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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue DEPARTMENT

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*Proceedings of the Madras Government, Revenue Department,
28th May 1875.*

No. 324. Read the following Endorsement of the Under-Secretary to the Government of India, Department of Revenue, Agriculture, and Commerce, (Surveys,) dated Simla, 15th May 1875, No. 342:—

Read the following Proceedings of the Government of India, Financial Department, (Expenditure,) dated Calcutta, 14th April 1875, No. 2,117.

Read the following letters:—

No. 1,074, dated 17th July 1872, from the Government of Madras, requesting sanction to the employment of a photozincographer on Rs. 150 a-month, to be increased after each year of satisfactory service by Rs. 50 a-month during the three years for which he was to be engaged.

No. 498, dated 12th August 1872, from the Government of India in the Revenue Department, stating that the application for a photozincographer would be considered on receipt of a reply to their letter, No. 301, of 13th May 1872, regarding the geographical materials available from the Madras Revenue Surveys.

No. 584-A, dated 11th May 1874, from the Government of Madras, replying to the letter of 13th May 1872, and requesting sanction for an expenditure of Rs. 50,000 a-year for a topographical survey party, and of Rs. 13,056 a-year for strengthening the compiling and lithographic branches of the Office of the Superintendent of the Madras Revenue Survey.

No. 587, dated 14th May 1874, from the Government of Madras, forwarding proposals which Colonel Priestley, Superintendent of Revenue Surveys, had submitted in a letter, dated 22nd May 1871, for placing the Madras Revenue Survey Department generally on a better footing, the proposals being irrespective of, or additional to, the expenditure of Rs. 63,056 a-year, recommended in the letter No. 584-A.

RESOLUTION.—In a memorandum on these proposals, which has been prepared in the Financial Department, various objections have been raised to the large expenditure involved, and certain points have been suggested for consideration respecting the slow progress of the Madras Revenue Survey, and the very considerable amount by which the cost of the entire survey and settlement will exceed the original estimate.

2. Without adopting any of the views which are put forward in the memorandum, the Governor-General in Council considers that explanation ought to be afforded on the several points raised in it, and that the Government of Madras should state how far the remarks in the memorandum are incorrect, and, for the rest, what modifications they have to suggest to remove the objections taken.

ORDERED that a copy of this Resolution and of the memorandum of the Financial Department be sent to the Revenue Department for communication to the Government of Madras.

(Signed) R. H. HOLLINGBERY,
Assistant Secy. to the Govt. of India.

ENCLOSURE No. 1.

Register No. 3,703.

INCREASED EXPENSE FOR MADRAS REVENUE SURVEYS.

With the first of their letters, dated 11th May 1874, the Government of Madras has forwarded Proceedings of the Board of Revenue, No. 1,729, dated 2nd September 1873, in which

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the past work and organisation of the Revenue Survey Department are reviewed. Those Proceedings quote a letter, No. 1,581-45, of 28th July 1872, in which the Superintendent of the Madras Revenue Survey reported on the same subject, but the report has not been submitted.

2. The Revenue Department does not recommend the expenditure of Rs. 50,000 a-year for a topographical survey of forest or waste lands which were advisedly omitted by the Revenue Survey Department from its surveys. Accordingly, the additions to the Central Office, amounting to Rs. 1,088 monthly, for compiling and mapping the results of the proposed topographical survey are not required.

3. The proposals submitted in the letter, No. 587, dated 11th May 1874, are as follow:—

	Present.		Proposed.		Increase.	Decrease.
	NO.	RS.	NO.	RS.	RS.	RS.
I.—Central Office	...	47,232	...	67,566	20,334	...
Deputy and Assistant Superintendents	25	1,09,200	15	92,400	...	16,800
Sub-Assistants and Boundary Inspectors	10	18,000	15	34,200	16,200	...
II.—Five survey and five demarcation parties, exclusive of officers	...	1,74,432	...	1,94,166	36,534	16,800
Stores, contingencies, temporary establishments, travelling allowances, &c.	...	4,31,870	...	4,66,440	34,570	...
Half a survey and half a demarcation party	...	1,34,400	...	90,150	...	44,250
...	...	87,293-8	...	68,319	...	18,974-8
...	...	8,27,995-8	...	8,19,075	71,104	80,024-8
Decrease ...					8,920-8	

The net increases of Rs. 19,734 in the first section on account of pay for European supervision, and Rs. 34,570 in the first item of the second section on account of the pay of subordinate establishments, are set off principally by a reduction of expense on account of stores, measurers, coolies, batta, travelling allowance, and contingencies. But savings in these items, which, by reason of their uncertain fluctuating character, are not securely limited within a sanctioned scale, are not regarded as a set-off to an increase of salaries and establishments, while the reduction of Rs. 13,020, which is proposed in the charge for duffadars, peons, measurers, &c., is for kinds of establishments that are supplemented by temporary establishments.

4. The sum of Rs. 8,27,995-8-0, which is taken as the present scale of charge, includes credit for the cost of five and a-half demarcation parties, whereas the number of such parties as sanctioned and as existing in 1873-74 according to paragraph 12 of the Madras Revenue Board's Proceedings, dated 2nd September 1873, and according to the book of establishments, dated 1st April 1874, was two and a-half, showing an excess credit for three demarcation parties. The annual cost of a demarcation party, according to the scale sanctioned in 1866, is Rs. 47,750, and at that rate the excess credit for three parties is Rs. 1,43,250. There is further an excess credit of Rs. 21,253-8-0 for a half survey party and a half demarcation party; the cost of these, at the rate sanctioned, would be Rs. 66,040, whereas credit for them has been taken at Rs. 87,293-8-0 in the present scale. Thus the aggregate excess credit is Rs. 1,64,503-8-0, besides another error arising from an excess over sanction in the rate of lumped cost of one survey and one demarcation party.

5. If the excess credit of Rs. 1,64,504 be deducted from the total (Rs. 8,27,996) of the present scale, the sum available for meeting the cost of the revision becomes Rs. 6,63,492 as the

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total sanctioned cost of the revenue survey, including such demarcation as is under the Superintendent of that survey. The actual expenditure according to the administration reports, was Rs. 6,42,221 in 1870-71 (i.e., when Colonel Priestley framed his scheme in May 1871, and yet claimed a credit for Rs. 8,27,996 as present expenditure), and Rs. 6,80,906 in 1872-73. According to the finance accounts the actual expenditure in 1873-74 was Rs. 6,93,570.

6. Instead, then, of a saving of Rs. 8,920-8-0 (paragraph 3 of this memorandum), the proposals submitted in the letter of the Madras Government, No. 587, dated 11th May 1874, involve an increase of Rs. 1,55,583,—exclusive of minor excess credits not thrown out of the present scale, and after allowing credit to the revised scale for the large illusory saving in contingencies, and in subordinate fixed establishments of kinds that are supplemented by temporary establishments outside any sanction of a scale of fixed establishment. By throwing out these latter savings, the real additional expenditure would be found to exceed two lakhs a-year.

7. Besides the illusory saving under contingencies and petty establishments, the greater part of the reduction under Assistant Superintendents is nominal. In the present scale there are shown twenty Assistant Superintendents for five survey parties, including demarcation, being in the proportion for each party, of two Assistants for survey, and two for demarcation. But, though two Assistants were added to the Revenue Survey Department for each of two demarcation parties, on the partial transfer of demarcation work from the Settlement to the Survey Department in 1865, yet the addition of the second officer for each of the parties was erroneous, only one Assistant having been allowed in the complement of a demarcation party when it was under the Settlement Department; and in 1873-74, only one Assistant was retained for each party. Accordingly, with the two demarcation parties of full strength, which were maintained in 1873-74, there were only two Assistants, while credit has been taken for four, showing an excess credit of two Assistants for the two demarcation parties of full strength, actually maintained. Besides this, there is an excess credit of six Assistants, at two each, for three demarcation parties which are not maintained, thus making an aggregate nominal reduction of eight Assistants out of the gross decrease of ten Assistants, which is shown in the proposition statement. The nominal reduction of the cost of eight Assistants is Rs. 28,800 a-year for pay and Rs. 7,200 for travelling allowance. If the nominal reduction of Rs. 28,800 in pay of eight Assistants be deducted from the gross credit, in the present scale, of Rs. 1,09,200 for twenty-five Deputies and Assistants, the sum to be set against the revised charge of Rs. 92,400 for fifteen Deputies and Assistants becomes Rs. 80,400, or an increase of Rs. 12,000 instead of a decrease of Rs. 16,800.

8. This increase of expense for fifteen Deputies and Assistant Superintendents would occur from a revision of the pay of those grades which is proposed as follows:—

	A. Existing Staff Pay.	B. PROPOSED PAY.			Rate at which cost has been reckoned in Scheme.	BENGAL SCALE OF 1866.	
		Staff, exclusive of Military Pay.	Maximum for Military Officers.	Civil Officers.		Maximum for Military Officers.	Consolidat- ed for Civil Officers.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Deputy, 1st grade	500	800	1,600	1,100	790	1,800	1,100
" 2nd "	500	650	1,300	900	790	1,400	900
" 3rd "	350	650 C	1,150	700	450	1,200	700
Assistant Supdts., 1st grade	250	Not stated in the revised scheme.			450	750	500
" 2nd "	250				300	750	350

A.—This is the entire remuneration for civil officers, with the exceptions stated in paragraph 18 of the office note: military officers get military pay of rank in addition, irrespective of any such maximum limit as is provided in the revised scale; and both military and civil officers receive a fixed travelling allowance of Rs. 75 a-month, in addition, in the grades of Deputy and Assistant Superintendents.

B.—Exclusive of travelling allowance at (not specified) per diem rates under the police regulations.

C.—Perhaps a misprint for Repees 600.

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9. One reason for the revision is that "the cost of supervision, that is, in short of military officers of high rank, has latterly become so great that the funds of the department cannot bear it, more especially as the higher paid military officers, from age and long residence in the country, &c., are, as a rule, less efficient than younger and more active men." This reason, however, would support a limitation of the emoluments of Military officers in the grade of Deputy Superintendent to a sum less than the total of staff salary, *plus* military pay in the higher military ranks: whereas on 1st April 1874 there were—

	OLD SCALE OF PAY IN INDIA.			REVISED SCALE.			Maximum.
	Staff.	Pay.	Total.	Staff.	Military Pay.	Total.	
On furlough.	Rs. 500	Rs. A. 827 14	Rs. A. 1,327 14	Rs. 800	Rs. A. 827 14	Rs. A. 1,627 14	Rs. 1,600
In India { Deputy Superintendent, 1 Lieutenant-Colonel.	500	415 6	915 6	{ 800 650 500 }	415 6	{ 1,215 6 1,065 6 915 6 }	1,600 1,300 1,150

Instead of reducing these emoluments, as is deemed expedient, the revised scale would give a substantial increase to the only two military Deputies in the department, of whom one was on furlough. Failing this reason, the increase is supported by another reason, *viz.*, that Deputy Superintendents serve a long time without increase of pay. "Major Hessey, for instance, has served thirteen years in the same grade and on the same pay. In Bengal he would, for the last seven years, have been drawing Rs. 300 per mensem more than he has done."

10. Another reason for the increase of pay and for introducing a maximum limit for the aggregate of staff corps pay, *plus* military pay of military incumbents, is put forward in a representation by a committee of officers, including a military officer of the department, "bringing to notice the necessity of revising officers' salaries, so that a subordinate may not draw more salary than his official superior: recommend Bengal rates of pay as suitable." Colonel Priestley remarked on this: "That this is necessary is undeniable. What is referred to is that a first Assistant Superintendent, being a Captain, draws Rs. 800, and an Uncovenanted Deputy Superintendent placed over him only Rs. 750. * * In like manner, some limit as to the rank, or age, or service of military men in the department is desirable, inasmuch as one military Deputy Superintendent will draw more than double the monthly pay of an uncovenanted officer of the same grade and of longer service in the department."

11. The revised pay proposed for military officers as Assistant Superintendents is not given, however; on the existing scale they draw, as staff pay, the full civil pay of an Uncovenanted Assistant Superintendent, and military pay of rank in addition: if it be intended that they should similarly draw revised civil pay of an Assistant *plus* military pay of rank, the amount for the several military officers who are Assistants, will be as follows:—

	OLD SCALE OF PAY.			REVISED SCALE.		
	Staff Pay.	Pay.	Total.	Staff.	Military Pay.	Total.
1st Assistant Superintendent, 1 Captain.	Rs. 350	Rs. A. P. 374 1 0	Rs. A. P. 724 1 0	Rs. 450	Rs. A. P. 374 1 0	Rs. A. P. 824 1 0
2nd " " 1 "	250	415 6 0	665 6 0	300	415 6 0	715 6 0
3rd " " 1 "	250	374 1 0	624 1 0	300	374 1 0	674 1 0

According to paragraph 8, the revised salary proposed for an Uncovenanted Deputy Superintendent, 3rd grade, is Rs. 700, which is less than the existing emoluments of a military Assistant Superintendent, 1st grade, and slightly more than those of a military Assistant, 2nd grade. Either, therefore, the limitation to be imposed on the staff salary, *plus* military pay, of military

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Assistants should reduce that aggregate considerably, or the salaries of civil officers must be raised still further.

12. The latter alternative would be forced on the Government were the principle of the scheme to be accepted; for that principle is to extend the Bengal rates of pay to the officers of the Madras Revenue Survey, with only a lower maximum than in the Bengal scale of 1866 for the staff salary, *plus* military pay, of military incumbents. But the Bengal rates which, with the above modification, the Madras Committee and Colonel Priestley recommended are those sanctioned in 1866, which were in force in 1871 at the date of Colonel Priestley's proposals. These rates, however, are to give place to consolidated salaries, which, if finally sanctioned, will compare as follows with Colonel Priestley's revised scale, *viz.* :—

	BENGAL SURVEY DEPARTMENT.		COLONEL PRIESTLEY'S REVISED SCALE.		
	Former rate for	New consolidated Pay for Military and Civil.	Military Officers.	Maximum of aggregate Military emoluments.	Civil for Uncovenanted Officers.
	Military Officers.	Civil.	Staff Pay.		
	Rs. A.	Rs. B.	Rs. C.	Rs. D.	Rs. E.
Deputy Superintendent, 1st grade	800	1,100	1,600	800	1,600
" " 2nd "	650	900	1,300	650	1,300
" " 3rd "	500	700	1,000	650	1,150
Assistant Superintendent, 1st grade	375	500	750	450	700
" " 2nd "	250	350	600	300	450
" " 3rd "	150	250	500	...	300

A.—Besides Military pay of rank.

B.—Besides old net Military pay for officers of Royal Engineers.

C.—Apparently a misprint for Rupees 500.

13. Colonel Priestley's maximum, which is to limit the aggregate of staff pay, *plus* military pay, for military incumbents, is the same as the new consolidated pay in Bengal for Deputy Superintendents, 1st and 2nd grades, while it is more than the latter for a 3rd grade Deputy. On the other hand, Colonel Priestley's scale for uncovenanted officers is considerably less than the Bengal scale. If, therefore, the principle of Colonel Priestley's revision be accepted, *viz.*, that the Madras scale should be assimilated generally with the Bengal scale, and that uncovenanted officers should not get less than military officers in junior grades of the department, there would be a liability for an increase of cost for civil officers, beyond that which is estimated by Colonel Priestley, and for an immediate increase, for military officers, to Colonel Priestley's maximum.

14. The existing staff pay of Deputy Superintendents is Rs. 500, and out of five Deputies, four are civil officers and one a staff corps officer on furlough, in whose room another military officer is acting as Deputy. If the title of military officers, in the grade of Deputy, to a staff pay of Rs. 500 rising to Rs. 800, besides staff corps pay, be recognised, then the Executive Engineers, first grade, in the Madras Presidency, who received a staff pay of Rs. 600, and who are now limited to a consolidated salary of Rs. 950 monthly (besides net military pay of rank for royal engineer officers), will consider themselves underpaid, especially if the revised pay for uncovenanted officers of the Survey Department in Bengal be finally sanctioned and extended to the similar officers in the Revenue Survey Department, Madras.

15. The Assistants in the Settlement Department receive the same pay as those in the Revenue Survey Department, and any increase of the pay of the latter will have to be given to the former.

16. Considering the extensive disturbance of the general scale of salaries which might follow the revision of the pay of the officers of Madras Revenue Survey, especially on a principle

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of assimilation with the Bengal scale, and that the amount of increase proposed is large, compliance with the proposal of the Madras Government seems inexpedient.

17. It is proposed to add so much as Rs. 20,234, or more than two-fifths of present charge, to the cost of a central office which controls operations of survey parties whose annual outturn of work since 1865-66 has been very much less than it was down to 1864-65, as follows, viz. :—

	No. of Parties.	Square Miles.		No. of Parties.	Square Miles.
1861	5	4,260	1868-69	5	2,264
1862	5	4,902	1869-70	5	3,517
1863	5	4,764	1870-71	5	3,578
1864	5	3,338	1871-72	5	3,132
1865	5	2,956	1872 (to 31st Dec.)	5	2,499
1866	5	2,720			
1867-68	5	2,667			
„ (3 months)	5	389			

18. In support of a further small expense for a photozincographer, it is urged that photozincographic establishments are allowed for the Survey Departments in the Bengal and Bombay Presidencies. In Bombay an Assistant Superintendent of Survey on Rs. 800 a-month is in charge of the photozincographic office at Poona. In Calcutta a still better-paid Assistant Surveyor-General is in charge; and in Dehra Doon one of the officers on the staff of the Superintendent, Great Trigonometrical Survey, has charge. The present application is, therefore, probably, the mere beginning of a larger expenditure. In Calcutta the expense of the office has, perhaps, been more than covered by arrangements for reducing the work of survey parties. Colonel Gastrell writes as follows, in the report on the operations of the revenue survey for 1872-73, in respect of cadastral surveys :—

I.—“My most serious attention has been given during the year to the best mode of reducing the strain on the survey office which such a vast number of small field surveys necessarily involves, especially in securing copies of the maps, without errors in field boundaries, or in numeration of fields: and I hope by the introduction of carbonic tracing paper in making copies for the settlement officer to ensure a *fac-simile* copy simultaneously with the inking in of the original field plan, and by so doing entirely save the enormous labor now involved in making final comparisons (which, at best, with such a mass of work, are but imperfect); and at the same time so to prepare the field sheets that they can be reduced and printed from direct by the aid of photozincography.”

II.—Some sheets may not admit of reproduction by photozincography, and in such cases I propose, by the introduction of a new transfer ink of Lieutenant Abney's, R.E., of the Ordnance Office, Southampton, to make good and cheap copies on transfer or vellum cloth. This process does not require the intervention of a tracing glass and a dark room, to which the majority of errors in copying may be attributed.”

III.—By these processes the labor of mapping will “be reduced to a minimum, and Government may be supplied with copies of these valuable cadastral field maps for from 3½ Annas to 4½ Annas per imperial sheet containing 1,250 acres.” * * *

IV.—According to the “Manual of Surveying for India,” published in 1851, page 522, “the pergunnah map on the one inch, and the village map on the four-inch scale (or that of the Revenue Survey, Bengal) form the only returns for the Surveyor-General required of surveyors with the exception of an *index sketch*, or outline of the several circuits surveyed during the season, which is given on a scale of *four miles to the inch*. This is intended as a mere guide to the compiler, and explanatory of the annual report. The utmost care is required in the preparation of the pergunnah plans on a scale of *one inch to the mile*.” This latter map, so troublesome to prepare, is no longer required from a revenue survey party. During 1873 a considerable change has been made in the mode of preparing maps for publica-

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tion on the scale of one mile to the inch, whereby executive officers have been relieved of the pentagraphing and preparation of the one inch general mapping which so heavily taxed their resources, and have been left free to devote their time and means, thus saved, to the better perfecting and examination of the village atlas sheets and computations for the head office.”

19. The propositions of the Madras Government include additional charge for strengthening the Central Office, and each survey party, for the work of compiling, drawing, and copying maps. The preceding extracts show how the work under all these heads, both in the Central Office and in the offices of executive officers in charge of survey parties, has been, and is being reduced, by utilising to the utmost the process of photozincography and the new transfer ink invented by Lieutenant Abney. Much of this reduction of work was stimulated by the necessity of relieving the cadastral survey parties in the North-Western Provinces of the immense detail of copying maps of “the enormous number of fields” surveyed by them. The pressure on the Madras Revenue Surveys is of the same character and extent, and it apparently admits of a like remedy.

20. The several scales of mapping required in the Survey Department, Bengal Presidency, are—

1. General maps, eight or sixteen miles to the inch, for forming maps of provinces.
2. District compilation, usually on the geographical map-scale of four miles to the inch (or ¼ inch = 1 mile) prepared from No. 3.
3. One inch to a mile, rendered by topographical surveys, and 4 inches to the mile, rendered by revenue surveys.
4. Sixteen inches to a mile, rendered by the cadastral surveys in North-Western Provinces.

In Bengal 1 and 2 are prepared in the Central Office, and 3 and 4 by the survey parties. In the Madras Presidency No. 2 is to be prepared in the Central Office, but it is not finished for any one district. Taluq maps on the scale of two inches to the mile take the place of No. 3, and they are prepared by the survey parties; so that as No. 2 is likely to remain unfinished, there is but little work of compilation in the Central Office; its duties, as stated by the Superintendent, “are chiefly those of check and control,” that is, testing and recomputing about 20 or 25 per cent. of the area lists submitted by the survey parties. In the memorandum of 22nd May 1871, it is stated that “some work at present performed in the district survey offices ought to be transferred to the Central Office as, for instance, the compilation of taluq maps.”

21. For this compilation of taluq maps in the Central Office there is proposed the increase of establishment which forms items 1 and 2 in Section I. of the table in paragraph 16, viz., in the drawing and lithographic departments to the amount of Rs. 6,702 for principally draughtsmen, tracers, and examiners, and in the general branch to the amount of Rs. 12,600 for principally two civil Assistants, obtained by transfer from the field parties, and for three other civil Assistants, converted into such from Head Assistant, Office Assistant, and Head Draughtsmen, for, manifestly, the supervision and conduct of the compilation of taluq maps from the village maps.

22. If the Bengal plan were to be followed, the original of the village maps by the survey parties would be prepared with sufficient care, accuracy, and neatness, to admit of a copy being printed from them direct by the photozincographic process; the surveying party would be relieved of the fair copying, and of the trouble of making a second and third copy for, it is believed, the Collector and the Settlement Department; while the Central Office would reduce, from the village to the taluq scale, through the photozincographic process, more expeditiously and with less trouble and expense than under the arrangement proposed by the Madras Government. The main requisite is the ability of the draughtsmen or surveyors with the survey parties to prepare the original map with sufficient accuracy and neatness to admit of printing from it direct by the photozincographic process.

23. The bulk of the increased expense proposed for a survey party is under the head of deputy and detail surveyors and gomastahs, draughtsmen, and computers. The additional annual

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charge under this head is Rs. 93,720 for four parties, or Rs. 18,744 for each party. It is explained that "it has hitherto, as a rule, been found that field work outstrips the processes performed in office (plotting, drawing, and computing). Hence it has been deemed advisable to strengthen the establishment of computers and draughtsmen." This object will commend itself to the Government of India, especially when the slow progress, hitherto, of the revenue survey and settlement in the Madras Presidency is considered. But expedition is more likely to be ensured by utilising, to the full, improved mechanical processes, as in Bengal, than by simply enlarging establishments which are, perhaps, already overgrown. The Madras Revenue Survey parties do the same work as the cadastral survey parties in the North-Western Provinces, excepting that demarcation work for these latter is done by the Settlement Department, while a Madras Revenue Survey party does its own demarcation. The average cost of a cadastral survey party in the North-Western Provinces in 1872-73 was for—

Professional survey, including officers	Rs.
Cadastral or field surveys on the Madras scale of sixteen inches to the mile	61,224
	25,654
	86,878

According to the present proposals of the Madras Government, the cost of a Madras Revenue Survey party will be Rs. 1,36,638; but this includes demarcation, which, on the old scale, cost Rs. 20,014. In the revised scale a saving has been effected in this old charge for demarcation; accordingly if Rs. 20,014 be deducted from Rs. 1,36,638, the residue, Rs. 1,16,624, will somewhat understate the proposed cost of a Madras Revenue Survey party, excluding demarcation. This sum is Rs. 29,746 dearer than the cost of a corresponding party in the North-Western Provinces. The outturn of a cadastral survey party in the North-Western Provinces, with a field season of only seven months, is about 600 square miles, which, for five and a-half parties, would give 3,300 square miles. The outturn of five and a-half Madras survey parties, with a field season of ten months, was 2,969 square miles in the years from 1866 to 1872. In 1871-72 it was 3,132 miles, and the Superintendent of the Survey promises an increase; but still the difference in annual cost is considerable, the Madras party being 30 per cent. more expensive than the North-Western Provinces party, even after accepting for the latter the present expensive organisation, which Colonel Walker is evidently of opinion can be cheapened with an improvement in efficiency, that is, in annual outturn.

24. The expectation that a Madras Revenue Survey party, if reorganised in the manner proposed, will work more rapidly seems illusory. It is proposed that the two and a-half demarcation parties now attached to that number of survey parties, but under separate Assistant Superintendents, shall be amalgamated with the latter, so as that the same men shall demarcate and do the interior survey. At present in one season a demarcation party under an Assistant Superintendent gets through the demarcation of sixty villages in one taluq, while the Revenue Survey party under its officers gets over other sixty villages in another taluq. Yet it is expected that when the establishments are united and concentrated for work in the same taluq in reduced strength, with one Assistant less, the distinct operations of demarcating and of interior survey, and of settling boundary disputes, which last owing to the litigation involved is a tedious business (*Memorandum by Director of Revenue Settlements, dated 14th October 1873*), will be got through in ninety to a hundred villages. The anticipations of the Revenue Survey Department have not been realised in the past; and the outturn of its survey parties has been less since demarcation work was made over to it, even with separate demarcation establishments, than the outturn it gave until the year 1865 when demarcation was done by the Settlement Department. This is apparent from paragraph 17 of this memorandum and from the remark of the Director of Revenue Settlements, that 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."

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25. The expectation of rapid work is, indeed, modified in the statement that "instead of six or eight years elapsing between the commencement of demarcation and completion of survey, it would be possible to prepare a taluq for settlement in two years at the latest; that is to say, that an uninterrupted supply of survey areas could by that time be depended on." The eight districts, omitting Ganjam, in which surveys are in progress, viz., Cuddapah, Coimbatore, Tinnevely, Chingleput, Nellore, Ganjam, and the unfinished taluqs in Kurnool, contain sixty-eight taluqs, giving an average of eight and a-half taluqs per district: an entire district would thus be prepared for settlement in seventeen years.

26. The slow progress of the Madras Revenue Survey implies a considerable loss of revenue, superadded to heavy expense; and perhaps it may be held that the facts relating to it cause grave anxiety. Since 1858, when the survey was estimated at 60,000 square miles, North Canara has been transferred to the Bombay Presidency, and it has been decided that a revenue survey is not required for Tanjore. The sixteen years from 1858 to 1873-74, which have since elapsed, are two years more than the fourteen originally fixed; while they extend five years beyond the term of eight years in which, as afterwards reported by the Madras Government in November 1861, they were confident that the work would be finished with the enlarged establishments given in 1860. The work which has been done is as follows:—

	Estimated total Work.	Actually surveyed.	Remaining to be surveyed.	Proportion finished.
	SQ. M.	SQ. M.	SQ. M.	PER CENT.
Revenue Survey	55,032	36,385	18,647	66
Topographical	52,783	11,428	41,355	21.7
	107,815	47,813	60,002	

And the cost has been as follows:—

	Square Miles.	Total Cost.	Cost per Square Mile.
		RS.	RS. A. P.
Revenue Survey, 16 inch=1 mile	36,111	55,37,012	153 5 3
Topographical, 4 and 2 inch=1 mile	14,340	2,31,613	20 6 9
	47,451	57,68,625	121 9 1
Special Surveys, 16 and 4 inch=1 mile	362	5,68,381	1,570 1 10
Total	47,813	63,37,006	132 8 7

The rate of Rs. 153 per square mile for the revenue survey is exclusive of that for demarcation, which, as effected by the Survey Department, has involved a separate charge of Rs. 56 per square mile, or a total of Rs. 209 per square mile. The original estimate was Rs. 55 for survey and Rs. 10 for demarcation; total Rs. 65 against an actual of Rs. 209 per square mile.

27. According to a report submitted by the Madras Government in August 1867, supplemented by such information as can be gathered from the pretty full details in the administration reports of the Madras Presidency, it appears that only five districts have been settled since 1858, and these were settled,—one in 1860-61, two in 1866-67, and one in each of the next two years. Since 1868-69, not another district has been entirely settled, though portions of districts have been settled, the explanation apparently being that "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 have been increasingly transferred, thereby bringing up the establishment and expenditure in the Survey Department to their present standard; and, as already explained, topographical 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 revenue survey establishment and expenditure to those more general objects, which accounts, in some measure, for the increasing degree in which the survey lags behind the urgent needs of the Revenue and Settlement Department." (Colonel Priestley, 12th June 1873).

28. It was estimated in 1858 that four survey parties on the limited scale then sanctioned would give an outturn of 4,400 square miles per annum. But in 1860 the survey parties were enlarged for providing an outturn of 1,400 square miles for each party, or of 7,000 square miles for five parties, or 7,700 square miles for five and a-half parties. From 1861 to 1865 there were five parties, and during that period they were not encumbered with demarcation; yet the average annual outturn was barely 4,000 square miles: from 1866, when the Survey Department got encumbered with demarcation, it has been less than 3,000 square miles for five and a-half parties or say 3,000 square miles against a proper outturn of 7,700 square miles.

29. In 1858 the annual scale of expenditure for the larger outturn was fixed at Rs. 5,47,616, giving for fourteen years, in which the work in nineteen districts was to be completed, Rs. 76,66,624, and this estimate was reaffirmed by the Madras Government in 1861. At the present day the outlay is at the rate of nine and a-half lakhs a-year, but with an outturn of only 3,000 square miles a-year, and with settlements finished in only five districts, and the entire work may not be completed for less than two crores.

30. This failure in outturn has occurred in spite of a contraction of the original plan of detailed survey. The Madras Government recorded on 12th December 1864, that "under existing rules the survey extends to all land usually cultivated, all that has ever been cultivated, and such land, not included in these classes, as may seem likely to be brought under the plough on the extension of cultivation, consequent on lighter assessments, and on an improved revenue system. The disadvantages attending this rule are, that a considerable area is surveyed at a heavy cost in time and money which may not be cultivated for years, and which may not even then be taken up in the blocks in which it is laid down in the survey. It will often happen that, however well the survey officers may lay out the fields, these may not suit the convenience or means of the ryots, and the Government are in the dilemma of compelling the ryots to adopt their holdings to the arbitrary arrangements of the surveyor, or of losing the advantages of the survey. Moreover, it is practically almost impossible to preserve boundary marks in waste land. The Government think it advisable to limit the detailed survey to the land actually occupied, and such adjacent tracts as, from their position, &c., are likely to be cultivated within two or three years, the latter being surveyed in blocks of about ten acres in dry and four acres in wet land."

31. The original plan of survey having been thus contracted, progress should have been accelerated, whereas now the outturn from five and a-half parties is smaller than that obtained, until 1865, from five parties. Apparently this retardation of work where accelerated progress was to be expected is due to three causes, viz.,—first, the transfer of demarcation work from the Settlement to the Survey Department; second, the employment of portions of the revenue survey parties on non-revenue-paying portions of some districts, while revenue-paying parts of other districts are awaiting survey and settlement; third, the immense detail work of measuring minor fields within survey fields. The first cause of delay has been noticed in paragraph 17 of this memorandum. The second cause is avoidable; for the permanency of the survey in revenue-paying parts of districts being secured by permanent boundary marks, it can make no difference, in the long run, as to the time for completing the survey of the entire Presidency, if the revenue-paying portions be finished first, and those which do not pay revenue, or which are not likely to

pay revenue within two or three years, be finished afterwards; while it must make a great difference in the financial result if the increase of revenue from revised settlements be delayed by giving precedence to topographical survey work.

32. Moreover, as reported by Colonel Walker, accurate surveys of the greater parts of the Madras Presidency for incorporation in the Indian Atlas already exist; while the Surveyor-General of India, so far as he has hitherto reported, is averse from accepting for the Indian Atlas any compilations from the Madras Revenue Survey which he is not in a position to verify.

33. The third cause of delay is the survey of interstitial fields. Respecting these the Director of Revenue Settlements, Mr. Banbury, observes that "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." And Colonel Priestley remarks that "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 some districts these fields have been measured by the Survey Department after the close of their own special work, and the cost has been in consequence excessive. Again, these measurements have been in other districts made by the Settlement Department, but with what result is not known. The cost of the process has been less: but whether sufficient checks to secure trustworthy measurements were established cannot be stated. In two districts the demarcation and measurement of every holding has been carried out as an experiment. In Coimbatore, where, as a rule, the fields are large, the measure has been successful; in Ganjam it has increased the cost and delayed work to such an extent that, except as regards the thoroughness and perfection of survey accounts thus attained, I should not, under similar circumstances, repeat the experiment."

34. The correspondence from 1855 to 1858, in which the principles and procedure of the present revenue survey and settlement were defined, closed with a decision by the Government of Madras that every field paying revenue should not be separately measured, the great expense of such an undertaking making it impracticable, but that the minimum area larger than a small holding, at which the survey should stop, would be settled hereafter. The extracts in the preceding paragraph confirm the objection taken in 1857 and 1858 to the measurement of every holding on the score of its great expense, and there is the further objection that, as it is difficult to ensure the permanency of the boundaries of each minor field, a costly minute survey of every holding must, in a short time, be obsolete. In the Resolution of the Government of Madras, forwarded with their present Proceedings, it is stated that separate orders have been issued modifying the rules in regard to interstitial fields; but the Government of India will, perhaps, desire to be informed what those orders are, and whether they will effectually remove this serious impediment to the rapid progress of the survey.

35. Having regard to these facts, amended proposals seem necessary by which the increase of revenue from a revision of settlement may be considerably hastened, and the serious expense and the loss of revenue attendant on the prolongation of the work of the Madras Revenue Survey at its present slow pace may be averted. A Madras Revenue Survey party, on the scale proposed, is about 30 per cent. more costly than a cadastral survey party in the North-Western Provinces.

FINANCIAL DEPARTMENT,
24th March 1875.

COPY, with enclosure, forwarded to the Government of Madras, with reference to its letters Nos. 584 and 587, dated the 11th May 1874.

(By Order)

(Signed) C. J. LYALL,
Under-Secy. to the Govt. of India.

*Proceedings of the Madras Government, Revenue Department,
28th May 1875.*

No. 325.

ORDER THEREON, 28th May 1875, No. 832.

Miscellaneous.

COMMUNICATED to the Superintendent
of Revenue Survey for his remarks.

(True Extract.)

(Signed) A. MACGREGOR,
Acting Secretary to Government.

8
832

No. 2117.
GOVERNMENT OF INDIA.
FINANCIAL DEPARTMENT.
Expenditure.

CALCUTTA, the 14th April 1875.

the following letters:—

- No. 1074, dated 17th July 1872, from the Government of Madras, requesting sanction to the employment of a photozincographer on Rs. 150 a month, to be increased after each year of satisfactory service by Rs. 50 a month during the three years for which he was to be engaged.
- No. 498, dated 12th August 1872, from the Government of India in the Revenue Department, stating that the application for a photozincographer would be considered on receipt of a reply to their letter No. 301 of 13th May 1872, regarding the geographical materials available from the Madras Revenue Surveys.
- No. 584 A, dated 11th May 1874, from the Government of Madras, replying to the letter of 13th May 1872, and requesting sanction for an expenditure of Rs. 50,000 a year for a topographical survey party, and of Rs. 13,056 a year for strengthening the compiling and lithographic branches of the Office of the Superintendent of the Madras Revenue Survey.
- No. 587, dated 14th May 1874, from the Government of Madras, forwarding proposals which Colonel Priestley, Superintendent of Revenue Surveys, had submitted in a letter dated 22nd May 1871, for placing the Madras Revenue Survey Department generally on a better footing, the proposals being irrespective of, or additional to, the expenditure of Rs. 63,056 a year, recommended in the letter No. 584 A.

RESOLUTION.—In a memorandum on these proposals, which has been prepared in the Financial Department, various objections have been raised to the expenditure involved, and certain points have been suggested for consideration, respecting the slow progress of the Madras Revenue Survey, the very considerable amount by which the cost of the entire survey and its complement will exceed the original estimate.

2. Without adopting any of the views which are put forward in the memorandum, the Governor General in Council considers that explanation ought to be afforded on the several points raised in it, and that the Government of Madras should state how far the remarks in the memorandum are incorrect, and for the rest, what modifications they have to suggest to remove the objections taken.

ORDERED, that a copy of this Resolution, and of the memorandum of the Financial Department, be sent to the Revenue Department for communication to the Government of Madras.

R. H. HOLLINGBERY,
Asst. Secy. to the Government of India.

30/4/75
23-9-12 ✓

Madras Revenue Survey.—Communicating to the Superintendent of Revenue Survey, for remarks, endorsement of the Government of India forwarding copy of a Resolution and a Memorandum from the Financial Department regarding the large expenditure involved and the slow progress of the work of the —

MAY
Nos. 324-325.

Bot. of 1875, Madras.

REVENUE.

THE SUPERINTENDENT OF
REVENUE SURVEY.

Dated May 9, 1875.

Recd.

Encl.

Register No. 9703.

INCREASED EXPENSE FOR MADRAS REVENUE SURVEYS.

With the first of their letters dated 11th May 1874, the Government of Madras has forwarded proceedings of the Board of Revenue, No. 1729, dated 2nd September 1873, in which the past work and organization of the Revenue Survey Department are reviewed. Those proceedings quote a letter, No. 1581-45 of 28th July 1872, in which the Superintendent of the Madras Revenue Survey reported on the same subject, but the report has not been submitted.

2. The Revenue Department does not recommend the expenditure of Rs. 50,000 a year for a topographical survey of forest or waste lands which were advisedly omitted by the Revenue Survey Department from its surveys. Accordingly the additions to the Central Office, amounting to Rs. 1,088 monthly, for compiling and mapping the results of the proposed topographical survey, are not required.

3. The proposals submitted in the letter No. 587, dated 11th May 1874, are as follows:—

	Present.		Proposed.		Increase.	Decrease.
	No.	Rs.	No.	Rs.	Rs.	Rs.
I.—Central Office ...		47,232		67,566	20,334	...
Deputy and Assistant Superintendents	25	1,09,200	15	92,400	...	16,800
Sub-Assistants and Boundary Inspectors	10	18,000	15	34,200	16,200	...
		1,74,432		1,94,166	36,534	16,800
II.—Five survey and five demarcation parties, exclusive of officers ...		4,31,870		4,66,440	34,570	...
Stores, contingencies, temporary establishments, travelling allowances, &c.		1,34,400		90,150	...	44,250
Half a survey and half a demarcation party		87,293-8		68,319	...	18,974-8
		8,27,995-8		8,19,075	71,104	80,024-8
					Decrease ...	8,920-8

The net increases of Rs. 19,734 in the first section on account of pay for European supervision, and Rs. 34,570 in the first item of the 2nd section on account of the pay of subordinate establishments, are set off, principally, by a reduction of expense on account of stores, measurers, coolies, batta, travelling allowance and contingencies. But savings in these items, which, by reason of their

uncertain fluctuating character, are not securely limited within a sanctioned scale, are not regarded as a set-off to an increase of salaries and establishments, while the reduction of Rs. 13,020, which is proposed in the charge for duffadars, peons, measurers, &c., is for kinds of establishments that are supplemented by temporary establishments.

4. The sum of Rs. 8,27,995-8, which is taken as the present scale of charge, includes credit for the cost of 5½ demarcation parties, whereas the number of such parties as sanctioned and as existing in 1873-74 according to paragraph 12 of the Madras Revenue Board's proceedings, dated 2nd September 1873, and according to the book of establishments dated 1st April 1874, was 2½, shewing an excess credit for three demarcation parties. The annual cost of a demarcation party according to the scale sanctioned in 1866 is Rs. 47,750, and at that rate the excess credit for three parties is Rs. 1,43,250. There is further an excess credit of Rs. 21,253-8 for a half survey party and a half demarcation party;—the cost of these at the rate sanctioned would be Rs. 66,040, whereas credit for them has been taken at Rs. 87,293-8 in the present scale. Thus the aggregate excess credit is Rs. 1,64,503-8, besides another error arising from an excess over sanction in the rate of lumped cost of one survey and one demarcation party.

5. If the excess credit of Rs. 1,64,504 be deducted from the total (Rs. 8,27,996) of the present scale, the sum available for meeting the cost of the revision becomes Rs. 6,63,492 as the total sanctioned cost of the revenue survey, including such demarcation as is under the Superintendent of that survey. The actual expenditure according to the administration reports was Rs. 6,42,221 in 1870-71, (i. e., when Colonel Priestley framed his scheme in May 1871, and yet claimed a credit for Rs. 8,27,996 as present expenditure) and Rs. 6,80,906 in 1872-73. According to the finance accounts the actual expenditure in 1873-74 was Rs. 6,93,570.

6. Instead, then, of a saving of Rs. 8,920-8 (paragraph 3 of this Memorandum), the proposals submitted in the letter of the Madras Government No. 587, dated 11th May 1874, involve an increase of Rs. 155,583,—exclusive of minor excess credits not thrown out of the present scale, and after allowing credit to the revised scale for the large illusory saving in contingencies, and in subordinate fixed establishments of kinds that are supplemented by temporary establishments outside any sanction of a scale of fixed establishment. By throwing out these latter savings, the real additional expenditure would be found to exceed two lakhs a year.

7. Besides the illusory saving under contingencies and petty establishments, the greater part of the reduction under assistant superintendents for five survey parties, including demarcation, being in the proportion for each party, of two assistants for survey, and two for demarcation. But, though two assistants were added to the Revenue Survey Department for each of two demarcation parties, on the partial transfer of demarcation work from the Settlement Department to the Survey Department in 1865, yet the addition of the second officer for each of the parties was erroneous, only one assistant having been allowed in the complement of a demarcation party when it was under the Settlement Department; and in 1873-74, only one assistant was retained for each party. Accordingly with the two demarcation parties of full strength which were maintained in 1873-74, there were only two assistants, while credit has been taken for four, showing an excess credit of two assistants for the two demarcation parties of full strength, actually maintained. Besides this, there is an excess credit of six assistants, thus making an aggregate reduction of eight assistants out of the gross decrease of ten assistants, which is shewn in the proposition statement. The nominal reduction of the cost of eight assistants is Rs. 28,800 a year for pay and Rs. 7,200 for travelling allowance. If the nominal reduction of Rs. 28,800 in pay of eight assistants be deducted from the gross credit, in the present scale, of Rs. 1,09,200 for twenty-five deputies and assistants, the sum to be set against the revised charge of Rs. 92,400 for fifteen deputies and assistants becomes Rs. 1,400, or an increase of Rs. 12,000 instead of a decrease of Rs. 16,800.

8. This increase of expense for fifteen deputies and assistant superintendents would occur from a revision of the pay of those grades which is proposed as follows:—

	A. Existing Staff pay.	B. PROPOSED PAY.			Rate at which cost has been reckoned in scheme.	BENGAL SCALE OF 1866.	
		Staff, exclusive of Military pay.	Maximum for Military Officers.	Civil Officers.		Maximum for Military Officers.	Consolidat- ed for Civil Officers.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Deputy, 1st grade ...	500	800	1,600	1,100	790	1,800	1,100
" 2nd " ...		650	1,300	900		1,400	900
" 3rd " ...		650 C	1,150	700		1,200	700
Asst. Supdts., 1st grade ...	350	Not stated in the scheme.			450	750	500
" 2nd " ...	250					300	350

A.—This is the entire remuneration for civil officers, with the exceptions stated in paragraph 18 of the office note: military officers get military pay of rank in addition, irrespective of any such maximum limit as is provided in the revised scale; and both military and civil officers receive a fixed travelling allowance of Rs. 75 a month, in addition, in the grades of deputy and assistant superintendents.

B.—Exclusive of travelling allowance at (not specified) per diem rates under the police regulations.

C.—Perhaps a misprint for Rs. 500.

9. One reason for the revision is that "the cost of supervision, that is, in short, of military officers of high rank, has latterly become so great, that the funds of the Department cannot bear it, more especially as the higher paid military officers, from age and long residence in the country, &c., are, as a rule, less efficient than younger and more active men." This reason however would support a limitation of the emoluments of military officers in the grade of deputy superintendent to a sum less than the total of staff salary, plus military pay in the higher military ranks: whereas on 1st April 1874 there were—

	OLD SCALE OF PAY IN INDIA.			REVISED SCALE.			Maxi- mum.
	Staff.	Pay.	TOTAL.	Staff.	Military pay.	TOTAL.	
	Rs.	Rs. A.	Rs. A.	Rs.	Rs. A.	Rs. A.	Rs.
On furlough { Deputy Superintendent, 1 Lieutenant Colonel.	500	827 14	1,327 14	800	827 14	1,627 14	1,600
In India { Deputy Superintendent, 1 Captain.	500	415 6	915 6	800	415 6	1,215 6	1,600
				650		1,065 6	1,300
				500		915 6	1,150

Instead of reducing these emoluments, as is deemed expedient, the revised scale would give a substantial increase to the only two military deputies in the Department, of whom one was on furlough. Failing this reason, the increase is supported by another reason, viz., that deputy superintendents serve a long time without increase of pay. "Major Hessey, for instance, has served thirteen years in the same grade, and on the same pay. In Bengal he would, for the last seven years, have been drawing Rs. 300 per mensem more than he has done."

10. Another reason for the increase of pay, and for introducing a maximum limit for the aggregate of staff corps pay, plus military pay of military incumbents, is put forward in a representation by a committee of officers, including a military officer of the Department, "bringing to notice the necessity of revising officers' salaries, so that a subordinate may not draw more salary than his official superior: recommend Bengal rates of pay as suitable." Colonel Priestley remarked on this—"That this is necessary, is undeniable. What is referred to is, that a first assistant superintendent, being a captain, draws Rs. 800, and an uncovenanted deputy superintendent placed over him only Rs. 750. * * In like manner, some limit as to the rank, or age, or service

"a mass of work, are but imperfect); and at the same time so to prepare the field sheets, that they can be reduced and printed from direct by the aid of photozincography."

II.—Some sheets may not admit of reproduction by photozincography, and in such cases I propose, by the introduction of a new transfer ink of Lieutenant Abney's, R. E., of the Ordnance Office, Southampton, to make good and cheap copies on transfer or vellum cloth. This process does not require the intervention of a tracing glass and a dark room, to which the majority of errors in copying may be attributed."

III.—By these processes the labor of mapping will "be reduced to a minimum, and Government may be supplied with copies of these valuable cadastral field maps for from $3\frac{1}{4}$ annas to $4\frac{1}{2}$ annas per imperial sheet containing 1,250 acres."

IV.—According to the "Manual of Surveying for India," published in 1851, page 522, "the pergunnah map on the one-inch, and the village map on the four-inch scale (or that of the revenue survey, Bengal) form the only returns for the Surveyor General required of surveyors, with the exception of an *index sketch*, or outline of the several circuits surveyed during the season, which is given on a scale of *four miles to the inch*. This is intended as a mere guide to the compiler, and explanatory of the annual report. The utmost care is required in the preparation of the pergunnah plans on a scale of *one inch to the mile*." This latter map, so troublesome to prepare, is no longer required from a revenue survey party. During 1873 a considerable change has been made in the mode of preparing maps for publication on the scale of one mile to the inch, whereby executive officers have been relieved of the pentagraphing and preparation of the one-inch general mapping which so heavily taxed their resources, and have been left free to devote their time and means, thus saved, to the better perfecting and examination of the village atlas sheets and computations for the head office."

19. The propositions of the Madras Government include additional charge for strengthening the central office, and each survey party, for the work of compiling, drawing, and copying maps. The preceding extracts show how the work under all these heads, both in the central office and in the offices of executive officers in charge of survey parties, has been, and is being, reduced, by utilising to the utmost the process of photozincography and the new transfer ink invented by Lieutenant Abney. Much of this reduction of work was stimulated by the necessity of relieving the cadastral survey parties in the North-Western Provinces of the immense detail of copying maps of "the enormous number of fields" surveyed by them. The pressure on the Madras revenue surveys is of the same character and extent, and it apparently admits of a like remedy.

20. The several scales of mapping required in the Survey Department, Bengal Presidency, are—

1. General maps, eight or sixteen miles to the inch, for forming maps of provinces.
2. District compilation, usually on the geographical map scale of four miles to the inch (or $\frac{1}{4}$ inch = 1 mile) prepared from No. 3.
3. One inch to a mile, rendered by topographical surveys, and 4 inches to the mile, rendered by revenue surveys.
4. Sixteen inches to a mile, rendered by the cadastral surveys in North-Western Provinces.

In Bengal 1 and 2 are prepared in the central office, and 3 and 4 by the survey parties. In the Madras Presidency No. 2 is to be prepared in the central office, but it is not finished for any one district. Taluk maps on the scale of two inches to the mile take the place of No. 3, and they are prepared by the survey parties; so that as No. 2 is likely to remain unfinished, there is but little work of compilation in the central office; its duties, as stated by the superintendent, "are chiefly those of check and control," that is, testing and re-computing about 20 or 25 per cent. of the area lists submitted by the survey parties. In the memorandum of 22nd May 1871, it is stated that "some work at present performed in the district survey offices ought to be transferred to the central office as, for instance, the compilation of taluk maps."

21. For this compilation of taluk maps in the central office there is proposed the increase of establishment which forms items 1 and 2 in section I of the table in paragraph 16,—viz., in the drawing and lithographic departments to the amount of Rs. 6,702 for, principally, draftsmen, tracers, and examiners, and in the general branch to the amount of Rs. 12,600 for, principally, two civil assistants, obtained by transfer from the field parties, and for three other civil assistants, converted into such from head assistant, office assistant, and head draftsmen, for, manifestly, the supervision and conduct of the compilation of taluk maps from the village maps.

22. If the Bengal plan were to be followed, the original of the village maps by the survey parties would be prepared with sufficient care, accuracy, and neatness, to admit of a copy being printed from them direct by the photozincographic process; the surveying party would be relieved of the fair copying, and of the trouble of making a second and third copy for, it is believed, the collector and the Settlement Department; while the central office would reduce, from the village to the taluk scale, through the photozincographic process, more expeditiously, and with less trouble and expense, than under the arrangement proposed by the Madras Government. The main requisite is the ability of the draftsmen or surveyors with the survey parties, to prepare the original map with sufficient accuracy and neatness to admit of printing from it direct by the photozincographic process.

23. The bulk of the increased expense proposed for a survey party is under the head of deputy and detail surveyors, and gomastahs, draftsmen, and computers. The additional annual charge under this head is Rs. 93,720 for four parties, or Rs. 18,744 for each party. It is explained that "it has hitherto, as a rule, been found that field work outstrips the processes performed in office (plotting, drawing, and computing). Hence it has been deemed advisable to strengthen the establishment of computers and draftsmen." This object will commend itself to the Government of India, especially when the slow progress, hitherto, of the revenue survey and settlement in the Madras Presidency is considered. But expedition is more likely to be ensured by utilising, to the full, improved mechanical processes, as in Bengal, than by simply enlarging establishments which are, perhaps, already overgrown. The Madras revenue survey parties do the same work as the cadastral survey parties in the North-Western Provinces, excepting that demarcation work for these latter is done by the Settlement Department, while a Madras revenue survey party does its own demarcation. The average cost of a cadastral survey party in the North-Western Provinces in 1872-73 was for—

	Rs.
Professional survey, including officers	61,224
Cadastral or field surveys on the Madras scale of sixteen inches to the mile	25,654
	<hr/> 86,878

According to the present proposals of the Madras Government, the cost of a Madras revenue survey party will be Rs. 1,36,638; but this includes demarcation, which, on the old scale, cost Rs. 20,014. In the revised scale a saving has been effected in this old charge for demarcation; accordingly if Rs. 20,014 be deducted from Rs. 1,36,638, the residue, Rs. 1,16,624, will somewhat understate the proposed cost of a Madras revenue survey party, excluding demarcation. This sum is Rs. 29,746 dearer than the cost of a corresponding party in the North-Western Provinces. The outturn of a cadastral survey party in the North-Western Provinces, with a field season of only seven months, is about 600 square miles, which, for five and a half parties, would give 3,300

"of military men in the Department, is desirable, inasmuch as one military deputy superintendent will draw more than double the monthly pay of an uncovenanted officer of the same grade and of longer service in the Department."

11. The revised pay proposed for military officers as assistant superintendents is not given, however; on the existing scale they draw, as staff pay, the full civil pay of an uncovenanted assistant superintendent, and military pay of rank in addition: if it be intended that they should similarly draw revised civil pay of an assistant *plus* military pay of rank, the amount for the several military officers who are assistants, will be as follows:—

	OLD SCALE OF PAY.			REVISED SCALE.		
	Staff pay.	Pay.	TOTAL.	Staff.	Mily. pay.	TOTAL.
	Rs.	Rs. A. P.	Rs. A. P.	Rs.	Rs. A. P.	Rs. A. P.
1st Assistant Superintendent, 1 Captain	350	374 1 0	724 1 0	450	374 1 0	824 1 0
2nd Ditto ditto 1 "	250	415 6 0	665 6 0	300	415 6 0	715 6 0
" Ditto ditto 1 "	250	374 1 0	624 1 0	300	374 1 0	674 1 0

According to paragraph 8, the revised salary proposed for an uncovenanted deputy superintendent, 3rd grade, is Rs. 700, which is less than the existing emoluments of a military assistant superintendent, 1st grade, and slightly more than those of a military assistant, 2nd grade. Either, therefore, the limitation to be imposed on the staff salary, *plus* military pay, of military assistants should reduce that aggregate considerably, or the salaries of civil officers must be raised still further.

12. The latter alternative would be forced on the Government were the principle of the scheme to be accepted; for that principle is to extend the Bengal rates of pay to the officers of the Madras revenue survey, with only a lower maximum, than in the Bengal scale of 1866, for the staff salary *plus* military pay of military incumbents. But the Bengal rates which, with the above modification, the Madras committee and Colonel Priestley recommended, are those sanctioned in 1866, which were in force in 1871 at the date of Colonel Priestley's proposals. These rates, however, are to give place to consolidated salaries, which if finally sanctioned, will compare as follows with Colonel Priestley's revised scale, *viz.*:—

	BENGAL SURVEY DEPARTMENT.			COLONEL PRIESTLEY'S REVISED SCALE.		
	Former rate for		New consolidated pay for Military and Civil.	Military officers.	Maximum of aggregate Military emoluments.	Civil for uncovenanted officers.
	Military officers.	Civil.				
	Staff pay.			Staff pay.		
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Deputy Superintendent, 1st grade	A		B			
Ditto ditto, 2nd "	800	1,100	1,600	800	1,600	1,100
Ditto ditto, 3rd "	650	900	1,300	650	1,300	900
Assistant Superintendent, 1st grade	500	700	1,000	C 650	1,150	700
Ditto ditto, 2nd "	375	500	750	450		450
Ditto ditto, 3rd "	250	350	600	300		300
	150	250	500			

A.—Besides military pay of rank.

B.—Besides old net military pay for officers of royal engineers.

C.—Apparently a misprint for Rs. 500.

13. Colonel Priestley's maximum which is to limit the aggregate of staff pay, *plus* military pay, for military incumbents, is the same as the new consolidated pay in Bengal for deputy superintendents, 1st and 2nd grades, while it is more than the latter for a 3rd grade deputy. On the other hand, Colonel Priestley's scale for uncovenanted officers is considerably less than the Bengal scale. If therefore the principle of Colonel Priestley's revision be accepted,

namely, that the Madras scale should be assimilated generally with the Bengal scale, and that uncovenanted officers should not get less than military officers in junior grades of the Department, there would be a liability for an increase of cost for civil officers, beyond that which is estimated by Colonel Priestley, and for an immediate increase, for military officers, to Colonel Priestley's maximum.

14. The existing staff pay of deputy superintendents is Rs. 500, and out of five deputies, four are civil officers, and one a staff corps officer on furlough, in whose room another military officer is acting as deputy. If the title of military officers, in the grade of deputy, to a staff pay of Rs. 500 rising to Rs. 800, besides staff corps pay, be recognised, then the executive engineers, 1st grade, in the Madras Presidency, who received a staff pay of Rs. 600, and who are now limited to a consolidated salary of Rs. 950 monthly (besides net military pay of rank for royal engineer officers), will consider themselves underpaid—especially if the revised pay for uncovenanted officers of the Survey Department in Bengal be finally sanctioned and extended to the similar officers in the Revenue Survey Department, Madras.

15. The assistants in the Settlement Department receive the same pay as those in the Revenue Survey Department, and any increase of the pay of the latter will have to be given to the former.

16. Considering the extensive disturbance of the general scale of salaries which might follow the revision of the pay of the officers of the Madras revenue survey, especially on a principle of assimilation with the Bengal scale, and that the amount of increase proposed is large, compliance with the proposal of the Madras Government seems inexpedient.

17. It is proposed to add so much as Rs. 20,234, or more than two-fifths of present charge, to the cost of a central office which controls operations of survey parties whose annual output of work since 1865-66 has been very much less than it was down to 1864-65, as follows, *viz.*:—

	No. of parties.	Square miles.		No. of parties.	Square miles.
1861	5	4,260	1868-69	5½	2,264
1862	5	4,992	1869-70		3,517
1863	5	4,764	1870-71		3,578
1864	5	3,338	1871-72		3,132
1865	5	2,956	1872 (to 31st Dec.)		2,499
1866	5½	2,720			
1867-68	5½	2,687			
" (3 months)		389			

18. In support of a further small expense for a photozincographer, it is urged that photozincographic establishments are allowed for the Survey Departments in the Bengal and Bombay Presidencies. In Bombay an assistant superintendent of survey on Rs. 800 a month is in charge of the photozincographic office at Poona. In Calcutta a still better paid assistant surveyor-general is in charge; and in Dehra Doon one of the officers on the staff of the Superintendent, Great Trigonometrical Survey, has charge. The present application is therefore, probably, the mere beginning of a larger expenditure. In Calcutta the expense of the office has, perhaps, been more than covered by arrangements for reducing the work of survey parties. Colonel Gastrell writes as follows, in the report on the operations of the revenue survey for 1872-73, in respect of cadastral surveys:—

I.—"My most serious attention has been given during the year
 "to the best mode of reducing the strain on the survey
 "office which such a vast number of small field surveys necessarily involves, especially in securing copies of the maps,
 "without errors in field boundaries, or in numeration of fields:
 "and I hope by the introduction of carbonic tracing paper in
 "making copies for the settlement officer to ensure a *fac-simile*
 "copy simultaneously with the inking in of the original field
 "plan, and by so doing entirely save the enormous labor now
 "involved in making final comparisons (which, at best, with such

square miles. The outturn of five and a half Madras survey parties, with a field season of ten months, was 2,969 square miles in the years from 1866 to 1872. In 1871-72 it was 3,132 miles, and the Superintendent of the Survey promises an increase; but still the difference in annual cost is considerable, the Madras party being 30 per cent. more expensive than the North-Western Provinces party, even after accepting for the latter the present expensive organisation, which Colonel Walker is evidently of opinion can be cheapened with an improvement in efficiency, that is, in annual outturn.

24. The expectation that a Madras revenue survey party, if re-organised in the manner proposed, will work more rapidly seems illusory. It is proposed that the two and a half demarcation parties now attached to that number of survey parties, but under separate assistant superintendents, shall be amalgamated with the latter, so as that the same men shall demarcate and do the interior survey. At present in one season a demarcation party under an assistant superintendent gets through the demarcation of sixty villages in one taluk, while the revenue survey party under its officers gets over other sixty villages in another taluk. Yet it is expected that when the establishments are united and concentrated for work in the same taluk in reduced strength, with one assistant less, the distinct operations of demarcating and of interior survey, and of settling boundary disputes—which last owing to the litigation involved is a tedious business (*Memo. by Director of Revenue Settlements dated 14th October 1873*)—will be got through in ninety to a hundred villages. The anticipations of the Revenue Survey Department have not been realised in the past; and the outturn of its survey parties has been less since demarcation work was made over to it, even with separate demarcation establishments, than the outturn it gave until the year 1865 when demarcation was done by the Settlement Department. This is apparent from paragraph 17 of this memorandum and from the remark of the Director of Revenue Settlements, that 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.”

25. The expectation of rapid work is indeed modified in the statement that “instead of six or eight years elapsing between the commencement of demarcation and completion of survey, it would be possible to prepare a taluk for settlement in two years at the latest; that is to say, that an uninterrupted supply of survey areas could by that time be depended on.” The eight districts, omitting Ganjam, in which surveys are in progress, viz., Cuddapah, Coimbatore, Tinnevely, Chingleput, Nellore, Ganjam, and the unfinished taluks in Kurnool, contain sixty-eight taluks, giving an average of eight and a half taluks per district: an entire district would thus be prepared for settlement in seventeen years.

26. The slow progress of the Madras revenue survey implies a considerable loss of revenue, superadded to heavy expense; and perhaps it will be held that the facts relating to it cause grave anxiety. Since 1858, when the survey work was estimated at 60,000 square miles, North Canara has been transferred to the Bombay Presidency, and it has been decided that a revenue survey is not required for two years more than the fourteen originally fixed; while they extend five years beyond the term of eight years in which, as afterwards reported by the Madras Government in November 1861, they were confident that the work would be finished with the enlarged establishments given in 1860. The work which has been done is as follows:—

	Estimated total work.	Actually surveyed.	Remaining to be surveyed.	Proportion finished.
	Square miles.	Square miles.	Square miles.	Per cent.
Revenue survey	55,032	36,385	18,647	66
Topographical	52,783	11,428	41,355	21.7
	107,815	47,813	60,002	

And the cost has been as follows:—

	Square miles.	Total cost.	Cost per square mile.
		Rs.	Rs. A. P.
Revenue survey, 16 inch=1 mile...	36,111	55,37,012	153 5 3
Topographical, 4 and 2 inch=1 mile	14,340	2,31,613	20 6 9
	47,451	57,68,625	121 9 1
Special surveys, 16 and 4 inch=1 mile	362	5,68,381	1,570 1 10
TOTAL	47,813	63,37,006	132 8 7

The rate of Rs. 153 per square mile for the revenue survey is exclusive of that for demarcation, which, as effected by the Survey Department, has involved a separate charge of Rs. 56 per square mile, or a total of Rs. 209 per square mile. The original estimate was Rs. 55 for survey and Rs. 10 for demarcation; total Rs. 65, against an actual of Rs. 209 per square mile.

27. According to a report submitted by the Madras Government in August 1867, supplemented by such information as can be gathered from the pretty full details in the administration reports of the Madras Presidency, it appears that only five districts have been settled since 1858, and these were settled—one in 1860-61, two in 1866-67, and one in each of the next two years. Since 1868-69, not another district has been entirely settled, though portions of districts have been settled, the explanation, apparently being that “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 have been increasingly transferred, thereby bringing up the establishment and expenditure in the Survey Department to their present standard; and, as already explained, topographical 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 revenue survey establishment and expenditure to those more general objects, which accounts, in some measure, for the increasing degree in which the survey lags behind the urgent needs of the Revenue Settlement Department.”—(*Colonel Priestley, 12th June 1873.*)

28. It was estimated in 1858, that four survey parties on the limited scale then sanctioned would give an outturn of 4,400 square miles per annum. But in 1860 the survey parties were enlarged for providing an outturn of 1,400 square miles for each party, or of 7,000 square miles for five parties, or 7,700 square miles for five and a half parties. From 1861 to 1865 there were five parties, and during that period they were not encumbered with demarcation; yet the average annual outturn was barely 4,000 square miles: from 1866, when the survey department got encumbered with demarcation, it has been less than 3,000 square miles for five and a half parties, or say 3,000 square miles, against a proper outturn of 7,700 square miles.

29. In 1858 the annual scale of expenditure for the larger outturn was fixed at Rs. 5,47,616, giving for fourteen years, in which the work in nineteen districts was to be completed, Rs. 76,66,624, and this estimate was re-affirmed by the Madras Government in 1861. At the present day the outlay is at the rate of nine and a half lakhs a year, but with an outturn of only 3,000 square miles a year, and with settlements finished in only five districts, and the entire work may not be completed for less than two crores.

30. This failure in outturn has occurred in spite of a contraction of the original plan of detailed survey. The Madras Government recorded on 12th December 1864, that “under existing rules the survey extends to all land usually cultivated, all that has ever been cultivated, and such land, not included in these classes, as may seem likely to be brought under the plough on the extension of cultivation, consequent on lighter assessments, and on an improved revenue system. The disadvantages attending this rule are, that a considerable area is surveyed at a heavy cost in time and money

"which may not be cultivated for years, and which may not even then be taken up in the blocks in which it is laid down in the survey. It will often happen that, however well the survey officers may lay out the fields, these may not suit the convenience or means of the ryots, and the Government are in the dilemma of compelling the ryots to adopt their holdings to the arbitrary arrangements of the surveyor, or of losing the advantages of the survey. Moreover, it is practically almost impossible to preserve boundary marks in waste land. The Government think it advisable to limit the detailed survey to the land actually occupied, and such adjacent tracts as, from their position, &c., are likely to be cultivated within two or three years, the latter being surveyed in blocks of about ten acres in dry and four acres in wet land."

31. The original plan of survey having been thus contracted, progress should have been accelerated, whereas now the outturn from five and a half parties is smaller than that obtained, until 1865, from five parties. Apparently this retardation of work where accelerated progress was to be expected is due to three causes, *viz.*,—1st, the transfer of demarcation work from the Settlement to the Survey Department; 2nd, the employment of portions of the revenue survey parties on non-revenue paying portions of some districts, while revenue paying parts of other districts are awaiting survey and settlement; 3rd, the immense detail work of measuring minor fields within survey fields. The first cause of delay has been noticed in paragraph 17 of this memorandum. The second cause is avoidable; for the permanency of the survey in revenue paying parts of districts being secured by permanent boundary marks, it can make no difference, in the long run, as to the time for completing the survey of the entire presidency, if the revenue paying portions be finished first and those which do not pay revenue, or which are not likely to pay revenue within two or three years, be finished afterwards; while it must make a great difference in the financial result if the increase of revenue from revised settlements be delayed by giving precedence to topographical survey work.

32. Moreover, as reported by Colonel Walker, accurate surveys of the greater parts of the Madras Presidency for incorporation in the Indian Atlas already exist; while the Surveyor General of India, so far as he has hitherto reported, is averse from accepting for the Indian Atlas any compilations from the Madras revenue survey which he is not in a position to verify.

33. The third cause of delay is the survey of interstitial fields. Respecting these the Director of Revenue Settlements, Mr. Banbury, observes that "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." And Colonel Priestley remarks that "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 some districts these fields have been measured by the Survey Department after the close of their own special work, and the cost has been in consequence excessive. Again, these measurements have been in other districts made by the Settlement Department, but with what result is not known. The cost of the process has been less; but whether sufficient checks to secure trustworthy measurements were established cannot be stated. In two districts the demarcation and measurement of every holding has been carried out as an experiment. In Coimbatore, where as a rule the fields are large, the measure has been successful; in Ganjam it has increased the cost and delayed work to such an extent that, except as regards the thoroughness and perfection of survey accounts thus attained, I should not, under similar circumstances, repeat the experiment."

34. The correspondence from 1855 to 1858, in which the principles and procedure of the present revenue survey and settlement were defined, closed with a decision by the Government of Madras that every field paying revenue should not be separately measured, the great expense of such an undertaking making it impracticable, but that the minimum area, larger than a small holding, at which the survey should stop, would be settled hereafter. The extracts in the preceding paragraph confirm the objection taken in 1857 and 1858 to the measurement of every holding on the score of its great expense, and there is the further objection that as it is difficult to ensure the permanency of the

boundaries of each minor field, a costly minute survey of every holding must, in a short time be obsolete. In the Resolution of the Government of Madras forwarded with their present proceedings, it is stated that separate orders have been issued modifying the rules in regard to interstitial fields; but the Government of India will perhaps desire to be informed what those orders are, and whether they will effectually remove this serious impediment to the rapid progress of the survey.

35. Having regard to these facts, amended proposals seem necessary by which the increase of revenue from a revision of settlement may be considerably hastened, and the serious expense, and the loss of revenue, attendant on the prolongation of the work of the Madras revenue survey at its present slow pace may be averted. A Madras revenue survey party, on the scale proposed, is about 30 per cent. more costly than a cadastral survey party in the North-Western Provinces.

FINANCIAL DEPARTMENT,
24th March 1875.

*Increased expense for Madras Revenue
Survey.*

Rev 1944/75

Rev: 1875: Sept
N 1944

From

The Under Secy to the
Min^r of Lands
Dept. of River &
N 342

Dated 15th } May /75
Recd 24th }

C-1

N 342

Department of Revenue, Agriculture and Commerce.

Simla, 15th May 1875.

Copy, with enclosure, forwarded to the Government of Madras with
reference to its letters No 587, and 589 dated 11th May 1874.

By order,

Wm. H. Hall

Under Secretary to Govt. of Madras.

For copy of a Resolⁿ and of
Memorandum of the Min^r of Lands, calling various
statements as to the large expenditure involved, and suggesting
certain points for consideration respecting the slow progress of
the Survey, and the former calling for explanation
on the several points raised in it, and as to how far the
remarks made in it are incorrect and as to what modifications
can be suggested to remove the objections taken.

N 832
Cm^r to be kept,
Rev. Survey, for his remarks

28 May 75. H—
24/5/75

14 To the Secy of Rev Survey &c. 14 June