 14 years at a total cost of Rs. 76,40,000 or Rs. 118 per square mile. The decreased rate was to be attained by increasing the number of men in the lower grades, leaving the Officers at the same strength as in the original estimate.

See letter from H. Forbes Esq. Actg. Secy. to Govt. to Govt. of India dated 25th January 1859. No. 97 para 12 page 338 Vol. LIII Selections of Govt. records.

For Settlement per Sqr. M.	51	0	0
" Demarcation	Do.	10	0	0
" Survey	Do.	55	0	0
" Lithographic Dept.	Do.	2	0	0

20. The Settlement Department was entrusted with the duty of demarcation. Demarcation parties were formed and commenced work under the orders of Messrs. BANBURY and MASTER in South Arcot, Trichinopoly and Rajahmundry.

21. In 1858, Lieutenant HESSEY was appointed Deputy Superintendent Revenue Survey of the first party & Captain CREWE 1st Assistant Superintendent was sent to Rajahmundry where he received charge of the second party which had beenthen set on foot by the Superintendent. A third survey party was organized in Masulipatam by the Superintendent and in 1859, was handed over to Captain PRATT 84th Foot promoted to be Deputy Superintendent.

22. A Revenue Survey of the Wynaad being considered absolutely necessary by the local Government, they directed that immediate measures should be taken for commencing the Survey of that talook. A fourth party was commenced before the end of 1859 under Captain HESSEY temporarily detached for the purpose.

	Rs.	As.	P.
40 Survey Ameens from Rs. 10 to 14 Rs.	440	0	0
40 Gumastahs from Rs. 7 to 9	310	0	0
1 Office Manager	75	0	0
1 Head Writer & Computer	35	0	0
9 Writers & Computers from Rs. 15 to 25 Rs.	190	0	0
1 Head Draughtsman	50	0	0
15 Draughtsmen from Rs. 15 to 35 Rs.	325	0	0
3 Duffadars or Head Peons from Rs. 7½ to 8 Rs.	23	0	0
27 Peons from Rs. 4 to 6	125	0	0
55 Measuring Peons from Rs. 4 to 5 Rs.	247	0	0
25 Station Markers from Rs. 4½ to 7 Rs.	121	0	0
4 Muchies from Rs. 4½ to 5½.	19	0	0
1 Blacksmith	5	0	0
1 Chuckler or worker in leather	5	0	0
Measurement Allowance	630	0	0
Total	4690	0	0

23. After the general survey was sanctioned, No. 1 Party, under Lieutenant Hessey, not only completed what remained in the partly surveyed talooks of the South Arcot District but also executed by the close of 1859, a survey of 650 square miles, or in all 1891 square miles, as per margin, completed since the commencement of the survey.

South Arcot	514
Trichinopoly	1377

24. In 1859, work was provided by the Settlement Department in the Namakal talook although the survey of the Trichinopoly District was still incomplete. The survey of a fifth district (Salem) was thus undertaken, an arrangement which required the Deputy Superintendent in the South to supervise men employed in two districts.

25. The survey of 2939 square miles of the Trichinopoly District may be said to have been completed before the close of 1861. In subsequent years however, the measurement of additional cultivation was undertaken by the survey.

26. The survey of the Salem, as well as of the Coimbatore, District (the latter taken in hand to provide work for Surveyors returned from Wynaad there being no demarcation ready elsewhere) was delayed by defective demarcation. The extent of country surveyed by Lieut. Colonel HESSEY's party in the plains up to 31st December 1872 is as follows:—

South Arcot	514	Square Miles
Trichinopoty	2939	Do.
Salem	4531	Do.
Coimbatore	3645	Do.

ANACCOUNT OF THE MADRAS REVENUE SURVEY FROM ITS SANCTION IN 1858 TO THE YEAR 1872 INCLUSIVE.

HISTORY OF No 1 PARTY

SCALE

	Rs.	As.	P.
1 Deputy Superitendent 500 Travelling Allowance 75	575	0	0
1 European Assistant... 350 Travelling Allowance. 75	425	0	0
1 European Assistant... 250 Travelling Allowance. 75	325	0	0
1 Sub Assistant	150	0	0
8 Head Surveyors from Rs. 50 to 100	580	0	0
12 Deputy Surveyors from Rs 30 to 50 Rs.	450	0	0
6 Detail Surveyors from Rs. 20 to 25 Rs.	135	0	0
60 Ameens from Rs. 12 to 14 Rs.	780	0	0
60 Gumastahs from Rs. 8 to 10 Rs.	510	0	0
1 Office Manager	100	0	0
1 Head Writer & Computer	50	0	0
11 Writers & Computers from Rs. 15 to 30 Rs.	268	0	0
1 Head Draughtsman	75	0	0
19 Draughtsmen from Rs. 15 to 50 Rs.	485	0	0
2 Duffadars or Head Peons @ 10 Rs.	20	0	0
13 Peons from Rs. 7 to 8 Rs.	93	0	0
140 Peons, measurers including @ Rs. 6 each	840	0	0
4 Muchis from Rs. 5 to 8 Rs.	23	0	0
1 Blacksmith	5	0	0
1 Chuckler or worker in leather	5	0	0
Measurement Allowance	768	13	4
Total	6684	13	4

HISTORY OF No 2 PARTY

SCALE, SAME AS THAT OF No. 1 PARTY

27. The party in Rajahmundry commenced its operations in September 1858, and completed before March 1863, the Survey of the Ryotwary villages in 9 talooks, composing the present Godavery District, representing an area of 3392 square miles. Certain portions of the District were excluded from demarcation by the Settlement Department, and consequently not undertaken by the survey; the field of operations being determined altogether by the Director Revenue Settlement with regard to its advantage in a Revenue point of view. All that could be effected under these conditions, therefore in the excluded tracts was the survey of main roads and adjacent chief topographical details.

28. In G. O. No. 1594 of 23rd November 1859, the Director Revenue Settlement was desired in communication with the Superintendent Revenue Survey, to report upon the additional means proper to be adopted for expediting the survey of the Godavery and Kistna Districts. Arrangements were accordingly proposed and sanctioned, by which the strength of the Northern parties was raised. An auxiliary party of half the strength of a full party at a cost of (Rs. 43,923 per annum) was organized in the Godavery District. The proposal by the Director Revenue Settlement to relax the rigid standard of accuracy enforced in village maps was approved of by Government though earnestly deprecated by the Superintendent. In practice, however, the maximum error has not exceeded 1·48, and the average error, is 0·48 per cent.

29. In 1859, a detachment from No. 2 Party was drafted to Kurnool to commence operations there under Lieutenant PAYT 74th Highlanders. The remainder of the party followed, as work was completed in Rajahmundry.

30. The survey areas and maps of villages coming under the influence of the Irrigation and Canal Company's operations being those first required, surveyors were necessarily much scattered along the line of Canal. To this and to the boundaries of talooks being left un-demarcated, is attributable the non-completion of the survey of many of the talooks up to the present date. Surveyors were also required in Kurnool to sub-divide fields for the convenience of irrigation accounts and to measure puttah holdings.

Godavery	3392	Square Miles
Kurnool	5767	Do.

The extent surveyed by the party since its organization up to 31st December 1872 is, as will be seen from the margin,

9159 square miles.

HISTORY OF No 3 PARTY

SCALE, SAME AS THAT OF No. 1 PARTY

31. The nucleus of a third party was handed over by the Superintendent to Captain PRATT in April 1859. Augmented by drafts of men from the senior parties, it commenced survey operations in the late Masulipatam (now Kistna) District, but the party was not raised to its full strength till the September following.

32. The survey of 6378 square miles of country in the 11 talooks composing the District was completed by the close of 1864. The delineation in village maps of topographical details in some of the talooks first entered on was found very meagre, and was therefore supplemented by a plane table survey on a scale of 2 inches = 1 mile for the construction

of talook maps. Similar neglect has not since then occurred.

33. By the Cyclone of the 1st November 1864, maps of 171 villages completed and in different stages of preparation, also Survey and Demarcation records, were either destroyed or materially injured at Guntoor. The retention of the Head Quarters of the party in the Masulipatam District for some time was therefore found necessary. The measurement of 60 square miles of additional cultivation in fields was performed simultaneously with the restoration of the destroyed records.

34. In 1865, a detachment from the party (No. 3) commenced work in the Cuddaph District under Mr. J Tomlinson, who remained in charge till relieved by Colonel Crewe in April. The total extent surveyed by the party up to December 1872 is 9262 square miles.

Kistna	6378	Square miles
Cuddapah	2884	Do.

35. The fourth party was organized by drafts of men from No. 1 yarty. The work on which it was engaged at first was of a special nature, because Wynaad (where the working season is limited to 5 months in the year) presents many formidable obstacles. Great difficulty was experienced in inducing men to take service in Wynaad, and much time was lost in moving the party there and back, till its final transfer to the Tinnevelly District, agreeably to G.O. No. 895 of 25th April 1862. Tenkasy talook was first handed over for survey by the Settlement Department, and survey operations were extended gradually to the other talooks. Extremely defective demarcation and other circumstances delayed the progress of the survey which, however, has now completed the District with the exception of a hilly tract to the N. West, a long standing dispute concerning the boundary between Tinnevelly & Travancore territory having hitherto prevented its demarcation. Marginally is given the extent surveyed by the party up to the end of 1872, exclusive of what was performed in the Salem and Coimbatore Districts noted under another head.

Wynaad	191	Square Miles.
Tinnevelly	4560	Do.
Madura	90	Do.

36. The auxiliary party, sanctioned for the Godavery District in G.O. of the 28th December 1859, and referred to in Para 28, was transferred to Nellore, and augmented by large drafts of men from No. 1 & 3 parties. This formed a fifth party, & commenced the Revenue Survey of the District in March 1861 under Mr. Puckle. The Nellore talook was not at first demarcated with stone, consequently a great many marks disappeared & much difficulty was experienced in making corrections. The survey of waste lands & unsettled boundary disputes prolonged the completion of the field & boundary work to 1866. At the close of that year, a small party of Surveyors was sent to the Madras (now Chingleput) District, in which the Demarcation is performed by the Revenue Survey Department, under Orders of Government, dated 12th December 1864, No. 2243.

37. On the transfer of the Head Quarters to the Chingleput District, a detachment remained to finish arrears of work and to carry on the demarcation and Survey of Zemindary tracts and of Hill ranges excluded from demarcation. The line dividing Nellore from Kurnool and Kistna has been demarcated by the Survey, the Settlement Department having declined to undertake the duty. The long delay in settling and defining the boundary line between this District and Cuddapah has hitherto stood in the way of the completion of the District map of Nellore.

38. The non-settlement of the boundary between the Trivellore talook and the adjoining zemindary tracts retarded the progress of survey in the Chingleput District; but the demarcation being good, the survey of five out of six talooks taken in hand has been completed, and area lists for all the villages in four talooks have been lodged in the Central Survey Office for Settlement purposes. The extent of country surveyed is given in the margin.

Nellore	3462	Square Miles
Chingleput	2834	Do.
North Arcot	110	Do.

39. At the desire of the Court of Wards, who were anxious that an accurate Revenue record should be made of the Purla Kimedy estate (in Ganjam, which was and is still under Wardship), the Superintendent in 1863 organized a small party for the survey of the zemindary, which he placed under Lieutt. Wynch. It was at first intended that the Manager of the estate should perform the necessary demarcation, but after a short time, it was found necessary to have an establishment trained by the survey during one year. The charge of it then reverted to the Revenue Officers. The Survey of the estate comprising 544 square miles came to a close during the Superintendent's absence on sick leave in 1866, and the Establishment served to form the nucleus of the 6th and last Survey Party, organized in Ganjam in September 1866, of half the usual strength, in compliance with G. O. No. 2054 of 31st August 1865. Up to date, it has surveyed 824 square miles, and completed the Chicacole talook.

40. A detailed survey of all land held within the limits of the District of the Town of Madras on a large scale, with Divisional and Key maps on reduced scales, was ordered by Government in March 1854. The Establishment originally sanctioned was increased to double its strength in 1856. The work was at first under the control of the Collector of the District, and was intended to be professionally examined from time to time by the Executive Engineer Officer at the Presidency.

41. In 1859, on the Superintendent's return to Madras after having organized the Northern Survey parties, the Madras Town Survey was handed over to him, and at his request, a small Establishment was given him for the purpose of testing the work up to that time performed, the Engineer Officer having found it impossible to spare time from his other duties to examine it while in progress.

HISTORY OF No 4 PARTY PRESENT

Scale, same as that of No. 1 Party

HISTORY OF No 5 PARTY

Scale, same as that of No. 1 Party

HISTORY OF No. 6 PARTY

Scale of Establishment for Purla Kimedy

		Rs.	As.	P.
1	Assistant Superintendent	450	0	0
1	Sub Assistant	150	0	0
13	Surveyors	650	0	0
20	Amins &c	230	0	0
88	Measuring Peons &c	452	0	0
13	Computers & Draughtsmen	400	0	0
	Total	2,332	0	0

Scale of No. 6 Party.

		Rs.	As.	P.
1	Military Assistant	681	10	0
1	Sub-Assistant	150	0	0
5	Head Surveyors from Rs. 50 to 100 Rs	380	0	0
10	Deputy Surveyors from Rs. 25 to 50 Rs	340	0	0
10	Detail Surveyors from Rs. 17½ to 25 Rs	200	0	0
30	Ameens from Rs. 10 to 14 Rs.	360	0	0
30	Gumastahs from Rs. 8 to 10 Rs.	270	0	0
1	Manager	75	0	0
7	Writers & Computers	165	0	0
11	Draughtsmen	270	0	0
1	Duffadar	10	0	0
55	Measuring Peons &c	340	0	0
	Measurement Allowance	384	6	8
	Measurers	288	8	8
	Coolies	187	8	0
	Contingencies	100	0	0
	Total	4,202	1	4

Madras Town Survey
Scale of Establishment.

2	Revenue Surveyors	@	175	each	350
2	Assistants do.	@	50	„	100
2	Writers	@	20	„	40
2	Tindals	@	7	„	14
4	Chainmen	@	5½	„	22
2	Instrument bearers		5½	„	11
2	Offset men		5	„	10
4	Flagmen		5	„	20
2	Lascars		6	„	12
	Total				579

Test Survey

1	Head Surveyor	50
2	Computers	35
1	Draughtsman	30
6	Measurers	37
	Total	152

42. Up to the date of this transfer, 16½ square miles, containing 13277 holdings (about 800 to the square mile), had been completed in the divisions marginally noted at a cost of Rs. 35,629 or Rs. 2160 per square mile, or Rs. 2-10-11 per holding.

Mylapoor.....
Nungumbakam.....
Triplicane..... ....
Egmore.....

43. The result of the examination of former work by the Superintendent was satisfactory, few errors were discovered, and of these not many exceeding 5 per cent.

44. The Town survey was finally closed in 1863, an additional area of 10 square miles, containing 14976 holdings (about 1500 to the square mile), having been measured & mapped for Rs. 21,255 or 2125 per square mile or Rs. 1-6-3 per holding in the divisions named in the margin.

Black Town (2 Divisions)
Perambore ... .
Tondiarpet ....

45. The great difference between the average content of holdings surveyed under the Collector and those by the Establishment under the Superintendent arises from the latter having been employed in Black Town, where the land is chiefly covered by native houses and back-yards averaging 0·08 acre in extent.

46. The maps were lithographed after survey for Revenue, Municipal, Engineering and other Government purposes. A combined map on a reduced scale, shewing the Municipal divisions, has been compiled and lithographed in the Survey Office to aid the Census Commissioners and the Engineers engaged on the Madras Water Works. To some extent, a demand exists for Divisional and Key maps, and for extracts shewing particular holdings.

47. In para 22, the circumstances connected with the undertaking of the survey of the Wynaad taluk have been mentioned. Both the survey and demarcation operations were carried on during the working seasons of 1860*, 61 & 62† and a small detachment was sent early in 1863 to complete unfinished surveys. Meanwhile, from a consideration of the expense, Government resolved to reduce the Establishment, merely to carry out the survey of Government land and private estates (the latter on payment), and to ascertain from time to time, the taxable cultivated area. For this purpose, an Establishment at a monthly cost of about Rs. 1000 was placed under the Collector of Malabar. This system with some modification was continued till the end of 1866, when, being found unsatisfactory, the survey was again handed over to the Superintendent, and arrangements were made for employing the surveyors, who were at the time under Captain SARGEAUNT on the Neilgherry Hills, when work could not be carried on in Wynaad. The Demarcation performed by the Revenue Department being found defective, the performance of the duty was also handed over to the Survey Department, and an efficient Establishment for both Demarcation and survey was sanctioned in G. O. No. 1225, and has since then continued to work under Captain

* Under Captain Searle
† Under Captain Barber

10th August 1870.

SPECIAL SURVEY
WYNAAD

DEMARCATION

		Rs.
2	Head Gumastahs.....@ Rs. 60 each	120
20	Demarcation Gumastahs @ 30 each	600
2	Office Gumastahs,... Rs. 30 each	60
25	Peons Rs. 7 each...	175
	Batta	284
	Stone allowance	100
	For one month...	1339
	For five months.....	6695

SURVEY

		Rs.
1	Assistant Superintendent... ...	750
	Batta Rs. 5 per diem... ...	150
2	Sub-Assistant Rs. 250 & 200.	450
10	Surveyors Rs. 130 each... ...	1,300
103	Peons & Measurers	760
3	Writers & Gumastahs...	100
	Batta...	755
	Station allowance	100
	For one month...	4,365
	For five months...	21,825
	Cost of Demarcation...	6695
	Total...	28,520
	Contingencies...	1500
	Grand Total...	30,020

150

SARGEAUNT on the Neilgherries, in Wynaad and in Nellumboor (a part of the Malabar District) according to the season.

NEILGHERRY HILLS

48. In 1866, Government directed that a systematic detailed survey on a large scale should be made of the three Settlements (Ootacamund, Coonoor and Kotergherry) and also of outlying Estates, Waste land blocks, Government reserves &c. Till then, surveyors had been merely detached as required for the survey of Waste land blocks on the Hills. No Officer being at first available, MR. STARR the Senior Central Office Assistant directed the work of demarcation and survey till relieved by Lieutnant FREETH R. A. of the Coorg Survey during the S. W. monsoon when work was impracticable on the West Coast. After his departure, MR. STARR was again put in charge. On the return of the Superintendent from leave at the end of 1866, he placed the control of the detachment of No. 1 party employed on the Hills and in Wynaad, in the hands of Major HESSEY the Deputy Superintendent of the party. It has been successively in executive charge of Sub-Assistant MR. FRASER, Lieutnant CLERK (Coorg Survey) for a few months, and Captain SARGEAUNT for 4 years in all.

NELLUMBOOR

49. Early in 1870, a surveyor from the Wynaad and Neilgherry detachment was despatched to the Nellumboor Valley in Malabar to commence the survey of the Teak plantations and Government forests. The Demarcation was at first undertaken by the Forest Superintendent. It was after a short time, considered expedient that the Survey Department should also perform this duty.

50. During each subsequent working season from one to four surveyors have been thus employed. The extreme unhealthiness and remoteness of the locality, the want of labour which had to be imported, and the short working season tended to render this survey both tedious and expensive. However, as ascertained from personal inspection by the Superintendent, it has been thoroughly and satisfactorily performed.

SHERVAROY HILLS

51. The Survey of the Salem District did not at first embrace that of the Shervaroy Hills, but in 1861, when work was stopped by the S.W. Monsoon in Wynaad, some of the Surveyors engaged there were transferred under an Assistant Superintendent to these Hills for employment till the season permitted of work being resumed in Wynaad. The climate being unsuited to natives of the plains, the demarcation, defective, and the Survey Assistant having neglected his instructions, but slow progress was at first made. During each successive hot season for three years, a detachment from the Salem party was thus employed. Besides maps of Coffee estates and of the area under cultivation by the Mallialies, (Hill men) a general map of the whole plateau was provided.

52. The assessment was revised in 1864 by the Collector of the District the Honorable D. Arbuthnot, and satisfactorily settled on the survey data.

PONACHY HILLS

53. The demarcation and survey of 19 properties on the Annamallay Hills of which 8 are Coffee plantations were performed in 1869 on the requisition of the Collector of the Coimbatore District.

71. This party was started in 1867 in charge of Captain Baynes, 91st Foot, 1st Assistant Superintendent, in order to complete the Darapuram Talook, Coimbatore District, of which one half had been demarcated by the Settlement Department.

72. It has since then taken up the Caroor, Polachy and Oodimallycottah Talooks of the same District and the Mootahs in that of Salem. It has also renewed the demarcation of the Coimbatore and Pulladum Talooks of Coimbatore, besides demarcating some villages of the latter talook originally excluded by the Settlement Department.

73. The talooks of Polachy and Oodimullycottah have been successfully undertaken on the system of combined demarcation and survey by which the Demarcation Establishment is merged into No. 1 Survey.

74. The party has proved useful in furnishing drafts of trained men to other Districts.

75. From the first, field stones have been supplied by a contractor to ryots on payment at a fixed rate.

76. Land in this District being held in larger blocks than in most others, it has been found possible to deal with each individual holding without unduly swelling expenditure. The ryots have invariably evinced good will and have cheerfully afforded assistance.

77. Into Madura, demarcation and survey have been introduced together, both processes proceeding pari passu.

78. Preliminary enquiries and arrangements for the supply of Demarcation material having been made the previous year, a small combined party under Captain Thompson R. A. Assistant Superintendent, composed of detachments from Tinnevelly & Coimbatore was, by desire of the Board of Revenue, despatched in 1871 to the Cumbum Valley to commence work in the Periakolam Talook. The locality being feverish, the working season only commences in July and lasts till the advent of the N.E. monsoon at the beginning of November. The work thus initiated has been extended to the rest of the talook where the season for work is not so limited.

79. The Revenue Survey of the Tinnevelly District having as stated in Para 35, been brought to a close, the Establish ment of No. 4 party under the Deputy Superintendent Captain Cloete is being transferred to the Madura District.

80. At first, it was found necessary for Government to furnish stones by importing and engaging stone-cutters; but Captain Cloete now reports that the villagers at present undertake to supply their own field marks and also those required by Government on payment, as is done in Chingleput and North Arcot.

81. In compliance with the orders of the Court of Wards, orders have been issued to commence the detailed demarcation and survey of the Bodinaiknur Zemindary which forms part of the Periakolam Talook.

82. In Bellary, with the concurrence of the Collector, it was decided to take up the Adoni talook for demarcation and survey as men could be transferred from No. 2 Survey party on the completion

HISTORY OF No. 3 COIMBATORE DEMARCATION PARTY

Scale same as that of No 1 Demarcation Party.

Demarcated in all 3072 Square Miles.

HISTORY OF No. 4 MADURA DEMARCATION PARTY

HISTORY OF No. 5 BELLARY DEMARCATION PARTY

of the Revenue Survey of the Kurnool District.

83. Mr. Merriman, Assistant Superintendent, was transferred to Coimbatore for three months, for instruction in Demarcation, and has been placed in charge of both demarcation and survey on the combined system in Adoni.

84. Endeavours to introduce the system found so advantageous in the Chingleput and North Arcot Districts for the supply of all Demarcation stones through the ryots, have been successful.

LITHOGRAPHIC ESTABLISHMENT

Scale of Lithographic Establisment.

		Rs.	As.	P.
1	Head Draughtsman...	90	0	0
12	Draughtsmen...	375	0	0
8	Tracers...	85	0	0
1	Lithographic Writer...	20	0	0
4	Printers...	60	0	0
14	Pressmen Inkmen &c... ...	80	0	0
2	Mutchies...	20	0	0
3	Peons...	17	0	0
1	Sweeper...	4	0	0
	Total...	751	0	0

85. In February 1858, sanction was accorded by the Government of India, for the formation of a Lithographic Establishment at a monthly cost of Rs. 751. A commencement was made in that year; but the operations were confined to mere preliminaries, as the Superintendent, being engaged in organising the two Northern parties, was frequently on the move and carried with him his Office and the 8 or 10 men who composed the Lithographic Establishment. He was thus unable, till the beginning of 1860, to establish his Central Office at Madras with which the Lithographic Establishment was to be connected in order that the responsibility for the correctness of the work might be borne by the Revenue Survey Department from beginning to end. Previous to the organization of the Lithographic Department under his orders, maps of 16 villages were lithographed by the Lithographic Establishment belonging to the Department of Public works.

86. On the 1st January of the following year, the Establishment consisted of the persons noted in the margin and worked three presses. Much difficulty was experienced in obtaining the services of competent men.

Head Lithographer.....	1
Draughtsmen...	10
Tracers.....	6
Writer.....	1
Printers.....	3
Pressmen &c.....	13
Mutchies.....	2
Peons.....	2

87. Village maps were at first printed in colours to shew the different tenures and descriptions of land. In 1862, symbols were substituted for colours, and again in 1866, these symbols were altogether omitted and a ribbon of colour introduced. Vide Paras from 91 to 93.

REVISED SCALE OF LITHOGRAPHIC ESTABLISHMENT

		Rs.	As.	P.
1	Head Draughtsman...	150	0	0
8	Draughtsmen...	290	0	0
5	Examiners...	160	0	0
15	Tracers...	200	0	0
8	Typers...	60	0	0
2	Map Record-keepers... ...	55	0	0
1	Store-keeper...	40	0	0
1	Lithographic Writer	20	0	0
7	Printers...	87	0	0
33	Pressmen Inkmen &c... ...	210	0	0
31	Mutchies...	202	0	0
3	Peons...	21	0	0
1	Sweeper	5	0	0
	Total...	1500	0	0

88. In 1867, a proposal by the Superintendent Revenue Survey to raise the Establishment to double its original strength was sanctioned, in order that it might keep pace with the Survey Establishments in the field which had been nearly trebled since the date of the original sanction of the Lithographic Establishment.

89. Up to December 1872, maps of 13,562 villages and estates have been printed, making in all a total of 456137 copies. Twenty eight talook maps, 100 copies each, have also been lithographed besides those of Coonoor and Ootacamund Settlements and of the Wellington and Trichinopoly Cantonments. A very large amount of miscellaneous work has also been

54. Previous to the sanction of the revised estimates in 1858, there had been no special demarcation at all. The value of the work that had been done was much lessened by the difficulty in recovering the limits of such fields as had no natural boundaries. Under the new scheme, not only were the boundaries of villages to be demarcated, but also every field having a number in the Survey accounts was to be marked out so as to be easily recognisable at any future period. As mentioned in para 20, this duty was undertaken by the Settlement Department.(1858.)

55. In the South Arcot District & in Trichinopoly, there was a considerable extent of country already surveyed which required to be demarcated and settled. The Department had also to demarcate in advance of the Survey. The Torriore Talook (now Moosery) was taken up for the purpose, whilst the Survey continued at work on the old system in the Volkondapuram (now Perambalore) Talook.

56. Subsequently, the Salem, Kistna, Nellore, Kurnool, Cuddapah, Coimbatore, and Tinnevelly Districts and the Wynaad Talook, Malabar District, were taken up for demarcation by the Settlement Department. Of the above, some have been completed, others are in progress, and others again have been abandoned by the Settlement Department.

57. The demarcation was, from the first, found unsuited to survey requirements, but it was not till 1860, that the Superintendent advocated its being handed over to the Survey. This proposal was opposed by the Director Revenue Settlement, but circumstances, at last induced the Government to consent to the change.

58. In the year 1864, it was resolved by Government that the work of demarcation should be performed by the Survey. In 1866, Demarcation was commenced by the Survey on fixed principles in the Madras District (now Chingleput), in Ganjam, and a year after, in Coimbatore.

G. O. 12th December 1864 No. 2243 para 26. The Government resolve therefore that in all Districts hereafter taken up, the demarcation shall be performed by the Survey Department.

59. The first Demarcation party under the Survey Department was set on foot in 1866, men having been transferred from the Settlement Department for the purpose and placed under the orders of Lieutenant Cloete, 1st Assistant Superintendent Revenue Survey. Work was commenced in the Sydapet Talook, an unfortunate choice of locality as it turned out, the land being chiefly owned by wealthy and litigious non-resident landlords and the occupants a needy class frequently paying excessive rents. Material for demarcation marks was not easily procurable, the quarries being inconveniently situated and stone-cutters few in number and exorbitant in their demands. A revision of the Demarcation rules was made and men entertained and specially trained for performing Demarcation according to fixed rules.

60. As was anticipated, progress was for some time, slow and the cost high. The work however was good, permanent and suited to both survey and settlement requirements.

61. The party has successively taken up the Sydapet, Trivellore, Ponairy, Conjeveram, Chingleput

HISTORY OF No. 1 CHINGLEPUT DEMARCATION PARTY
SCALE

	Rs.	As.	P.
1 Military Assistant Suptt. 350 Travelling allowance.....75	425	0	0
1 Uncd. 2nd Asstt. Suptt. 250 Travelling allowance 75	325	0	0
Regimental allowance of a Lieutenant on Staff Corps..	256	10	0
2 Inspectors	250	0	0
2 Deputy Do.	90	0	0
4 Office Gumts. from Rs. 12 to 15	54	0	0
17 Head Gumts. from Rs. 20 to 30	400	0	0
52 Gumastahs from Rs. 12 to 15	714	0	0
1 Dufladar or Head Peon.....	10	0	0
100 Peons from Rs. 6 to 8.....	612	0	0
3 Moochies from Rs. 7 to 9.....	23	0	0
1 Sweeper...	5	0	0
Contingencies...	100	0	0
Boundary pillars.....	833	5	4
1 Dresser...	24	8	0
Office accommodation (on average).....	60	13	4
Total...	4183	4	8

and Madurantakum Talooks which compose the Chingleput District and is now working as part of No. 5 Survey party in the Arcot and Wallajah talooks of North Arcot District.

62. The combined system of demarcation and survey was adopted in the Chingleput talook and has been continued with satisfactory results in those subsequently entered on.

63. Demarcation was retarded by the causes affecting the progress of survey noted in Para 38. The non-attendance and the delay in erecting field marks by villagers were for sometime found serious obstacles and it was deemed expedient to demarcate under the provisions of Sec. VII of Act XXVIII of 1860, Government providing and erecting marks in the first instance and recovering the cost from the owner or occupant. This necessarily expensive system has however been entirely got rid of; thanks to the good will and co-operation of the ryots who, at present, not only provide field stones but also on payment those required by Government.

64. The total area demarcated by this party is 4733 square miles.

HISTORY OF No. 2 GANJAM DEMARCATION PARTY
SCALE

	Rs.	As.	P.
1 2nd Assistant Superintendent	325	0	0
1 Inspector...	100	0	0
1 Deputy Inspector...	40	0	0
2 Office Gumastahs from Rs. 12 to 15...	27	0	0
5 Head Gumastahs from Rs. 20 to 25...	110	0	0
25 Demarcation Gumastahs from Rs. 12 to 15... ...	336	0	0
33 Peons from Rs. 6 to 7..... ...	199	0	0
Contingencies...	50	0	0
Average cost of erecting boundary pillars..... ...	416	13	4
Office accommodation (on average)...	60	10	8
Total...	1664	8	0

65. No. 2 Demarcation party was organized under Mr. Carnozo 1st Assistant Superintendent in August 1866, the four previous months having been occupied in training men and collecting materials. Like No. 6 Survey Establishment to which it was attached, its strength was only half that of a full Demarcation party. Chicacole Talook, Ganjam District, was the locality selected by the advice of the Collector as that in which work should commence.

66. In this talook, a contractor was employed to provide stones of the approved patterns and duly marked. From him, the ryots purchased field stones at a fixed very low rate.

67. On moving to the Berhampore Talook, at the recommendation of the Officer in charge, recourse was had to Section VII in order to accelerate progress. It was however found practicable to revert to the original arrangement for supplying field stones in the villages of the Berhampore Talook last taken up and in those composing the Goomsoor Talook, at the same time introducing the combined system by which No. 2 Demarcation party works conjointly with No. 6 Survey.

68. The ryots in Ganjam evinced so decided a desire to have each individual holding separately demarcated and surveyed that it was considered advisable for the purpose of gaining their co-operation, to carry out their wishes. Demarcation marks were obtainable at such low rates that it was hoped no material increase of cost would result in the only three talooks belonging to Government.

69. It has however been found that the minute subdivisions of land cannot be thus dealt with except at a greatly increased expenditure of time and money. Orders have therefore been issued to combine several holdings into one Survey field where land is not exceptionally valuable.

70. The party has in all demarcated 843 square miles.

performed. The value of maps lithographed is, approximately estimated, Rs. 259,360-0-0 as shewn below :—

		Rs.	As.	P.
Village	Maps	185,800	0	0
Talook	do.	12000	0	0
District	do.	3850	0	0
Estate	do.	31470	0	0
Skeleton	do.	1940	0	0
Town Survey	do.	6200	0	0
Miscellaneous	do.	10300.	0	0
Forms	do.	7800	0	0
Total Rs.		259,360	0	0

90. The duties of the Central Office are chiefly those of check and control. The preparation of topographical maps is also performed by the draughtsmen on its Establishment. In 1867, it was augmented simultaneously with the increase to the Lithographic Establishment. When Demarcation was handed over to the Survey, a small Office Establishment was attached to the Central Office.

Scale				
1	Head Assistant	250	0	0
Accounts Audit and Correspondence.				
1	Office Assistant	150	0	0
2	Clerks	50	0	0
1	Record-keeper	50	0	0
1	Cash-keeper and Accountant.	40	0	0
2	Examiners	70	0	0
1	Despatching Clerk	15	0	0
1	Mutchi	7	8	0
Records and Computations.				
1	Manager	100	0	0
2	Computers	60	0	0
1	Examiner	30	0	0
1	Record Gumastah	12	0	0
Drawing Department.				
7	Draughtsmen & Examiners...	270	0	0
1	Map Record Gumastah ...	12	0	0
1	Mutchi	7	8	0
Servants.				
1	Duffadaror Head peon ...	14	0	0
7	Peons...	50	0	0
Demarcation Deparment.				
2	Examiners...	120	0	0
1	Translator...	50	0	0
1	Clerk...	30	0	0
1	Record-keeper... ...	20	0	0
1	Mutchi...	7	0	0
3	Peons...	21	0	0
	Total...	1436	0	0

CHANGES INTRODUCED FROM TIME TO TIME IN MEASUREMENT, PLOTTING, COMPUTATION, AND MODE OF RECORDING.

91. In the original village maps, the different tenures and descriptions of cultivated and fallow land were shewn by appropriate colours and an exact counterpart of the manuscript maps was produced in colours by the Lithographic Press. To effect this, a large number of lithographic stones were necessary and the process altogether was found tedious and costly. To remedy this difficulty, symbols were, at the beginning of 1862, substituted for colours to distinguish cultivation and tenure.

METHOD OF RECORDING TOPOGRAPHICAL DETAILS

92. The information for this purpose was obtained from the village accounts and was found frequently to differ from the actual state of the ground, land termed irrigated being discovered to bear dry crops, the source of irrigation having been destroyed by time, neglect or floods, and vice versa, land under luxuriant wet crops being entered in the unirrigated column, the water from which it derived its irriga-

tion being brought from some private source. In like manner, waste land had been brought under cultivation and cultivated land had been abandened.

93. It was therefore determined in 1865 to omit the symbols, but in order to have data wherewith to construct topographical maps, the limit of every existing block of wet or dry cultivation was distinguished in the village map by a particular ribbon of colour.

CHANGE IN THE COMPUTATION OF FIELD AREAS

94. The Superintendent had always felt that the weak point in the Madras system of survey was the mode of computing field areas. The multiplication of the mean length by the mean breadth answered as long as only applied to taks (plots) of tolerably regular shape, and to these, this method had always been restricted. The content of irregular taks (plots) was obtained geometrically from the map and that of offsets was computed in like manner.

95 In 1862, the computing scale was introduced as an experiment and used to ascertain the content of irregularly shaped taks (plots) and fields. It was found to give such accurate results and to diminish labour so materially that, in 1864, the Superintedent directed that it should be generally adopted in supersession of the Khusreh or rougher method of computation described above.

96. To guard against the introduction of error, each computation is twice made independently. Where a difference between these two computations of more than acres 0·05 acres in a field of less extent than 10 acres exists, it is again computed by a third person & the mean of the two nearest areas adopted. Above 10 acres, 0·1 acre is the limit of difference permitted.

97. Very soon after commencing the tentative survey in South Arcot during 1853, the Officer in charge discovered that some additional check was required in field measurement to ensure accuracy and to point out the locality in which faulty measurement of the sides of taks (plots) had been made. The Ameens were therefore directed to measure the diagonal of each tak (plot) in addition to the four sides, & evasion of this order was severely punished. The inspecting Surveyors were desired specially to examine fields of which the diagonal was omitted, and except the existence of a physical impossibility, no excuse was accepted. Subsequently, to meet the case of error in the measurement of a diagonal itself the experiment was made of instructing Ameens to note the length of *both* diagonals, one of which was certain to be correctly entered.

CHANGES IN RECORDING MEASUREMENTS

98. Carrying out these instructions practically amounted to surveying by triangles and in 1866, this process was formally ordered. It permitted the field Surveyor to lay out a field in triangles in the manner most convenient for measurement, irrespective of quadrilateral taks (plots) at first followed. This in no way affected the method of plotting, whilst it secured increased accuracy and facilitated the discovery of the exact position in which an error in measurement had been made.

99. The field-book in use by the tentative Survey Establishment in South Arcot included all the necessary Revenue details of each field measured. On the Settlement Department being set on foot, it was considered part of their duty as demarcators to

record information of this description which was accordingly omitted from the Survey field-book. It was apparently deemed advisable to confine the Survey Establishment strictly to its own special work; for an offer made by the Officer in charge to record observations of the temperature, atmosphere and rain-fall, if provided with the necessary appliances, was declined. Rain guages were, however, afterwards supplied, but no trustworthy record has been kept. Again it was proposed to collect statistical information for each village, the Revenue authorities, however, were of opinion that other and more suitable means of collecting this information were available.

100. From the very beginning, the Ameens had prepared an eye-sketch in which not only every field but every tak (plot) into which the field had been cut up for measurement was shewn and also the measured length of the sides of each tak (plot).

101. Early in 1863, the heading of the Ameen's field-book was again modified, three columns containing information regarding tenure, cultivation and topographical items being omitted. The first two of the omitted columns were included in the Land Register compiled by the Demarcation Department. A list of topographical details noting the fields in which they were situated was kept by the Detail Surveyors.

102. In September 1869, the Superintendent altogether did away with Ameen's field-books. It was found that no amount of supervision and inspection nor any penalty however severe, was sufficient to prevent the Ameens from recording all their measurements in the field on the sketch alone and transcribing them on their return to their houses, into the field-book which thus ceased to be an original record.

103. The Ameens's sketches had hitherto been made on common country brown paper mounted on coarse cloth. It was now determined that these sketches should be carefully drawn on good paper, to be well mounted on cloth as soon as received from the field and that these sketches should be the only record which Ameens were required to prepare on the ground.

104. From these sketches, on the survey and measurement of the village being plotted, a record was compiled, one field to each page with every measurement duly inserted.

105. It was found after a year's trial that provision was required for recording certain information; the Superintendent therefore directed that in addition to the eye-sketch, every Ameen should be furnished with a note-book on each page of which columns were provided for entering deductions, missing stones, unmeasured numbers, topographical items, signature of village officials, and Demarcation discrepancies &c.

106. In the same year, the general eye-sketch was superseded by devoting one page of the note-book to a sketch of a block of numbers, the opposite page containing the detailed information for the fields shown in the sketch. At the recommendation of a committee of officers, held in the beginning of 1871, and on the introduction of the combined system of demarcation and survey, a large book was introduced on each page of which the measurements and

ORIGINAL HEADING.

1863.

No. of field & commencement of measurement.	Sides. North & South.	Sides. East & West.	Diagonal.	Area. Acres.	Area. Dec.	Remarks.

1858.

No. of field & commencement of measurement.	Sides. North & South.	Sides. East & West.	Diagonal.	Boundaries. North.	Boundaries. South.	Boundaries. East.	Boundaries. West.	Area. Acres.	Area. Dec.	Trees, Buildings &c.	Wet or Dry.	Govt. or Inam.	Remarks.

No. of Field & commencement of measurement.	Measurement of Sides & area of field.	Crop	Boundaries. North.	Boundaries. South.	Boundaries. East.	Boundaries. West.	Remarks.

Pattadar's name & Trees, Buildings &c.	Soil.	Wet or Dry.

shape of one or more numbers are entered and at the end of the book the detailed information formerly given in the note-book is recorded.

TOPOGRAPHICAL DETAILS

107. On the completion of the field plotting, Topographical details in village maps are drawn in the maps by the Detail Surveyors on the ground. With the map in his hand on which each field is delineated, a man with very moderate abilities and pay is quite competent to perform this duty. Waste tracts included within the village boundary are surveyed in the regular manner.

108. For inserting details within the village boundary, there is no question but that the present system is preferable to the plan of having special topographical surveys made on the 4 inch or any smaller scale. The question of accuracy must be settled by the scale at present in use being 16 inches to a mile and the fact that every field is visited. As above mentioned, the present system admits of the employment of men on small pay while to Plane Table Surveyors high pay must be given to secure the services of trustworthy and efficient men. The check, afforded by the boundary of each field being laid down beforehand and being of necessity visited by the person employed in detailing, cannot possibly be surpassed; whereas in Plane Table Surveying, except inspection and going over a portion of the ground again, there are no means of testing the accuracy of the work.

109. It has not yet been satisfactorily determined whether accuracy and cheapness are on the side of Plane Table Surveying or of surveying with Chain and Compass for merely topographical purposes. For the 4 in. = 1 mile scale, perhaps the latter has the advantage; on any smaller scale, the Plane Table is on the whole to be preferred. In hilly countries of course, the Plane Table must necessarily be used.

MINIMUM CONTENT OF FIELDS RECORDED

110. There can be no doubt that, if feasible, the measurement of every separate plot of ground held on puttah should be undertaken and its position shewn in the village map. In many districts, however, this it has been found impossible in practice. The number and minute size of holdings render their measurement enormously expensive and if generally carried out, would necessitate an increase to the scale on which village maps are drawn. In one block of 50 acres for instance, the land was divided into 511 plots averaging rather less than 0·1 acre. At present, when a village subdivision is found to contain a large number of exceptionally small fields, it is plotted on the 32 inch scale and then reduced by Pentagraph into its proper place in the village map.

111. The limit of 4 acres in dry and 2 in wet land originally assigned to Survey fields has always been preserved in wet land and till this year in dry. In order to expedite the operations of Survey, permission has been lately granted to club fields in poor unirrigated land upto 12 acres under certain conditions. This will doubtless save time. Fields included within survey-fields are, where they exist, measured by the Settlement Department after Survey operations have been closed.

INTERSTITIAL FIELDS

112. In all the Districts first taken up for Survey, the measurement of Interstitial fields (*i. e.* of fields contained within the Survey fields of 2 acres in irrigated and 4 in unirrigated land) was performed by the Survey Department.

113. On receipt of orders from Government early in 1862, however, the measurement of these minor fields was discontinned.

114. In 1864, Government desired that the Survey should record the length of the sides of Minor fields coincident with those of Survey fields and sketch in by eye the unmeasured sides.

115. The execution of this latter order was found to entail an expense altogether out of proportion to the results attained. The measurements and sketching of these Minor fields not being verified by plotting, sufficient guarantee of their accuracy was not to be obtained to satisfy Survey requirements. On the representation of the Superintendent therefore, Government in 1872, decided to omit the partial measurement and sketching ordered in 1864.

116. The Department being relieved of the measurement of Minor fields is a great boon. It will now take cognizance of Survey fields alone. The measurement by the superior and costly agency of the professional survey, of fields varying from 1 acre to the minutest fraction of an acre swelled the cost of survey operations considerably, and, with the imposition of charges not originally contemplated and other circumstances beyond its control, has been the cause of the estimates having been so much exceeded.

EXCESS DISCOVERED BY THE SURVEY.

117. In reply to a call from the Board of Revenue in 1870, the Superintendent supplied what information he possessed on the subject of the credit due to the survey in bringing to account unassessed areas. At that time, it was shewn that taking 2 Rs. per acre as the average assessment of land in the Madras Presidency, an annual increase from this cause had accrued to the assessed area, of the same amount as had up to that date been expended on survey operations.

118. The expenditure had been about Rs. 40,00,000, and the increase discovered by survey of the assessed area was 20,00,000 acres or a little over 3000 square miles, the mean per centage of increase being 14.

PRESENT OPERATIONS.

COIMBATORE AND SALEM

119. No. 1 Party is at present engaged on the combined demarcation and survey of the Polachy talook and on the demarcation and survey of Mootahs in Salem excluded from operations by the Settlement Department. Colonel HESSEY Deputy Superintendent Revenue Survey is in charge of the party.

KURNOOL AMD BELLARY

120. The Revenue Survey of the Kurnool District having come to a close, surveyors have been, for some time past and are still, employed on the District and Talook boundary lines and on a topographical survey of tracts excluded from demarcation. The rest of the field establishment has entered on the Adoni Talook of the Bellary District, the simultaneous demarcation and survey of which is to be

CUDDAPAH

performed on the combined system under the orders of Mr. H. O. C. CARDOZO, Deputy Superintendent Revenue Survey.

121, No. 3 Party is still employed in the Cuddapah District under Mr. F. C. PUCKLE. The village boundary survey and field measurement in 6 out of 11 talooks in the District have been brought to a close, but no talook has been returned as complete, talook boundaries being left undefined, patches of cultivation originally not demarcated being taken in hand, and changes requiring re-measurements being introduced by the Settlement Department.

TINNEVELLY AND MADURA

122. Work has been commenced on the combined system in the Madura District, and except some topographical surveyors employed in Zemindaries in Tinnevelly, the demarcation of which was undertaken by the survey, the field establishment has been transferred to the Periakolum Talook of Madura, under the orders of Captain J. G. CLERK, Deputy Superintendent Revenue Survey.

NELLORE CHINGLEPUT AND NORTH ARCOT

123. The Revenue Survey of the Chingleput District being on the eve of completion, the Arcot talook of the adjoining District, North Arcot, was undertaken on the combined system of demarcation and survey early in 1872, under the orders of Mr. W. BEAUMONT, Deputy Superintendent Revenue Survey.

GANJAM

124. The Survey of the Berhampore Talook is nearly closed, and simultaneous demarcation and survey in Goomsoor has commenced under Captain C. D. BAYNES, 1st Assistant Superintendent Revenue Survey.

Revenue Survey office
Chepauk
4th June 1873

J. Pinnley Colonel,
Superintendent Revenue Survey.

Enclosure to Letter
No. 1317/85 of 4th June
1873

Revenue Dept.
15b

Memo. for Orders on No. 2884.

From Board of Revenue
submitting report on present & past
Establishment of Survey Settlt. &c.
} 2 Sept. 1873, No. 1729

In 1871 the Surveyor General of India, Col. Thuillier suggested that Col. Priestley's hands should be strengthened in order to enable him to make more rapid progress with the topographical Survey of this Presidency, so that the Revenue Survey materials so long lying idle might be utilized for geographical purposes, and complete District Maps on a tangible scale prepared.

2. Col. Priestley accordingly submitted Estimates for two additional Survey parties

to

to be employed on this work at a cost of a little over £10,000 per annum. These estimates were forwarded to the Govt of India on the 22nd February 1872, but before sanctioning the proposed increase of Establishment they desired to have a full account of the present cost, strength of establishment, work done, and to be done, by the Survey Dept, as well as the financial results. They also enquired whether the collection of geographical materials could not proceed with the present establishment and suggested a reduction in the scale of topographical

topographical surveys from 4 inches to the mile to one inch to the mile.

3. The Supt accordingly submits the information called for, which is summarized by the Board in their Proceedings. The Board explain that about 36,000 square miles of Revenue Survey have been completed and 11,428 square miles of topographical Survey. To complete the Districts in which work has been already commenced there remain 18,647 square miles of Revenue-Survey, and 41,353 square miles of topographical Survey

Survey. Estimating that the Survey work will progress at the same average rate as they have done from the commencement, the Board think 5½ years will complete the revenue work, and eleven years the topographical work. It is to be noted, however, that for the last three years the average progress has been considerably below the rate estimated. Unless therefore work is much more speedily performed than it is at present, a considerably longer period will be required.

Further

4. Further, the Board in addition to the Districts of Janjira, Malabar and Kanara have omitted Vizagapatam from their calculation, though it is well known that a survey and settlement is more required in the Govt talaks of that District than in most other localities of the Presidency.

5. Similarly, in estimating the cost to be hereafter incurred in completing the work in the Districts now on hand the Board accept the Supt of Survey's estimate of Rs 130 per mile for

Revenue

revenue survey, and Rs 14 per mile for topographical survey, but it is to be observed that during the past three years the survey has worked at a cost of Rs 253 per mile for Revenue survey and Rs 25 per mile for Topographical survey, and it seems unlikely that these rates will be reduced to the extent stated.

6. The Board finally recommend that one additional party at cost of Rs 50,000 per annum (thus raising the annual survey expenditure to £75,000) be sanctioned for bringing up the topographical arrears, and that the scale of topographical Survey be reduced as suggested by the Govt of India.

Revenue Dept.

110

No. 584

Pro. of the Madras Government.

dated 11th May 1874.

Read the following papers.

Letter from Govt of India, Dept of Agriculture, Rev & Commerce - - - - - - - - - -	
Pro. Board of Revenue Submg report on present & past strength & cost of Survey establt; &c.	} G.O. 13 May 1872. G.O. 2d Sept 1873. No. 1729
Ltr. Board of Revenue Settlement offering remarks with refce to Order of Govt 20 May '72. on certain points noticed in Col. Priestley's Memo: reporting working of the Survey Dept.	} G.O. 14 Oct. 1873. No. 2279/57

Ordered that the above Proceedings of the Board of Revenue be forwarded to the Govt of India with the intimation that this Govt support the proposal made by the Board of Revenue that sanction should be accorded for the entertainment for at least one additional Survey Party to be employed under Colonel Priestley exclusively in bringing up arrears at

at a cost of say Rs 50,000 a year, and that a scale of 2 inches = 1 mile should be adopted for all Topographical Survey.

2. The Govt further consider it essential that the addition to the Central office asked for in Colonel Priestley's letter dated 6th Jany. 1872, No 20/3 (G.O. 22. Feby 72, No 328 Res. Dpt) should be allowed for the purpose of expediting the compilation and lithographing of the Maps embodying the Topographical details. As there are so many arrears to bring up His Excellency the Governor in Council thinks that the full amount should be sanctioned, but, as soon as it can be managed, the

the extra establishment estimated at Rs 1088 per mensem may be reduced.

No 584 — 4 May 1774 112

1. Read Proceedings of the Board of Revenue dated 2d Sept 1773 Vol 17 29.
2. Read Letter from the Director & Settlement of Rev Cadra 14 Oct 73 No 2274/57

Ordered that the above Proceedings of the Board of Revenue be forwarded to the Court of Judica with the intimation that this Govt. support the proposal made by the Bd of Revenue that sanction should be accorded for the entertainment of at least one additional Survey Party to be employed under Colonel Priestley & Lucas in tracing up arrears of a

2. Govt consider it essential that [illegible] addition to the Central Office asked for in Col Nicolls's letter dated 6 January 1872 No 20 (G.O. 22 Feb 1872 No 328 Rev) should be allowed for the purpose of expediting the compilation & lithographing of the topographical details. There are no arrears owing up to 31 March 1872 that the full amount should be sanctioned but as soon as it can be managed, the Letter of the extra establishment estimated at Rs 1088 per mensem might be reduced.

cost of say Rs 50000 a year, and that a scale of 2 inches = 1 mile should be adopted for all Topographical survey.

No 384 — 1 May 74

Govt of India

With reference to the Secretariat letter of the 13th May 1872. I am directed to forward herewith an accompanying proceedings of the Board of Revenue for the consideration of the Govt of India and to state that this Govt respectfully solicits sanction should be accorded for at least one additional survey party to the sub-

d/ 2 Sept 1873 No 1729.

2. I am further to state that in the opinion of this Govt it is essential (here enter rest of para 2 of G.O.)

add

3. I am further directed to state that of the remarks made in the Secretariat letter as to the advisability of expediting the collection of topographical materials "by a change in the constitution of parties or a redistribution of the Revenue and Topographical branches or in any other way" which was intended in any way to affect the withdrawal of the topographical surveys from the Revenue Survey establishments

priately & charged in bringing up arrears, what cost of say Rs 50000 a year, and that a scale of 2 inches = 1 mile be adopted for all Topographical survey.

or to exclude topographical details from the Madras Revenue Survey, then the suggestion is one which this Govt feel confident should as a matter of good policy and economy not be acceded to. They would in the strongest manner deprecate any measure which would entail on the Survey Dept of this Presidency the undeserved censure.. consequent on the withdrawal from them of any part of the work which they have hitherto performed to the entire satisfaction of the Home and Head Govt. or which would deprive the revenue Survey of this Presidency of the most valued element of Topographical details in Village Talook and District Maps.

4. The G. will reflect the delay which has taken place in reference to the present reference &c. &c. The G. in C. will see that it was occasioned by the application for a complicated Survey

5. The addition is I am to add, additional to the revised establishment subject to the same

14 To the Bd of Rev dec 26 May/74
13 Survey Rev settlement
13 Settling Rev Survey

11/5/74 No 584

134-137