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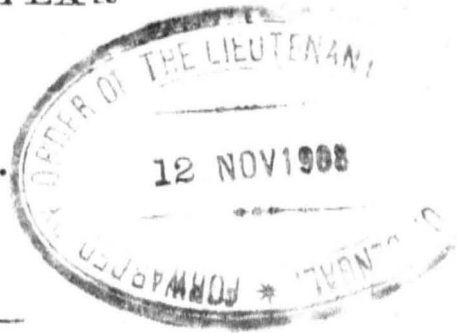
ANNUAL REPORT

ON THE

SURVEY OPERATIONS IN BENGAL

DURING THE YEAR

1906-07.



From 1st October 1906 to 30th September 1907.



Calcutta:

THE BENGAL SECRETARIAT BOOK DEPÔT

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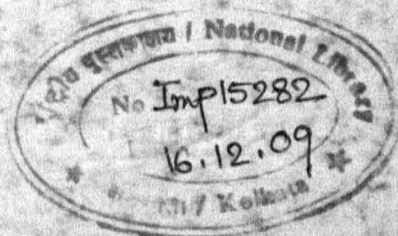
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INDEX TO CONTENTS.

CHAPTER I.

GENERAL REMARKS ON PROVINCIAL SURVEYS	PAGE. 2
---	---------

CHAPTER II.

PART I.—REPORTS ON SURVEYS AND RECORDS-OF-RIGHTS IN TEMPORARILY SETTLED AND GOVERNMENT ESTATES UNDER SETTLEMENT OF RENTS AND LAND REVENUE.

Nil.

PART II.—REPORTS ON SURVEYS AND RECORDS-OF-RIGHTS IN PRIVATE ESTATES.

BHAGALPUR DIVISION	{	MONGHYR	DISTRICT—TRAVERSE	SURVEY . . .	3
		"	"	CADASTRAL " . . .	3
		"	"	TOPOGRAPHICAL " . . .	3
PATNA	"	... PATNA	"	TRAVERSE " . . .	4
BHAGALPUR	"	... BHAGALPUR	"	CADASTRAL . . .	4
				RECORDS . . .	4
ORISSA	"	... PURI	"	TRAVERSE . . .	4
BURDWAN	"	... MIDNAPORE	"	" . . .	5
CHOTA NAGPUR	"	{ RANCHI	"	" . . .	5
		{ SINGHBHUM	"	" . . .	6
BHAGALPUR	"	... SONTHAL PARGANAS	"	" . . .	6
PRESIDENCY	"	{ 24-PARGANAS	"	" AND TOPOGRAPHICAL .	7
		{ KHULNA	"	" " " . . .	7

PART III.—REPORTS ON MISCELLANEOUS SURVEYS.

	{	BHAGALPUR—COLGONG AND MAWALIKABAD . . .	8
		" AND PURNEA—NEPAL BOUNDARY KOSI DIARA	9
		PURNEA DISTRICT—DIARA VILLAGES . . .	9
BHAGALPUR DIVISION	{	DARJEELING " NEPAL BOUNDARY (MECHI RIVER)	9
		MONGHYR " JAMALPUR MUNICIPALITY . . .	9
		" " BENDA DIARA (CHECK SURVEY) . . .	9
		BHAGALPUR " BHAGALPUR MUNICIPALITY REVI- SION . . .	9
PRESIDENCY	"	—24-PARGANAS—CALCUTTA SUBURBS SURVEY . . .	10
CENTRAL PROVINCES		BILASPUR DISTRICT—UDAIPUR STATE BOUNDARY . . .	10

PART IV.—REPORT ON THE BENGAL DRAWING OFFICE.

STANDARD MAPPING SECTION	12
TRAVERSE CHART SECTION	13
TRIUNCTION MARKS AND THANA MAPPING SECTION	13
REPRODUCTION OF VILLAGE MAPS SECTION	13
BADAR SECTION	16
MAPS RECORD SECTION	16

CHAPTER III.

PART I.—TOURS OF THE SUPERINTENDENT OF PROVINCIAL SURVEYS	PAGE.
„ II.—SERVICES OF OFFICERS	17

LIST OF APPENDICES.

APPENDIX I.—PART A.—SUMMARY OF OUTTURN OF WORK	13
„ PART B.—STATEMENT OF OUTTURN AND COST RATES	19
„ II.—EXPENDITURE STATEMENT	20

LIST OF INDEX MAPS.

PROVINCE OF BENGAL	To face page	1
MONGHYR DISTRICT	„	3
PATNA	„	4
BHAGALPUR	„	4
PURI	„	4
MIDNAPORE	„	5
RANCHI	„	5
SINGHBHUM	„	6
SONTHAL PARGANAS	„	6
24-PARGANAS	„	7
KHULNA	„	4
PANCHANNOGRAM	„	10

ANNUAL REPORT
OF
THE SUPERINTENDENT OF PROVINCIAL SURVEYS, BENGAL
ON THE
SURVEY AND RECORDS-OF-RIGHTS OPERATIONS IN BENGAL
DURING THE SURVEY YEAR 1906-1907.

No. $\frac{4421}{R.7-121}$

FROM CAPTAIN F. C. HIRST, I.A.,

Offg. Superintendent of Provincial Surveys in Bengal,

TO THE SECRETARY TO THE BOARD OF REVENUE, LOWER PROVINCES.

Dated Hazaribagh, the 26th December 1907.

SIR,

I HAVE the honour to submit my Report on the Survey Operations in Bengal during the past survey year from 1st October 1906 to 30th September 1907.

2. Major R. T. Crichton, the incumbent of the appointment I am officiating in, held charge until March 28th 1907, when he went home on long leave in very indifferent health. Since that date I have held charge myself.

CHAPTER I.

GENERAL REMARKS.

3. The outturn for the year, viz., 275 square miles of triangulation for topographical work, 6,309 square miles of Traverse Survey, 1,709 square miles of Cadastral Surveys, 1,872 square miles of Record Writing and 1,591 square miles of Topographical Survey is in each item in excess of that reported last year. The full programme has been worked up to, and it has been sometimes slightly exceeded; one case of apparent failure, viz., the Topographical Survey of a block of hills in the south of the Monghyr District is not really what it appears to be; it was decided at a somewhat late date to cadastrally survey this area, with the result that men who were expected to be used on Topographical work had to be utilized for Traverse survey.

Changes during the year.

(a) The final handing over of cadastral work in Bengal to the Settlement Department has been accomplished; No. 4 Party (Bihar) has been broken up, and its two cadastral sections transferred, almost bodily, to the executive control of the Settlement Officer, Bihar. This change takes effect from the first day of the survey year 1907-08.

(b) The Settlement Department has, so far, been compelled to use rough 4" plots as the basis of thana maps; finding this to be the case I have altered the procedure so that in future the Settlement Officer will have a sufficiently accurate basis for Thana Maps.

(c) By order of the Surveyor General all the records (sets up) of Traverse work, after completion, have been copied so that each Settlement Officer may receive a copy for his own use, and so that, on the completion of the Settlement Operations in any district, the local authorities will have a complete record of Traverse work done; another reason for the necessity of this procedure is that the Topographical Surveyors, who will eventually revise or resurvey areas covered in Revenue Operations, may have, at any time, all the records which they may require; to accomplish this, extra work has been thrown on Traverse sections, but when the resulting advantages are considered, the slight extra cost involved is of little importance. No harm can ever come from duplicate copies of important records being kept in separate places and, provided that the cost of producing duplicates is not excessive, it will generally be admitted that their provision is advisable.

(d) The professional control of Bengal Surveys has, from the 1st September 1907, been transferred from the Deputy Surveyor General to the Surveyor General.

(e) My office work has increased to a great extent; this is due to the control of the Surveys of this Province and the transferred districts of Eastern Bengal being under the same survey officer, who is subordinate to two Boards of Revenue; the partition caused an immediate duplication of all reports and returns, and now, as changes in procedure in both Provinces occur, since these seldom coincide, there is a gradual drifting apart which tends to make my appointment more and more difficult; so far the interests of the two Governments do not conflict, but it is doubtful if they will not do so in the near future.

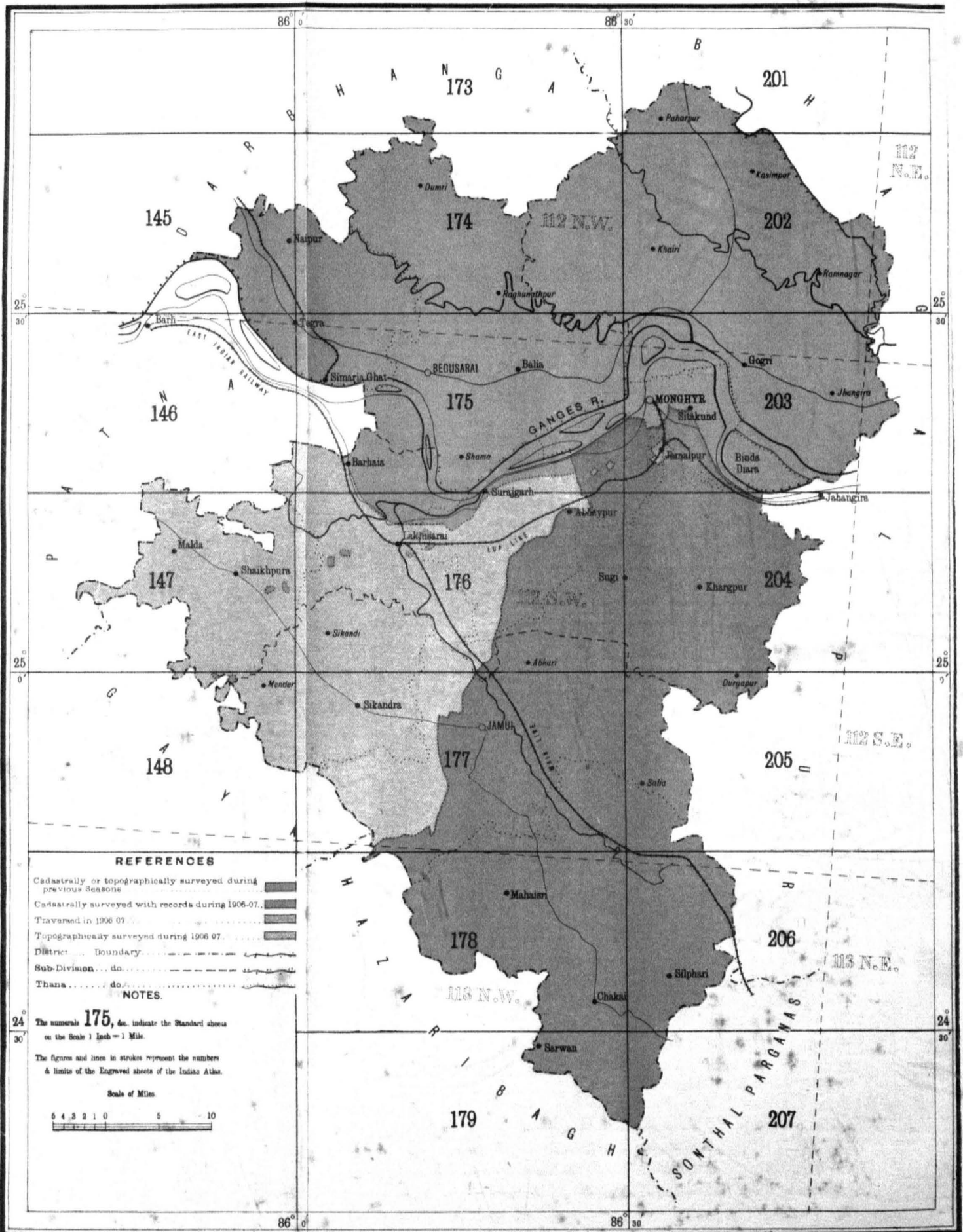
(f) The question of accounts has received much attention during the year; it is proposed to substitute the system of a permanent advance for that of Letters of Credit, it being seldom that a Survey Party in Bengal will be working far from a local treasury. A European Accountant (Mr. Picachy) has been lent me and he has for some months been engaged in framing the rules which it is earnestly hoped will lead to a change of system at the beginning of the next financial year. Mr. Picachy has given me every possible help, and even if the new system is not introduced his suggestions on many points will have facilitated work and reduced considerably the risk there is, under the present system, of loss of Government money.

BENGAL

INDEX TO THE CADASTRAL SURVEY IN DIST. MONGHYR

1906-07.

No. 4 PARTY.



CHAPTER II.

PART I.—REPORTS ON SURVEYS AND RECORDS OF RIGHTS IN TEMPORARILY-SETTLED AND GOVERNMENT ESTATES UNDER SETTLEMENT OF RENTS, AND LAND REVENUE.—NIL.

PART II.—REPORTS ON SURVEYS AND RECORDS OF RIGHTS IN PRIVATE ESTATES.

MONGHYR DISTRICT.

Traverse Survey.

4. THANAS Surajgarha, Sikandra, Sheikhpura and that area of Thana Jamui which remained over from last year, were traversed during the season, the area traversed being 1,190 square miles, which includes an area of 2.65 square miles of scattered Government Estates previously surveyed, but which had to be retraversed. The area also includes 275 square miles of hilly country traversed for cadastral as well and topo purposes (*vide* paragraph 15.)

5. In this area there are 15,284 new theodolite stations of which 1,956 are marked with stones, 12,724 with clay cylinders and 604 with pegs.

6. Three Great Trigonometrical Stations were connected with, and the angular work was checked against the results of 79 azimuth observations. The mean magnetic variation is $1^{\circ} 27' 40''$ East.

7. The demarcation was good and the traverse boundaries agree very well with the Revenue Survey boundaries.

8. The work has been plotted on 1,725 sheets. Where "tola" boundaries were pointed out to the traversers, theodolite stations have been laid down along them and the "tolas" have been plotted separately.

9. The work has proved well mathematically and all the computations are practically complete.

Cadastral Survey.

10. The area cadastrally surveyed and of which the record writing was done was 1,307 square miles; this area includes 157 square miles of the hill block mentioned in paragraph 15.

11. The survey work was checked by 4636 linear miles of test survey which give an incidence of 3.7 linear miles of test survey to every square mile of detail survey.

12. The entries of 256,290 plots were checked by the survey staff which gives an average of 28 per cent of the total number of plots.

13. There were 252 boundary disputes and 38,840 interior disputes, of which 243 of the former and 33,838 of the latter have been decided. The balance will be attended to at the attestation stage.

14. The attendance of the zamindars and raiyats was fair. The average daily outturn per man was in survey 20 acres and in Khanapuri 50 fields.

Topographical Survey.

15. The area triangulated and traversed, a very small part of which was done last season, was 275 square miles. Two secondary and 28 intersected points were fixed, and these, together with the points fixed last season, give 21 secondary and 43 intersected points. The triangulated area includes the block of hills in thanas Monghyr, Jamui, Kharagpur, Surajgarha and Sikandra.

16. In the hill area 1,698 theodolite stations were fixed, all of which were marked by pegs.

The angular work was checked against the results of 4 azimuth observations and the mean magnetic variation is $1^{\circ} 38'$ East.

17. Each block of cultivation in the hills, with one exception, was surrounded by traverse stations and these blocks were connected with the triangulated points. This entailed a great deal of line clearing through jungle. The area of cultivation in the hill block is 12.64 square miles.

18. As the 2" scale survey was not begun till after the cadastral survey of the cultivation was finished, only 51 square miles of 2" work was completed; these have not been taken credit for in this report.

19. The topographical work was tested by 34 linear miles of test lines along which observations for heights were taken. The work proved to be good.

20. All the computations have been completed and the remaining area will be dealt with during the next field season.

PATNA DISTRICT.

Traverse.

21. The area traversed in this district is 851.6 square miles, which includes an area of 21.6 square miles of Government Estates and Tikari villages that were surveyed in previous years.

22. The area comprises Thanas Mokameh, Barh, Bihar and Silao, 1453 villages being traversed in all.

23. 16,165 new Theodolite Stations have been laid down, of which 2,408 are marked with trijunction stones, 13,147 with clay cylinders and 610 with pegs.

24. Six Great Trigonometrical Stations have been connected with and the angular work checked against the results of 62 Azimuth observations. The mean magnetic variation is $1^{\circ}34'$ East.

25. The entire work has been plotted on 1,629 sheets. Where "tola" boundaries were pointed out to the Traversers, the tolas have been traversed and plotted separately. The work has proved well and all the computations are practically complete. The plots have been sent to the Settlement Officer.

26. The origin of the survey is the intersection of Latitude $25^{\circ}30'$, Longitude $85^{\circ}30'$.

27. The demarcation was good, consequently the boundaries according to the traverse survey agree very well with the Revenue Survey Boundaries.

BHAGALPUR DISTRICT.

Cadastral Survey.

28. The area cadastrally surveyed was 375 square miles. The records of this area and of the area 163 square miles cadastrally surveyed last year, but for which records were not written, that is of a total area of 538 square miles were prepared.

29. The survey work was tested by 1,238 linear miles of check survey, which gives an incidence of 3.3 linear miles of test survey to each square mile of detail survey.

30. The entries of 91,956 plots were tested by the survey staff which gives an average of 27 per cent. of the total number of plots.

31. There were 85 boundary and 10,860 interior disputes. Of the former 78 and of the latter 10,310, were decided, the balance have been left for the attestation stage.

32. The attendance of the zamindars and raiyats was only fair. The average daily outturn per Amin in survey was 23 acres and in Khanapuri 51 fields.

PURI DISTRICT.

Traverse Survey.

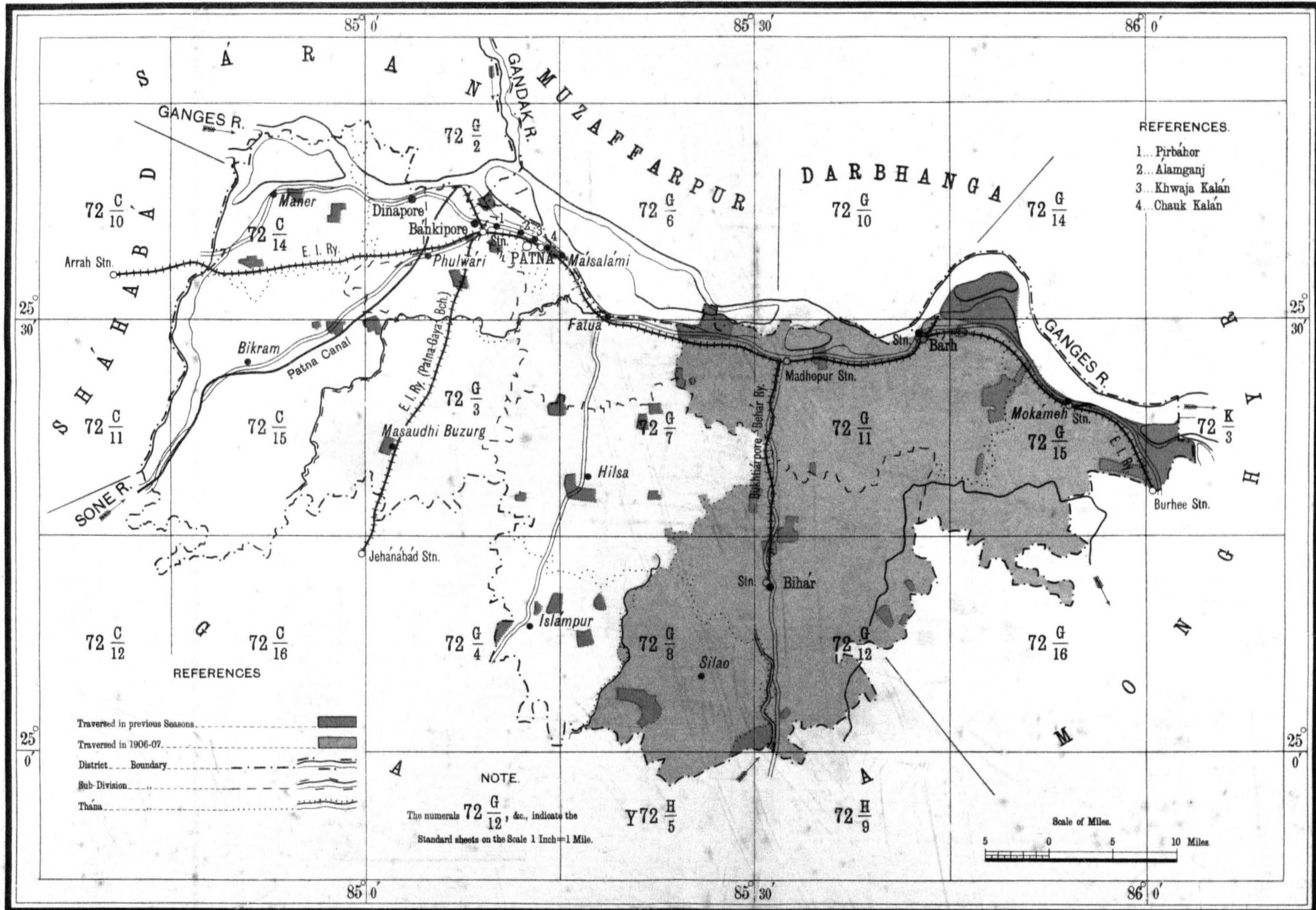
33. The tract dealt with embraced 96.9 square miles lying between the Chilka Lake and the sea, touching, on the west, the Presidency of Madras; the area is low lying and flat and nearly every village encountered is protected by high embankments; the lands surveyed fall in Jagir Mahal lands of Parganas Malud, Parikud, Bajarkot and Mitha Kuan.

BENGAL

1906-07

INDEX to the TRAVERSE & CADASTRAL SURVEYS in DISTRICT PATNA

No. 4 PARTY.

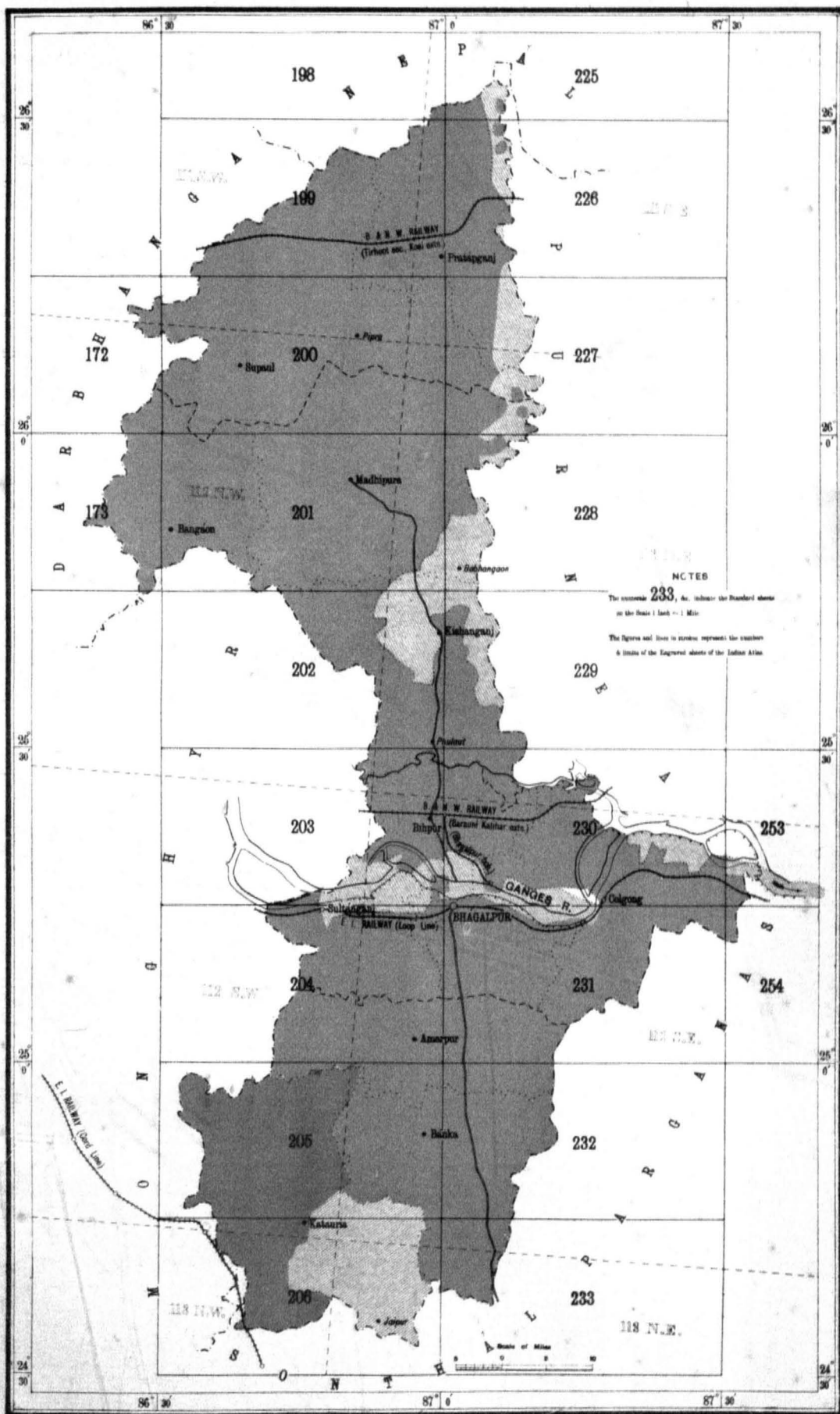


BENGAL SURVEY.

INDEX TO THE TRAVERSE & CADASTRAL SURVEYS IN DISTRICT BHAGALPUR.

1906-07.

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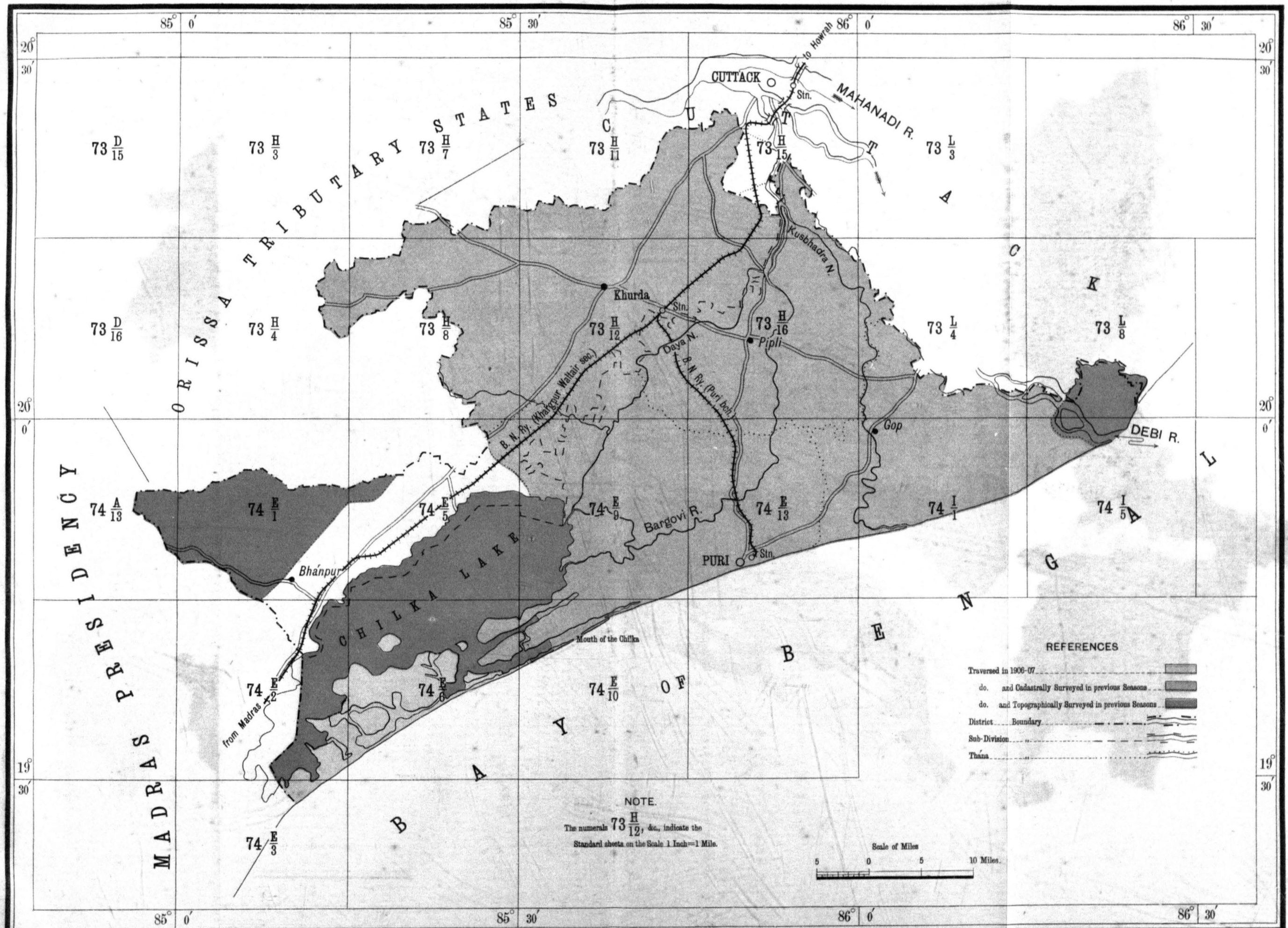


Reg. No. 1216 D., 08.—S I.—525

Helo., S. I. G., Calcutta

REFERENCES.

Cadastrally Surveyed with Records in previous Seasons	
Traversed & Topographically Surveyed 4-inch Scale in previous Seasons	
Cadastrally Surveyed with Records in 1906-07	
Cadastrally Surveyed in 1905-06, records written 1906-07	
District Boundary	
Sub-Division do	
Thana do	

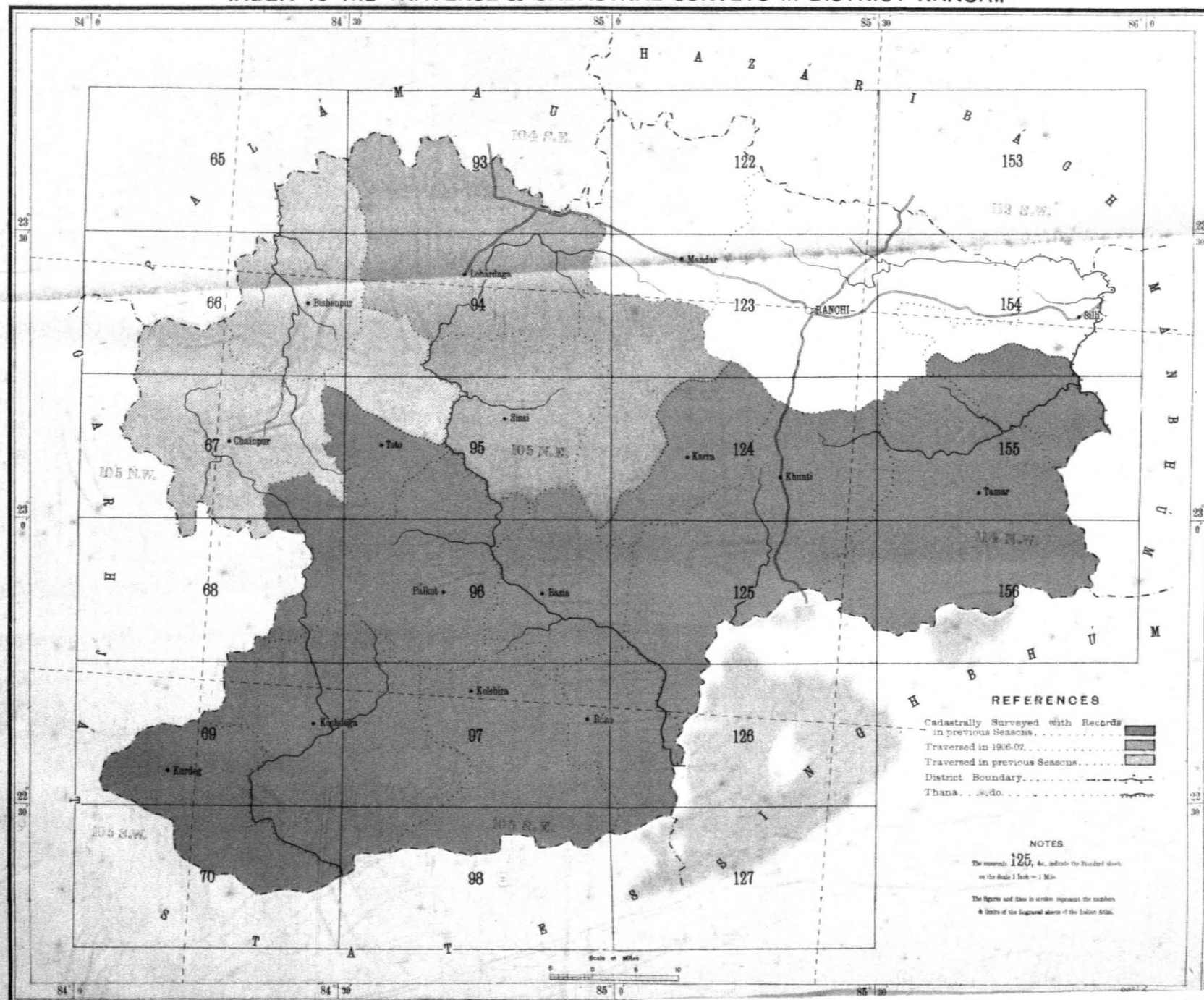


BENGAL SURVEY.

1906-07.

INDEX TO THE TRAVERSE & CADASTRAL SURVEYS IN DISTRICT RANCHI.

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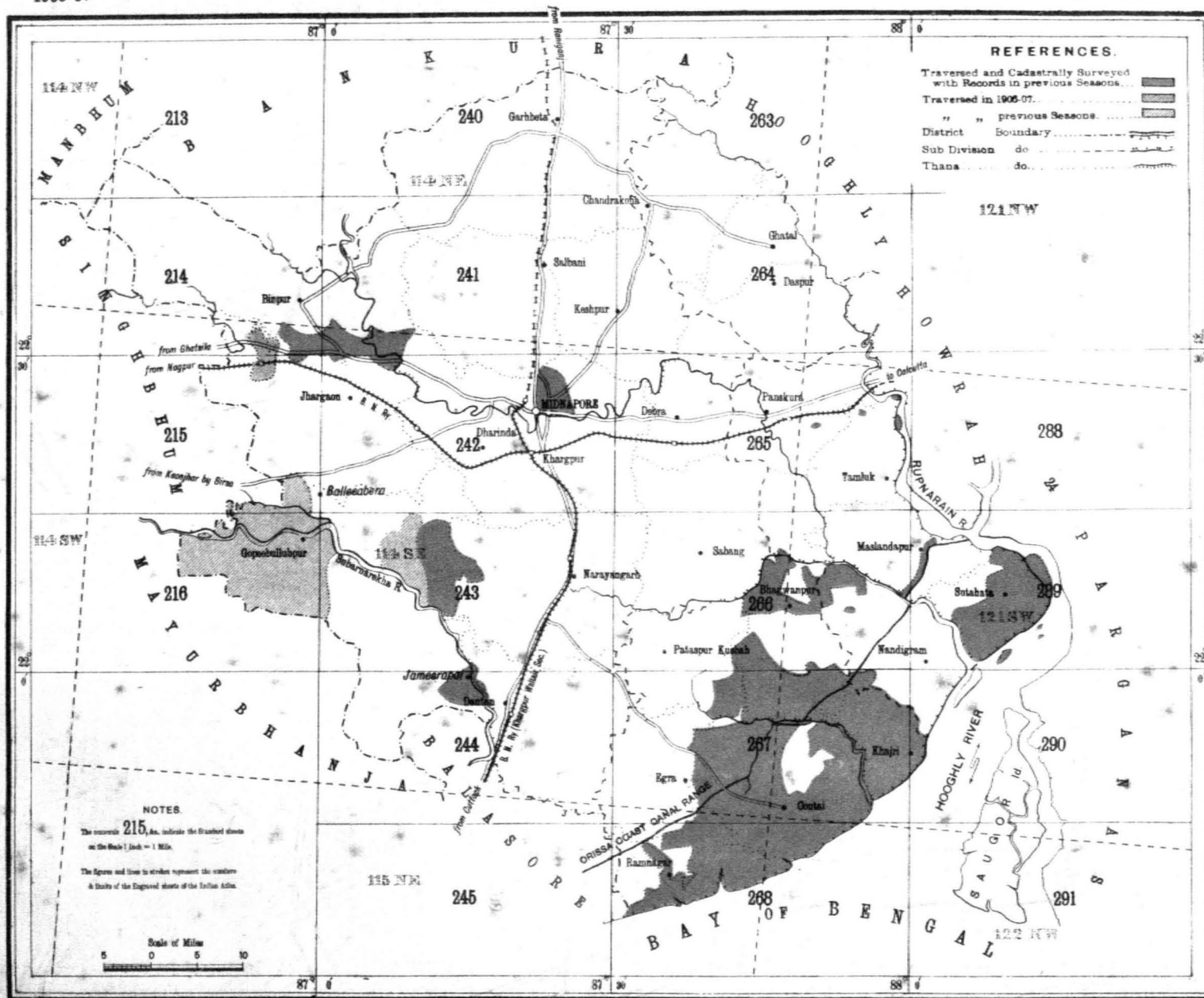


BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY IN DISTRICT MIDNAPORE.

No. 5 PARTY

1906-07



34. No demarcation was possible as sanction to take up the work was received very late; fortunately, in most cases, village boundaries followed the beds of streams and so no difficulty resulted. The people also gave considerable help and the area surveyed being close to the sea coast, the health of the establishment was good.

35. The origin used was the intersection of Latitude $20^{\circ} 19' 49'' \cdot 07$ and Longitude $86^{\circ} 32' 43'' \cdot 75$, this being the origin of former surveys in the district. I have not been able to discover why such an unusually intricate origin was adopted; its main result is that unnecessary complications in computations are introduced and it may be well to record here that for future operations Latitude and Longitude coordinates of whole or half degrees, or one of each, should be adhered to.

36. 14 Azimuths were observed to check the angular work and the mean Magnetic Variation was found to be $0^{\circ} 42'$ East.

37. Altogether 1,455 theodolite stations were used, where possible the old marks were picked up and utilized; out of the total number of stations observed at 119 new stones and 1,336 pegs were embedded.

38. As the plots were urgently required by the Settlement Officer, two chains of different lengths (100 links and 93 links) were used, so as, as far as possible, to eliminate the possibility of errors.

39. Five Great Trigonometrical Stations were connected with and the work proved well.

40. All the plots were sent to the Settlement Officer during the early part of the field season and all computations, etc., are complete.

MIDNAPORE DISTRICT.

Traverse Survey.

41. The area surveyed consisted of 14.86 square miles in Pargana Ghatsilla.

42. No demarcation was done by the inhabitants but no obstruction was encountered.

43. The origin used was intersection of Latitude $22^{\circ} 30'$ with Longitude $87^{\circ} 30'$.

44. Six Azimuths were observed and the mean Magnetic variation is $1^{\circ} 9'$ East.

45. Stone prisms were used for all Trijunctions, and local stones for most of the intermediate stations. 507 Theodolite Stations were observed at and marked as follows:—323 by stones, 146 by galvanized iron cylinders and 38 by pegs.

46. As no Great Trigonometrical Stations fell near the area, connections were made with the adjacent Main Circuit work of Singhbhum District. The work proved well.

47. The 16" and 4" plots were supplied to the Settlement Officers early in the field season and all the records are bound and completed.

RANCHI DISTRICT.

Traverse Survey.

48. During the year an area of 1,128 square miles falling in Thanas Lohardaga, Sisai and Karra was traversed for Cadastral Survey.

49. The angular work was checked by 128 Azimuths which give a mean Magnetic Variation of $1^{\circ} 25'$ East. Four Great Trigonometrical Stations were connected with.

50. The area covered consists on the north of jungle clad hills of a maximum height of about 3,500 feet above sea level, breaking down on to an undulating and tolerably well cultivated plateau averaging 2,350 feet, and sloping south by east. The Subtense Bar and Frasers' height indicating staff had to be used constantly, and with bad demarcation by the inhabitants, and in places, heavy line clearing through dense jungle, the programme was a somewhat difficult one.

51. There were 17,516 new Theodolite Stations which were marked by 15,449 stones (locally procured), 1,057 pegs, and 1,010 marks cut on rocks "in situ" Village Trijunction points were marked on stone or rock with a dot and circle, and all other points marked on stones or rocks by a broad arrow cut thereon.

52. All the computations and plots are complete.

53. The origin accepted for the district is the intersection of Latitude $22^{\circ}30'$ with Longitude 86° .

54. The country was a healthy one to work in, and beyond the prevalence of a certain amount of malarial fever, the climate is excellent.

SINGHBHUM DISTRICT.

Traverse Survey.

55. The programme embraced an area of 601 square miles, falling in the following "Tarafs":—Kalkapur, Haldipokhar, Alkosi Maholia and Asanboni; the traverse survey of Dalbhum is now completed.

56. The angular work was checked by 102 Azimuths and the mean Magnetic Variation is $1^{\circ}20'$ East.

57. The demarcation was badly done partly because boundaries were not known and partly because the inhabitants showed no sympathy with the work; these facts, added to a great deal of malarial fever, affected the progress of and the cost rate of the work.

58. Heavy line clearing was often necessary owing to the wooded and broken nature of the country surveyed. The Subtense Bar was used almost constantly.

59. There were 15,410 theodolite stations, of these 13,101 stones were embedded, 96 galvanized iron cylinders and 1,275 wooden pegs, 938 marks were made on rocks "in Situ." At all village trijunctions stone prisms, of the Bihar pattern, were embedded.

60. The work has not, in every case proved well; during my monsoon tour the officer in charge No. 5, Party pointed out several villages in which a large amount of check survey had failed to eliminate errors and I issued orders for increased corrections to be proportionately applied throughout the village in each such case; these corrections are not sufficiently heavy to vitiate the plots for cadastral purposes, and unusual corrections have not in any case, been applied to main and sub-circuit work.

61. Two great Trigonometrical Stations were connected with.

62. The plots and records are practically completed; the former will all reach the Settlement Officer in ample time and the latter will be completed before the party takes the field again.

SONTHAL PARGANAS DISTRICT.

Traverse Survey.

63. The area traversed (807 square miles) covered the remainder of the district left over from the last survey year; it falls in 7 scattered blocks, falling in the Subdivisions of Deoghar, Dumka, Pakaur, Goda and Jamtara and is commonly known as Mr. Craven's second area.

The country is open, and somewhat undulating and is very healthy.

64. The inhabitants are in sympathy with the operations; their demarcation was good, their attitude throughout our operations has been one of cordial co-operation and it is with regret that the surveyor realizes that for many years to come his work must lie in less favoured districts.

65. The total number of traverse stations is 14,997; of these 12,250 have been marked by stones of the Bihar pattern, 686 by clay cylinders, 421 by marks cut on rocks "in situ" and 1,640 by wooden pegs.

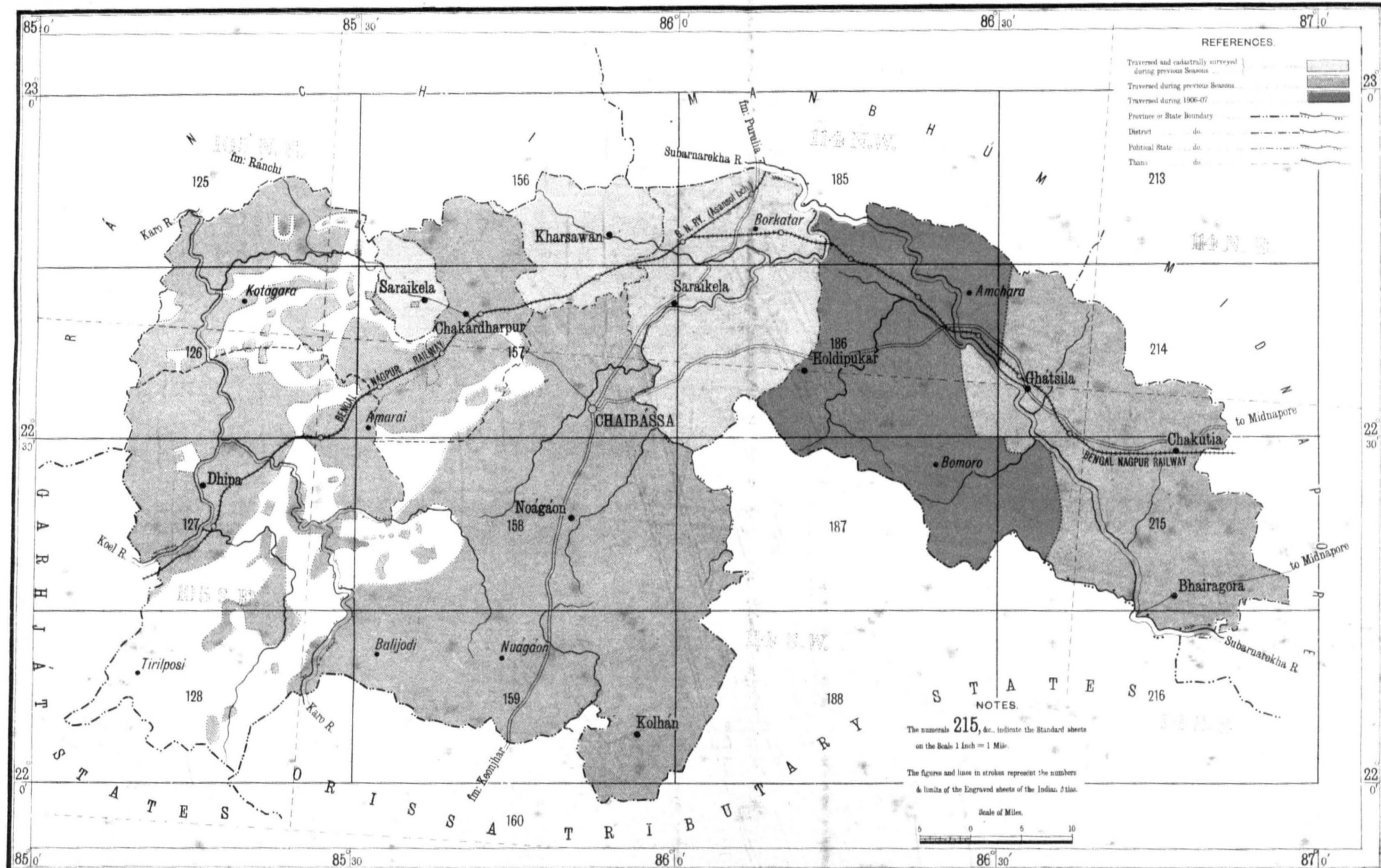
66. No Great Trigonometrical Stations were connected with; the work was adjusted by accepting the values of stations common to this and previous year's work; the values of which were accurately known.

BENGAL SURVEY.

INDEX TO THE CADASTRAL SURVEY IN DISTRICT SINGHBHUM.

1906-07

No. 5 PARTY.

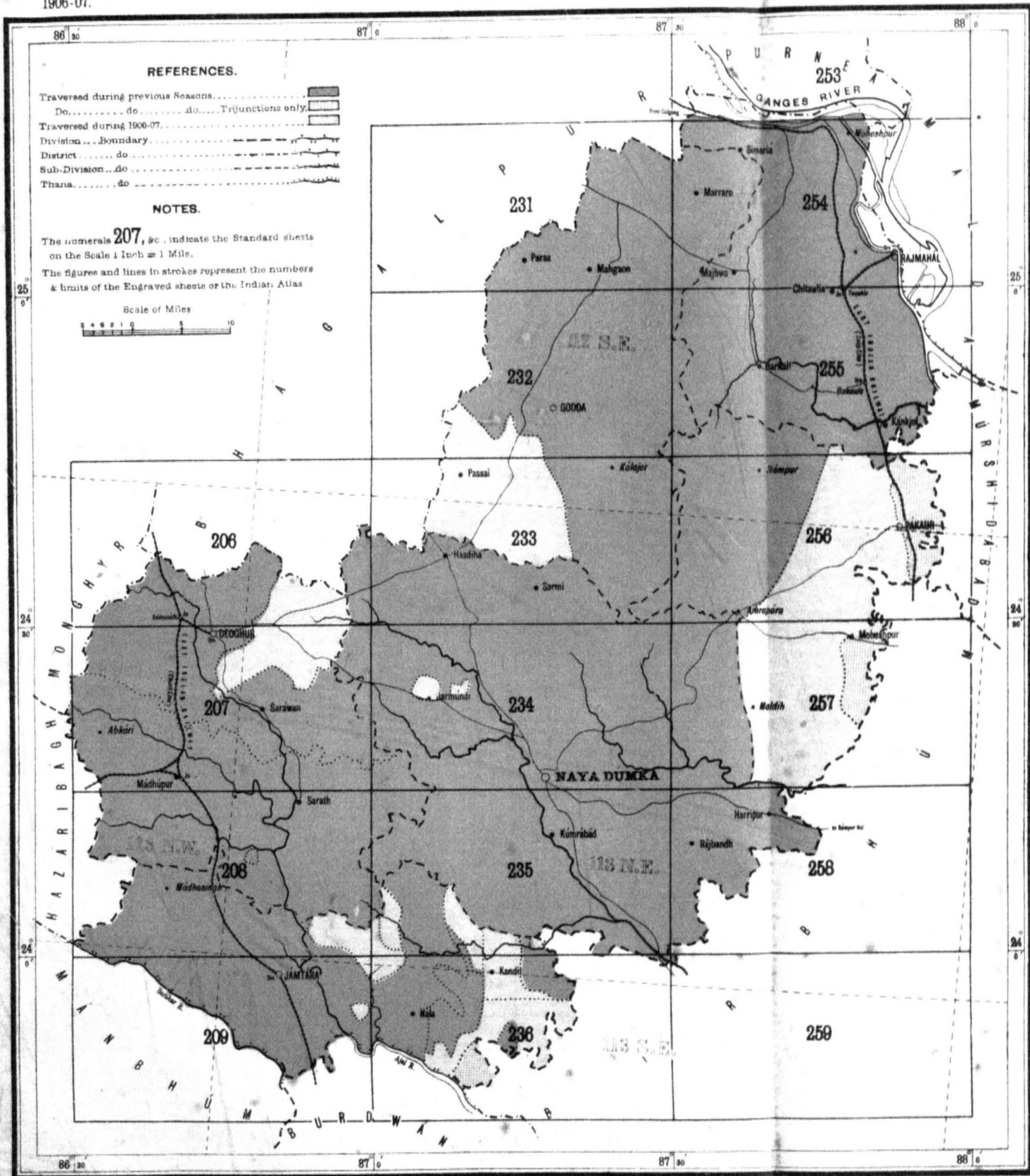


BENGAL

INDEX TO THE TRAVERSE SURVEY IN DIST. SONTHAL PARGANAS

No. 5 PARTY.

1906-07.

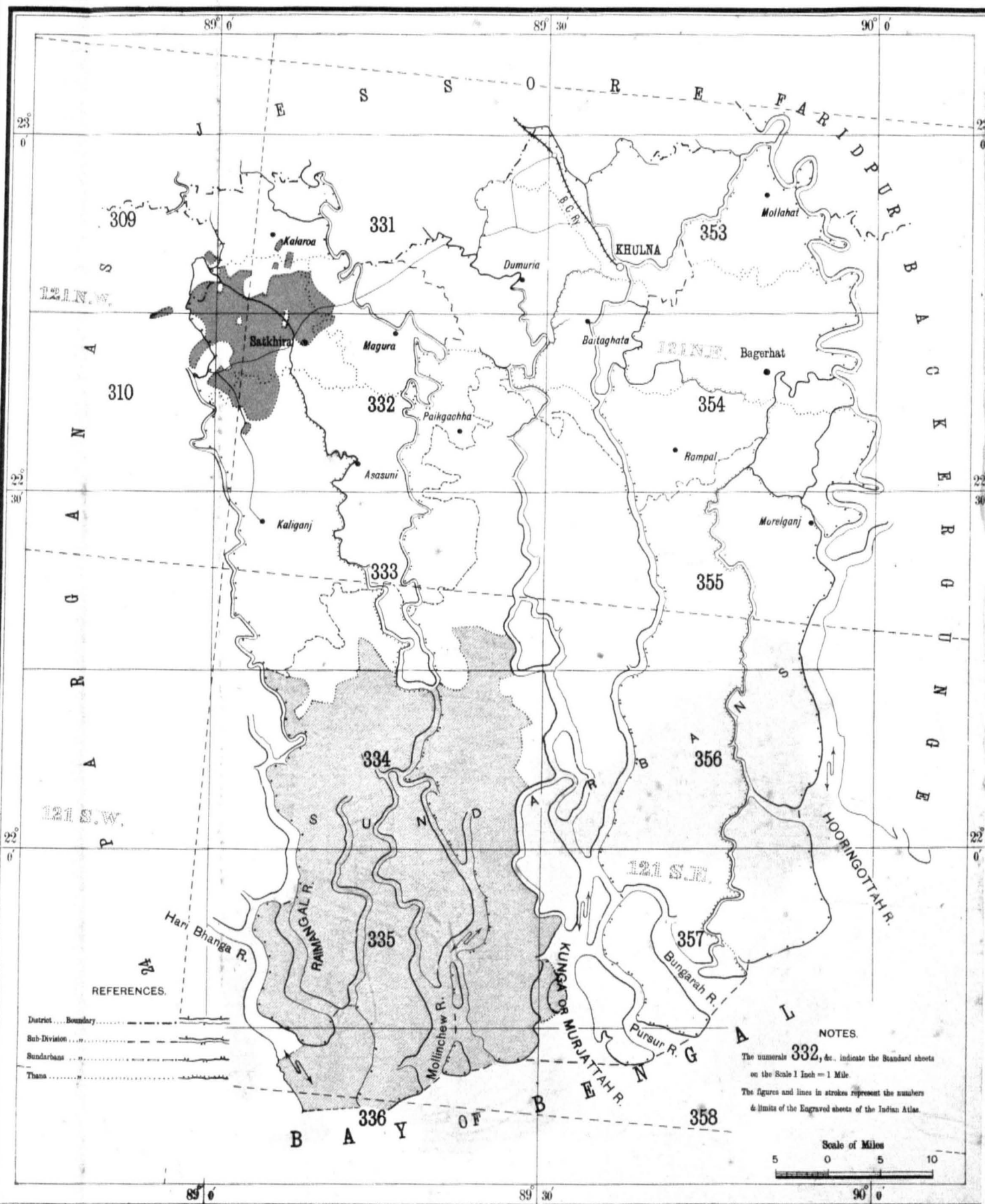


BENGAL SURVEY.

INDEX TO THE TRAVERSE AND TOPO SURVEY IN DISTRICT KHULNA.

1906-07.

No. 6 PARTY.



REFERENCES.

District Boundary
 Sub-Division
 Boundaries
 Thana

NOTES.

The numerals 332, &c., indicate the Standard sheets on the Scale 1 Inch = 1 Mile.
 The figures and lines in strokes represent the numbers & limits of the Engraved sheets of the Indian Atlas.

Scale of Miles

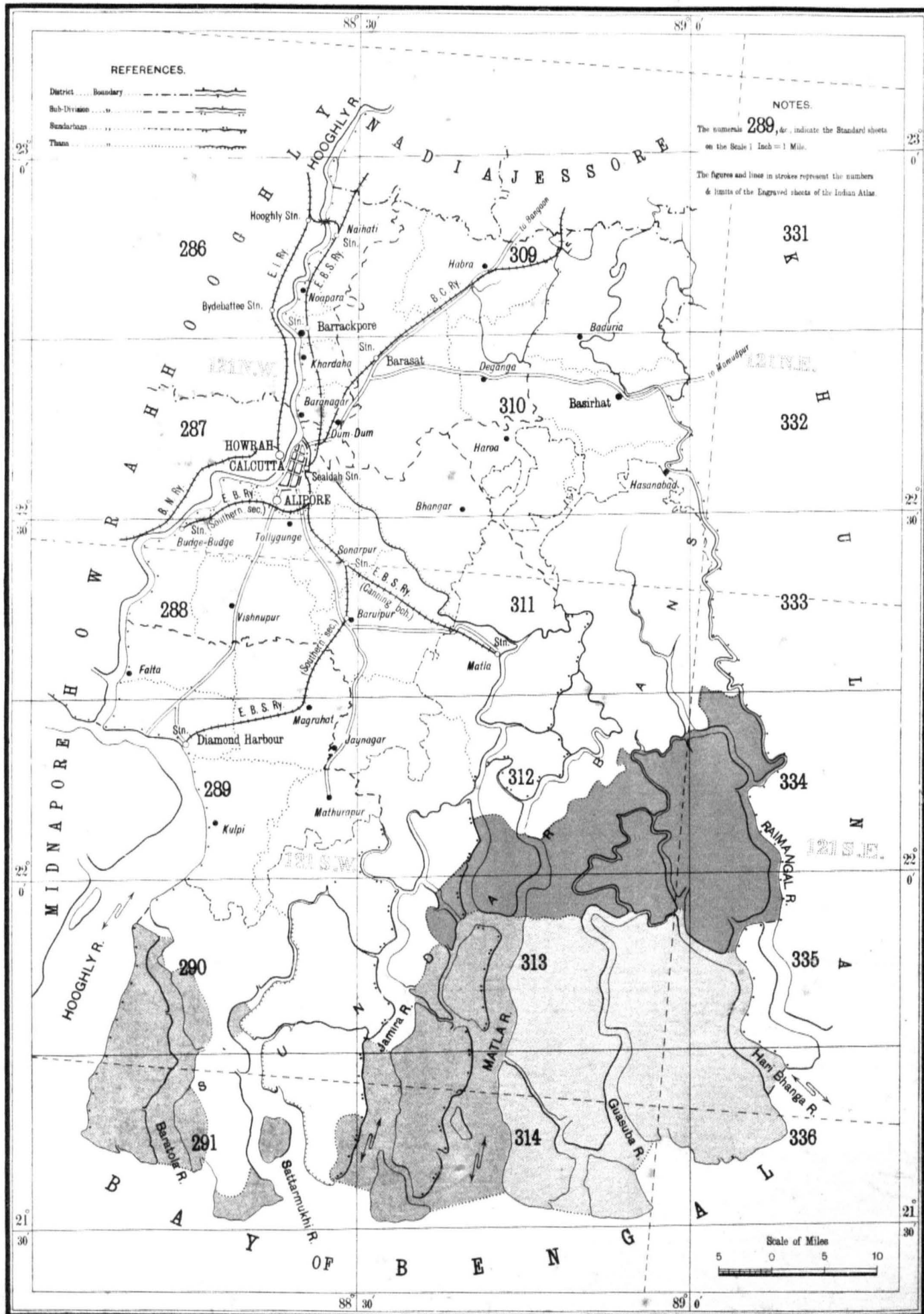
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BENGAL SURVEY

INDEX TO THE TRAVERSE AND TOPO SURVEY IN DISTRICT 24 PARGANAS.

1906-07.

No. 6 PARTY.



67. 81 Azimuths were observed and the mean Magnetic Variation is $1^{\circ}33'$ East.

68. The computations are complete and the plots have been sent to the Settlement Officer, Sonthal Parganas.

DISTRICT 24-PARGANAS AND KHULNA (SUNDERBANS).

DISTRICT 24-PARGANAS.

Traverse Survey.

69. The programme was the remaining portion of the 24-Parganas Sunderbans, including Saugor Islands (an area estimated to be 500 square miles.)

70. The operations were in continuation of those of the preceding season and connections were made with three Great Trigonometrical Stations of the East Coast Series. The error per mile works out to 7.4 feet.

71. The programme was exceeded by 138 square miles, the total area traversed being 638 square miles of which 319 square miles represent upland, and 319 square miles water areas. The angular work was checked by 61 Azimuth observations to the sun and stars, and the mean magnetic variation is East $1^{\circ}14'$. The Zig-Zag system of traversing was again adopted with excellent results. The chaining amounts to 677 linear miles.

72. The theodolite was set up 2,347 times, and there are 2,169 new stations of which 303 are trunks of trees cut down to the required height, of these, the tops of 208 trunks are encased with galvanized iron cylinders. 1,866 pegs were embedded and these were surmounted with cross sticks painted white for easy identification.

73. Two steam launches, three flats and 85 boats were hired for accommodating the field establishment and for supplying the squads with food and fresh water. One Hospital Assistant, with medical stores, was constantly in the field, and the serious cases were attended to by a second Hospital Assistant at the head quarters at Canning Town. The difficulties experienced were the same as those of previous years. Severe storms, the prevalence of tigers and the possibility of being cut off from supplies of food and fresh water were the main causes of trouble and anxiety. Malarial fever and dysentery were the chief complaints; these accounted for twelve deaths.

Topographical Survey.

74. The whole area of 638 square miles traversed, was topographically surveyed on a scale of four inches to one mile and mapped on 66 sheets.

75. The detail survey was checked by 658 linear miles of check survey and, in addition, portions of nearly all the blocks were independently resurveyed; the result was most satisfactory. The Sundarbans Survey of the 24-Parganas is now completed.

76. The entire area is intersected with tidal rivers and creeks, land areas being covered with dense jungle, except in the case of Saugor Island, of which the greater portion is under cultivation. Traces of all the blocks have been prepared for the Settlement Officer and a trace map of Saugor Island for the Port Officer, Calcutta.

77. The entire season's work will be completed before the establishment takes the field on the 1st November next.

DISTRICT KHULNA.

Traverse Survey.

78. The order for the survey of this district was conveyed in the Board's letter No. 5889A., dated the 6th December 1906 and the establishment, on completion of the 24-Parganas Sunderbans, left Canning Town on the 8th February 1907 and encamped at Nakipur, a small village on the northern limit of the Khulna Sunderbans area. Field work closed on the 20th April when the party

returned to recess quarters at Barrackpore. The programme was the traverse and topographical survey of 840 square miles of Government Reserved forests.

79. The origin of survey adopted was the intersection of the parallels of N. Latitude $22^{\circ} 30' 00''$ and E. Longitude $89^{\circ} 30' 00''$.

80. The area traversed was 953 square miles (or 113 square miles in excess of the programme). The whole area was divided into 45 blocks.

81. The angular work was checked by 124 Azimuth observations to the sun and stars and the mean magnetic variation of the needle is East $1^{\circ} 11' 00''$.

82. There are no Great Trigonometrical Stations in or near the area traversed. The co-ordinate values have been obtained from the 24-Parganas Sunderbans traverse survey, which was connected to the East Coast Series.

83. The theodolite was set up 4757 times and there are 4423 new stations which have been marked with 215 galvanized iron cylinders, 1,028 trunks of trees and 3,180 pegs. The Zig-Zag system of traversing was adopted and proved a complete success. There are 1105 linear miles of chaining, and the area comprises 698 square miles of upland and 255 square miles of water.

84. The nature of the country is similar to that of the 24-Parganas, Sunderbans, except that the whole tract is Government Reserve Forest containing much good timber. Khals and streams are innumerable and form a complete network over the whole area. It would be impossible to make a survey without the aid of steam launches, flats and boats as the difficulties are abnormal.

Topographical Survey.

85. The entire area of 953 square miles traversed was topographically surveyed on a scale of 2" to 1 mile and the mapping has been done on 35 sheets.

86. The detail survey was subjected to 723 linear miles of check work and the results proved satisfactory.

87. Trace maps of the whole area have been prepared for the Forest officer, and the season's work will be completed before the camp takes the field next season. The programme of the next season is the completion of the survey of the Khulna Sunderbans, an area of about 1,050 square miles.

88. The health of the establishment was bad, mainly owing to malarial fever and dysentery. There were five deaths from dysentery and one man was carried off by a tiger.

PART III—MISCELLANEOUS SURVEYS.

BHAGALPUR DISTRICT.

Colgong Municipality.

89. This Municipality was omitted from cadastral survey in 1905-06. This year the Settlement Officer required the Municipality to be cadastrally surveyed, it being almost entirely under cultivation.

90. The area which comprises 5 Revenue Survey villages, was 2.27 square miles; 265 new traverse stations were laid down, of which 80 were iron pegs and were embedded in the town, the rest of the stations were marked with wooden pegs.

91. The cadastral survey was checked by 15 miles of test survey, which gives an incidence of $6\frac{1}{2}$ linear miles of check survey to each square mile of detail survey.

92. There were 2,542 plots in the area, of which the entries of 1,005 were tested; this gives an average of 39 per cent. of the total number of entries.

93. There were two boundary disputes, both of which were settled. Of the 271 internal disputes, 183 were settled, the balance will be dealt with at attestation.

94. The attendance was good.

Mawalikabad village.

95. This village was topographically surveyed in 1903-04 and cadastrally surveyed this year. The area was 7 square miles.

Thana Kishanganj (Kosi Diara).

96. A small area of 1.7 square miles in thana Kishanganj was traversed for cadastral survey. This area comprised two Revenue survey villages, which had been topographically surveyed in 1903-04.

97. The cadastral survey was undertaken and while the survey was in progress it was discovered that only one of the two villages contained a Government estate; the survey and records of this village were completed; the area cadastrally surveyed was 1 square mile.

Purnea District.

98. Thirteen villages were traversed for cadastral survey in this district, 12 of which were in the Kosi Diara, and had been topographically surveyed in 1903-04. The villages were scattered over a considerable area, and orders to undertake the survey were received very late in the season (10th May 1907.)

99. The area traversed was 21.3 square miles, in which 490 new theodolite stations (all wooden pegs) were laid down.

100. The area cadastrally surveyed was 20.6 square miles. The records of only 8 of the 13 villages were prepared as the Collector decided that the records of the remaining five were not required.

101. The survey was checked by 70 miles of test survey which gives an incidence of 3.4 linear miles of test survey to each square mile of detail work.

102. The entries of 291 plots were checked, this is an average of 38 per cent. of the total number of plots.

*Nepal-Darjeeling Boundary.**Mechi River.*

103. In 1905-06 Mr. C. A. O'Donel was deputed to refix the positions of the boundary pillars along the Nepal-Darjeeling boundary that had disappeared and also to mark positions for reference pillars.

104. Although the Deputy Commissioner was requested to make the necessary arrangements, the pillars were not erected after Mr. O'Donel finished his work, and Mr. Newton was deputed to go over the same ground this season. Work was begun on the 1st March and completed by the 25th April. The Subdivisional Officer of Kurseong accompanied Mr. Newton along the boundary.

Nepal (Bhagalpur and Purnea Boundary).

105. The temporary marks erected along this boundary in the old bed of the Kosi river were inspected this year. It has now been decided to replace the temporary marks by pucca pillars and to build reference pillars.

This work will be taken up during the coming field season.

Jamulpur Municipality.

106. The map of Jamalpur Municipality prepared by the Railway Engineer was tested to see whether it would be, when reduced, sufficiently accurate and up to date for the standard mapping. A new survey was made, mainly because the railway map was partially out of date.

Binda Diara, District Monghyr.

107. At the request of the Collector of Monghyr, the boundary of the Binda diara was tested to see what marks had disappeared since the last survey. A re-survey of the boundary on the 16-inch scale was made and a map prepared for the Collector, showing the present boundary and the boundary surveyed a few years ago. The boundaries agreed very well.

Bhagalpur Municipality.

108. The revision of the maps and records of this area, which were prepared in 1903-04, was undertaken at the request of the Collector, it being stated that the work was originally indifferently done.

109. Every plot and every entry were checked and mistakes eliminated. The work was completed on the 26th August.
110. The total number of Municipal holdings is 33,611.

REPORT ON THE UDAIPUR-BILASPUR BOUNDARY DISPUTE TRAVERSE SURVEY.

Season 1906-07.

111. The traverse survey and demarcation of the remaining portion of the Udaipur State, touching on the Korba zamindari in district Bilaspur, was sanctioned in the Central Province Gazette Notification No. 1419, dated the 12th November 1906 and Mr. Bamanji Mancherji was appointed Boundary Commissioner in connection with the settlement of the boundary.

112. One Traverser was deputed for the Traverse Survey of the above-mentioned boundary; he was placed under the direct orders of the Boundary Commissioner. The traverser was sent to Raigarh in the beginning of December 1906 and worked there till the end of March 1907. Owing to the hilly nature of the country and also to the very heavy jungles, the traverser was detained for a longer period than was expected.

113. The traverse data of a portion of the Udaipur Boundary touching on Raigarh in District Sambalpur traversed during season 1903-04 was supplied to the Boundary Commissioner.

114. Seven Azimuths were observed and the mean magnetic variation was $1^{\circ} 6' E$.

115. Only one station of the Great Trigonometrical Survey was connected with the work.

116. Out of a total number of 318 new theodolite stations 254 were marked by stones, 30 by pegs and 34 were cut on rocks "in situ."

117. The entire length of the boundary traversed was 59 linear miles.

118. The origin of the survey was the same as used in previous season's work viz. the intersection of N. Latitude $22^{\circ} 30'$ and E. Longitude $83^{\circ} 30'$.

119. The 16-inch plots of the boundary as traversed were supplied to the Boundary Commissioner, the setting up and plotting being done by No. 5 party.

PART III.—REPORT ON MISCELLANEOUS SURVEYS.

Calcutta Suburbs Survey.

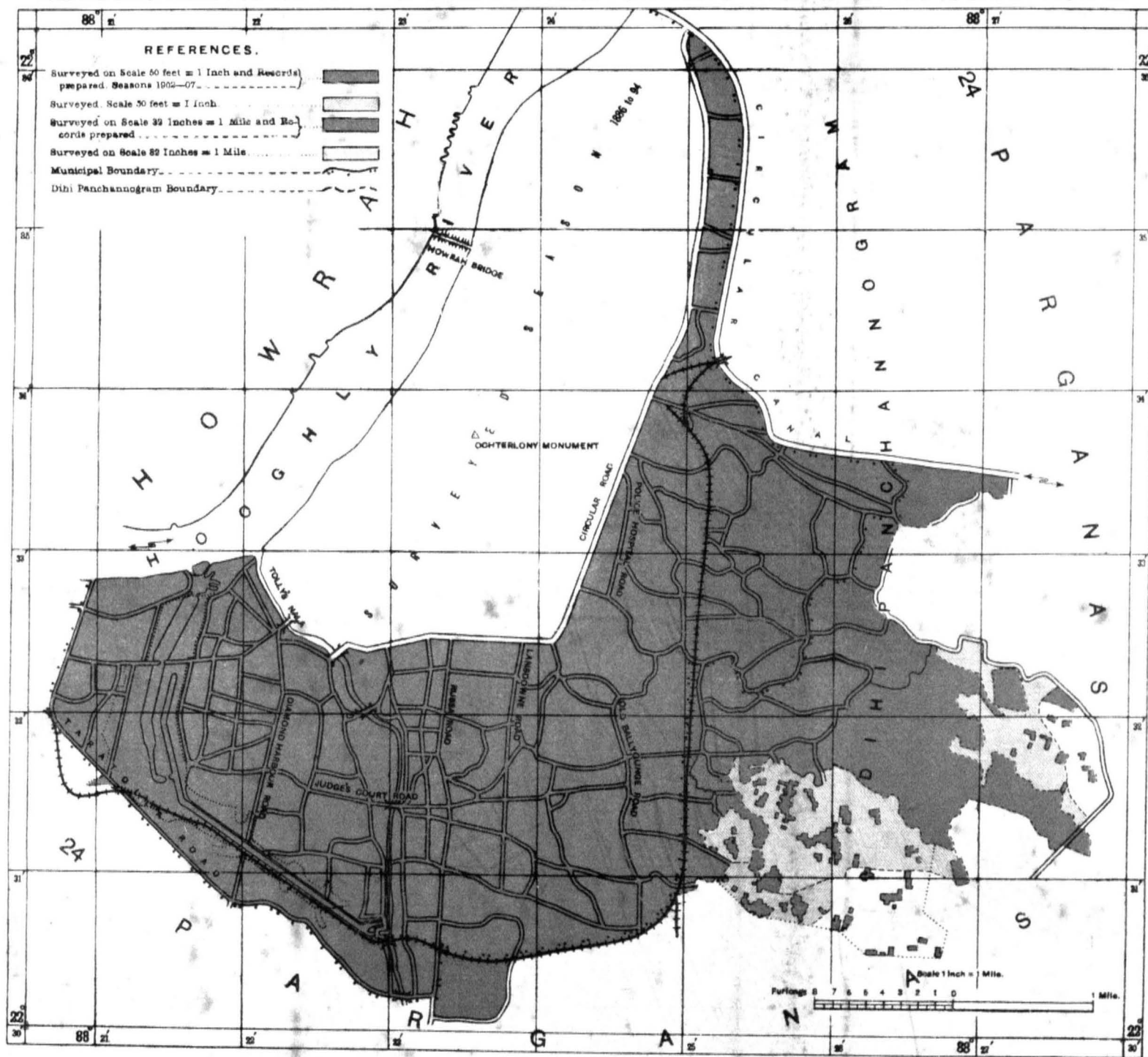
120. The work chiefly consisted of (a) Demarcation of holdings both insides and outside Municipal limits not traceable, (b) Comparison of old and new maps, (c) Settling boundary disputes, (d) Preparing fair maps for publication, (e) Traversing work for the Port Trust Commissioners, (f) Detail survey for the Port Trust Commissioner's area, (g) An attempt to revise those portions of the old City Survey sheets which require revision to admit of the Suburban survey sheets, which lie along the boundary between City and Suburban areas being completed to margin, (h) the completion of records for attestation, (i) area calculation.

121. With reference to item (a) above the demarcation of the remaining Municipal holdings was completed in 83 Municipal and 115 Panchannogram holdings outside Municipal limits; in addition a considerable number of holdings, required to be separated by the Attestation Officer, were dealt with. The demarcation cannot, however, be said to be completed until the attestation is finished.

122. Item (b) was reported on in paragraph 84 of the last year's report. There are some old maps which show the boundaries of villages inside the area, these are revenue boundaries and so have not been shown on the larger scale maps; on the matter being referred it was decided that the boundaries need not be shown.

123. Item (c). Inside Municipal limits 2,617 boundary disputes were dealt with by the end of July when the Sub-Deputy Collector, who was helping in

INDEX TO THE SURVEY OF THE ADDED AREA TO THE TOWN OF CALCUTTA AND PORTION OF DIHI PANCHANNOGRAM 1902-07



this work, reverted to his substantive appointment; during the current year 370 disputes lying inside and 241 outside Municipal limits were disposed of. There were 51 appeals preferred, all of which have been dismissed; many disputes after appeal were taken to the civil courts, but with what results we do not yet know, and so none of the boundaries have been changed; these disputes are all taken to the civil courts with reference to the claim made by the Corporation to road side drains.

124. The owners during the year have shown very much more interest in the proceedings than they have done in other years; the value of the work is apparently appreciated and where owners formerly had to be summoned to attend, they now come forward of their own accord and apply for further enquiry as regards ownership and boundaries of holdings. This appreciation has resulted in increased work, which, however, is not a matter for regret; with regard to boundaries, these can generally be disposed of, but where title is concerned, the applicants are referred to the civil courts, after documents have been inspected and depositions taken.

125. Item (d) is fairly well advanced; an extra officer was appointed to attend to the examination of maps and his appointment has prevented arrears of work accumulating. Out of 397 maps of the Suburban area for the Calcutta Corporation, only 37 remain to be drawn, until orders are received regarding the adjustment of the boundaries along the lines of junction of City and Suburban areas, the drawing of these sheets must be held in abeyance, the remaining 360 maps are in different stages of completion.

126. Of fair maps for revenue purposes, there will be, in all, 469 sheets drawn in skeleton on the 50-foot scale these will only show the boundaries of the holdings of the Panchannogram Government Estate with the Municipal holdings contained in each revenue holding.

There will also be 29 maps on the 32 inch scale of the Subdivision of the Panchannogram Estate lying outside Municipal limits, these maps will be drawn in detail.

Of the 50 feet maps 256 have been drawn, since, when vandyked, one set of numbers of holdings will be in red and the others in black, duplicate copies will have to be made, one showing all detail required in red and the corners of sheets and the other all other details. Only the maps of subdivisions which have been attested can be taken in hand. Of the 32-inch scale maps only one has been drawn.

The examination of all the maps mentioned in this paragraph as well as the printing, remains to be done.

127. In item (e) the only traversing done is that of 1,493 acres for the Port Commissioners; there still remains, however, a further tract to be traversed, the area to be dealt with having been under-estimated originally.

128. Item (f) of the Port Commissioners' area, the detail survey of 600 acres of the lands traversed was carried out; this work has been delayed by the great amount of water which accumulated during the rains, in some parts considerable areas being entirely submerged.

129. No traversing or detail survey other than that mentioned in last two paragraphs has been done during the year. The work referred to in item (g) has not progressed because holdings have been freely divided and in some place the old boundaires have been encroached upon, or changed; in order to facilitate this work, application has been made to have the area notified for survey under Act I of 1887.

130. The completion of survey and demarcation of one subdivision which consists of detached lands was stopped by the Collector of 24-Parganas; the work proved to be very expensive, owing to the difficulty of tracing these lands with no map to guide the surveyor, and it has been decided to postpone the attempt to survey and demarcate them, until the 24-Parganas are surveyed.

131. Item (h). There are 69 khasras in the Pachannogram Estate and all have been completed and submitted for attestation, the last two being despatched on the 2nd August 1907. Forty-two of the Khasras have been attested as follows:—In 1905-06 18 khasras and in 1906-07 24 khasras.

There are four other Government Estate Khasras which have been submitted but not yet attested. Until attestation is completed, the Revenue maps cannot be compiled.

132. Item (i) has been completed, except for areas to be divided into revenue holdings, these are dealt with as they are received from the Attestation Officer.

PART IV.—REPORT ON THE BENGAL DRAWING OFFICE.

133. Mr. L. F. Berkeley, Extra Assistant Superintendent, 1st grade, held charge until the 10th July 1907 when Mr. P. C. H. Smart, Extra Assistant Superintendent, 3rd grade, took over Mr. Berkeley's duties, the latter being on well-earned privilege leave until the close of the year under report.

134. The reproduction outturn of the office has increased considerably in the last year and the whole staff has been compelled to work long hours to meet the demands put upon it. It had been hoped that all arrears work would be completed by 1st April 1908, but, from the progress made up to the 30th September 1907, it is obvious that considerable arrears will have to be dealt with in the recess season of 1908. It cannot be said that there has been any failure so far; the plant available is insufficient to cope with the vast amount of work required, and if the plant were increased, in a year's time a portion of it would have to lie idle; to increase the plant now would therefore not be an economical move, while to obtain a larger outturn from the number of presses, etc., now available, seems impossible.

135. The work of the office is divided into seven main sections:—

- (a) General or Controlling section.
- (b) Standard Mapping section (including the preparation of District maps).
- (c) Traverse Chart Section.
- (d) Thana and Trijunction Mark Maps section.
- (e) Reproduction of village Maps Section.
- (f) Badar Section.
- (g) Record „

Standard Mapping Section.

136. The old size of a standard map was 20 minutes of Longitude and 15 of Latitude; the size has recently been reduced to 15 minutes of Latitude and 15 of Longitude. During the year under report six standard sheets of the old size ($72 \frac{J}{10 \text{ and } 14}$, $\frac{J}{11 \text{ and } 15}$, $\frac{J}{12 \text{ and } 16}$, $\frac{K}{9 \text{ and } 12}$, $\frac{K}{10 \text{ and } 4}$ and $\frac{K}{11 \text{ and } 15}$) of districts Darbhanga, Monghyr and Bhagalpur, west of Longitude 87° E , were dealt with, a strip of $2' \cdot 27''$ being added to their Eastern margins to avoid a gap occurring between these sheets and those of the new style which fall East of Longitude 87° E ; this was necessary because the new style sheets will be in terms of the latest value of the Longitude of Madras. The first five (old size) sheets mentioned above have been completed and submitted for publication together with (new style) sheet $72 \frac{N}{2}$. Sheets Nos. (new size) $72 \frac{N}{3}$, $\frac{N}{4}$ and $\frac{O}{1}$ have been practically completed during the year and will be sent for publication by the end of next January; of the others being worked on Nos. (new style) $72 \frac{O}{3}$ and $72 \frac{O}{2}$ are well in hand.

137. The quarter inch map of the District of Darbhanga had been sent for publication and the maps of Monghyr and Bhagalpur districts should be commenced next year together with several new standard sheets of Bengal.

138. Index map of districts Puri and Patna have been completed during the year. In addition to this miscellaneous work this section has carried out the following:—

- (a) Colouring of fiscal limits on 17 unpublished proofs of nine standard sheets.
- (b) Final examination of 17 unpublished proofs of nine standard sheets.
- (c) Ditto of two unpublished proofs of one district map.
- (d) Small additions and corrections have been inserted in 20 published proofs of ten Standard sheets.
- (e) Two inch mujmili (rough maps) of the Dompura Estate, District Cuttack and of the Koderma and Sarkari Hata Government Estate, District Hazaribagh, have been compiled.

139. Colonel Hodgson, Deputy Surveyor-General, has kindly given much time to the supervision of this section, and his orders and suggestions have very greatly facilitated the work.

Traverse Chart Section.

140. Traverse charts giving full details for the use of the Topographical Surveyor hereafter are under preparation for the whole of the Orissa Division on a scale of 1"=one mile. Orissa falls on 49 charts, of these, during the year, 13 have been sent to the Head Office of the Survey of India, 15 have been completed and are practically ready for submission, 10 have been dealt with up to the examination stage and the remainder are well in hand. As soon as Orissa is finished, North Bihar will be taken in hand on the $\frac{1}{2}$ " or 1" scale. I propose to strengthen the section considerably so as to permit of the arrears being worked off as soon as possible and will submit proposals to this effect shortly.

141. The re-computation of co-ordinates of the trijunctions of villages so that their values from the district origin in rectangular co-ordinates may be used for the plotting of Traverse charts, has, during the year, been completed for 3,434 villages in Bihar, while the values of the trijunctions of 9,442 villages of the Orissa Division have been recomputed and either entered on the charts or are ready for entry on them.

142. In this section again Colonel Hodgson has given us much help.

Trijunction Mark and Thana Mapping Section.

143. The trijunction mark maps of ten thanas of District Darbhanga (33 copies), of three thanas of North Monghyr (208 copies) and four thanas of North Bhagalpur (256 copies), one thana of Cuttack (nine copies), completing the Cuttack District, have been prepared. Of scattered cadastrally surveyed areas maps for portions of six thanas of Gaya (22 copies) and two thanas of Patna (six copies) have been made. In District Purnea the work has been pushed forward as hastily as possible; the thanas maps of this District are urgently needed, and to meet this demand, instead of awaiting the 2" drawing of the Standard sheets, we have had to compile special 2" plots in many cases. The results has been less delay than would have occurred if the 2" standard mapping had been awaited, but the system is not an economical one.

144. Three hundred and forty copies of the Trijunction mark maps of nine thanas of Ranchi and 36 copies of two thanas of Singhbhum (Sarai Kela and Kharsawan Estates) have been printed and supplied from maps prepared from mujuilis made by Settlement Officers.

145. The Thana maps of four thanas of North Bhagalpur and two thanas of Purnea District (200 copies of each) have been prepared and issued to the Director of Land Records; in addition to these 200 copies of each of nine thanas of Ranchi District and four thanas of the Singhbhum District (Sarai Kela and Kharsawan) have been made from traces sent by the Settlement Officer.

146. The whole question of thana mapping needs very careful consideration. I am at present in communication with the Director of Land Records on the subject, and have every hope that a system which will result in increased rapidity of outturn, economy and uniformity of method will shortly be possible.

Reproduction of Village Maps Section.

147. In paragraph 113 of last year's report, Major Crichton gave the outturn of the office for 1905-06 as 462,961 copies of maps produced by the Vandyke process and despatched. This year the outturn is 505,545 maps; both Major Crichton's and my figures exclude work done for Eastern Bengal and Assam, this comparison hardly shows the relative amount of work done in the two years because in many cases, in the year under report, the average number of pulls is smaller than it was in 1905-06 but in spite of this the outturn has been considerably increased.

148. Of the programme budgetted for the following items have been dealt with :—

- (a) After the cursory re-examination (mentioned as necessary in last year's report) of the remaining copies printed in 1904-1905, the issues for the whole of the *Muzaffarpur District* have been completed, 27,434 printed copies being despatched during the year.
- (b) With regard to Champaran, the examination of the paper traces of such maps as had not been vandyked and the examination of such reproduction as had not been despatched, took up much more time than was expected, but the 39,910 copies which still remained to be despatched have been dealt with.
- (c) In Darbhanga only 11 of the 21 sheets which remained could be traced during the year; the failure is due to the 16" sheets of Chaprasan village having to be returned to the Cadastral Camp concerned for revision. With this exception out of a total of 9,082 sheets in the district, which fall on 7,373 paper traces, (all of which have now been examined and vandyked), 55,290 copies (out of a total of 73,730 printed) have been sent to the Collector. In this district again the cursory re-examination of the paper traces prepared in 1904-1905 has retarded despatches.

149. In North Monghyr out of an aggregate of 3,875 sheets, 3,350 were traced on 2,950 paper traces last year; this year 423 sheets have been traced on 411 paper traces and the total traced and examined is now 3,773 sheets on 3,371 paper traces; all of these except 226 have been examined and of these 226 only a portion of the examination remains to be done. Of the 102 sheets remaining to complete North Monghyr 75 have been returned to field parties and there is some doubt whether the other 27 will be required to be reproduced or not.

Forty eight thousand one hundred and forty copies of maps have been reproduced up to date as follows :—

(a) Two thousand four hundred and one traces originally printed (10 copies each)	...	...	24,010
(b) One thousand nine hundred and seventy-nine of the above re-vandyked and printed with an extra 10 copies each	...	...	19,790
(c) Two hundred and seventeen traces printed with 20 copies each	...	...	4,340
			—
Total	...	...	48,140
			—

150. In Purnea the work of season 1903-1904 consists of 2,264 sheets of which 307 were on thick paper from which direct reproduction was impossible; these 307 sheets, when traced, fall on 322 paper traces and the total number of sheets and traces for reproduction is therefore 2,279.

These have been vandyked on 2,297 plates, since in some cases two villages were mapped originally on one sheet, all but 30 plates, in the maps of which "badars" (corrections) have been found, have been printed, but until the "badars" are returned rectified, 5,100 copies cannot be issued.

151. The reproduction of the work of seasons 1901 to 1903 in Purnea district comprising 1,332 sheets and a requirement of 20 copies of each, vandyked from traces, has resulted in 14,120 copies being printed and 13,160 despatched.

152. Of the work in Purnea district done in 1904-1905 covering 3024 sheets, 98,960 copies of 1,119 sheets were printed and 61,850 despatched.

153. In North Bhagalpur there are, in all 2,808 sheets for reproduction; this total includes 353 sheets of the survey of 1888-1889; this has involved

a considerable amount of tracing, all the maps being on thick paper. Up to date 41,650 copies have been despatched, the balance of the work is in hand.

154. In Ranchi, of the work of 1902-1903, the 1,465 copies which remained from last year to be supplied have been despatched during the year.

155. The programme in Ranchi of 1903-1904 covered 1,497 sheets; as the attestation copies of 265 of these have only just been received for the correction of originals, only 25,860 copies of the remaining 1,232 sheets on 1,293 plates could be supplied, two or more villages mapped on one sheet having first to be separated. Of 992 sheets made in the field in 1904-1905, 20 copies of each of which are required 3,500 copies only have been supplied; the rest of the work is in hand.

156. In last year's report it was mentioned that in the Sonthal Parganas approximately 15,200 paper traces would need reproduction; the traces are being prepared by the Settlement Officer who issues copy orders. During the year 4,537 traces have been reproduced and 140,680 copies supplied, the total number of traces and copies dealt with to date being 9,316 traces and 233,250 copies.

157. In Singhbhum 1,133 sheets required reproduction; 20 copies of each sheet have been supplied.

158. In the Banki Government Estate of Cuttack, in last year's report it was mentioned that, owing to the colour having been used on the revised settlement trace maps, direct reproduction was impossible; it was also mentioned that 211 original paper traces of the 144 villages of this estate were being corrected before reproduction, and that the additions and corrections made at the time of revision survey were so numerous, that it was decided, instead of correcting the original maps, to file with the originals, copies of their corrected paper traces. Out of the 174 paper traces corrected last year discrepancies were found in 71 villages; others had to be referred back to the Collector; in addition 22 villages on 24 sheets had to be returned to the Collector for rectification, as a comparison with the originals showed the traces to be out of proportion. Of 115 villages so far sent back to the Collector 93 have been received back corrected up to date, so taking into account the 660 copies of 22 traces supplied last year only 150 traces could be vandyked in this year, 2,280 additional copies have been supplied, making a total of 2,940 copies (98 traces) to date, 30 copies of each trace being required.

159. In Angul 973 sheets have been traced, and 2 copies of each supplied. The traces fell on 1,003 sheets and so 2,006 copies were issued.

160. As regards reproduction for attestation purposes the following work was done during the year :—

District.			Number of sheets.	Number of copies supplied.
Ranchi	1,082	16,821
Dalbhum	...	...	1,368
Monghyr	..	...	2,390
Bhagalpur	...	...	682

In the Sonthal Parganas, out of 150 sheets sent for reproduction, two copies each of the 14 fit for direct reproduction, were issued; the remaining 136 sheets were, owing to colours and stains occurring on them, unfit for direct reproduction and were sent back to the Settlement Officer.

The Director of Land Records is taking steps to avoid a recurrence of this occurrence and I have sent him details by which the Settlement Officer, Sonthal Parganas, will be able to dispense with tracing for attestation in future.

161. The work in Balasore District has been completed during the year; the programme consisted of the correction of 2 vandyked copies of each of the original village maps according to settlement traces. The section has corrected during the year 5,626 copies of the maps of 2,239 villages, the total to date being 8,712 copies of 3,593 villages. Of 7 villages (on 7 sheets) in this District no vandyked reproductions had been made; 10 copies of each of these were supplied.

162. In addition to the original programme this section has dealt with the following miscellaneous items:—

	Number of maps reproduced.	Number of copies.
For the Officer in charge, Calcutta Suburbs Survey, (Suburban area)	701	7,150
For the Officer in charge, Calcutta Suburbs Survey (Index map)	1	30
For the Chairman to the Corporation, Calcutta ...	15	750
For the Manager, Delang Wards Estate, Puri District	99	99
For the Executive Engineers Champaran and Brahmini-Byturni Division	98	98
For the District Engineer, Monghyr ..	4	4
For the Special Officer for Revision of Boundary Commissioners' Lists of 24-Parganas (2 thanas)	Nil	400
For the Officer in charge No. 4 Party specimen map for Amins in Hindi	1	1,000
For the Officer in charge No. 4 Party specimen map for Amins in English	1	100
For the Officer in charge No. 4 Party specimen 4" mujmili map for Cadastral Inspectors ...	1	100
Total ...		9,731

163. One hundred and eighty-five original sheets of District Ranchi (1903-04) and 1,297 of District Purnea (1904-05) were touched up for direct reproduction in this section during the year.

Badar Section.

164. During the year the "badars" of 2 villages of Monghyr, 208 of Bhagalpore, 1,745 of Purnea, 550 of Ranchi and 163 of Singhbhum have been received and corrected on the original maps; the "badars" of 453 villages of Midnapore have been received and, of these, 423 have been dealt with.

165. The headings and adjoining villages names have been corrected according to the numbering and spelling given in thana lists on 3,108 sheets of Purnea, 123 of Bhagalpur, 182 of Monghyr, 435 of Midnapore, 1,134 of Singhbhum and 2,055 of Ranchi.

166. Village names have been corrected and thana numbers entered for 112 villages of Muzaffarpur and 180 villages of Darbhanga, in the traverse volumes, and, in the field books, of 402 villages in Muzaffarpur. This work has not progressed as rapidly as it might have owing to the large amount of touching up of original sheets for reproduction and inking of scales which has been required to be done for Bengal and Eastern Bengal.

167. The touching up for reproduction of 773 sheets of Midnapore, 1,134 of Singhbhum and 1,044 of Ranchi has been completed; and scales have been inked on 2,247 sheets of Purnea and 66 of Ranchi; thana lists for 918 villages of Singhbhum have also been made.

Map Record Section.

168. In accordance with the orders of the Board of Revenue, estimates have been submitted during the year for safe-guarding records against fire and the ravages of insects, &c. The proposals include the substitution of iron for wood in the existing record racks, the enclosing with iron bars of the actual part of the room in which records are kept from that in which record-keepers do their clerical work, the laying on of an unfiltered water-supply with the necessary apparatus for extinguishing fire and lastly the provision of telephonic communication with the headquarters of the Calcutta Fire Brigade.

169. During the year 4,854 original sheets of Bengal and Eastern Bengal have been received making a total to date of 101,715 sheets, of which 88,695 have been racked, the rest are at present in use in different sections of the office in which they are locally racked.

170. Lists (either Thanawar or Parganawar) have been prepared for 25,157 sheets during the year; the total dealt with so far being 89,590 sheets;

lists of the balance in the office are either in course of preparation or will be compiled as soon as the thana lists are received.

171. Serial numbers have been pasted on 23,014 sheets during the year, 74,596 having been dealt with up to date; this work is proceeding rapidly and steadily. 10,811 sheets have been repaired with cloth and 16,102 paper traces with lists complete have been stored in the section during the year; in all 37,624 paper traces have now been stored.

172. I hope shortly to make arrangements by which Eastern Bengal and Bengal sheets may be racked separately in the office, but am not yet ready to put forward detailed suggestions.

CHAPTER III.

PART I—TOURS OF THE SUPERINTENDENT, PROVINCIAL SURVEYS, BENGAL.

173. Major Crichton took the field at the end of October 1906 and between then and the date on which he went on leave visited and inspected each section working under him at least once. As I took over charge towards the close of field season, I was unable to inspect each section before going into recess, but, during a mousoon tour of 7 weeks during July and August, I visited each office under me and also inspected the maps of Ranchi and Singhbhum made by the Settlement Officer, Chota Nagpur. I hope next field season to be able to do a considerable amount of field inspection, but this depends on whether I am allowed a personal assistant or not; suggestions have been put forward by the Board for the provision of a Personal Assistant.

PART II—SERVICES OF OFFICERS.

174. Amongst the executive officers I specially commend to the notice of the Board Mr A. W. Smart; as the officer in charge No. 6 party, his work has fallen partly in Bengal and partly in Eastern Bengal; in Bengal he has so far carried out the Sunderbans Survey with conspicuous success; his former services in Revenue work are well known and need no comment.

Messrs. R. B. Smart (Officer in charge, Calcutta Suburbs Survey), L. F. Berkeley (Officer in charge, Bengal Drawing Office) and N. Bedford, (Officer in charge, No. 4 party), have all done excellent work, whilst Mr. C. S. Kraal has worked well as the Officer in charge No. 5 party.

Amongst the junior officers I would draw the attention of the Board to the services of Mr. P. F. Delaney who has held charge of the Sunderbans Survey Camp throughout the year; Mr. Delaney is a most promising officer.

With one exception the remaining officers have all worked well; the exception has since been transferred from Bengal Surveys.

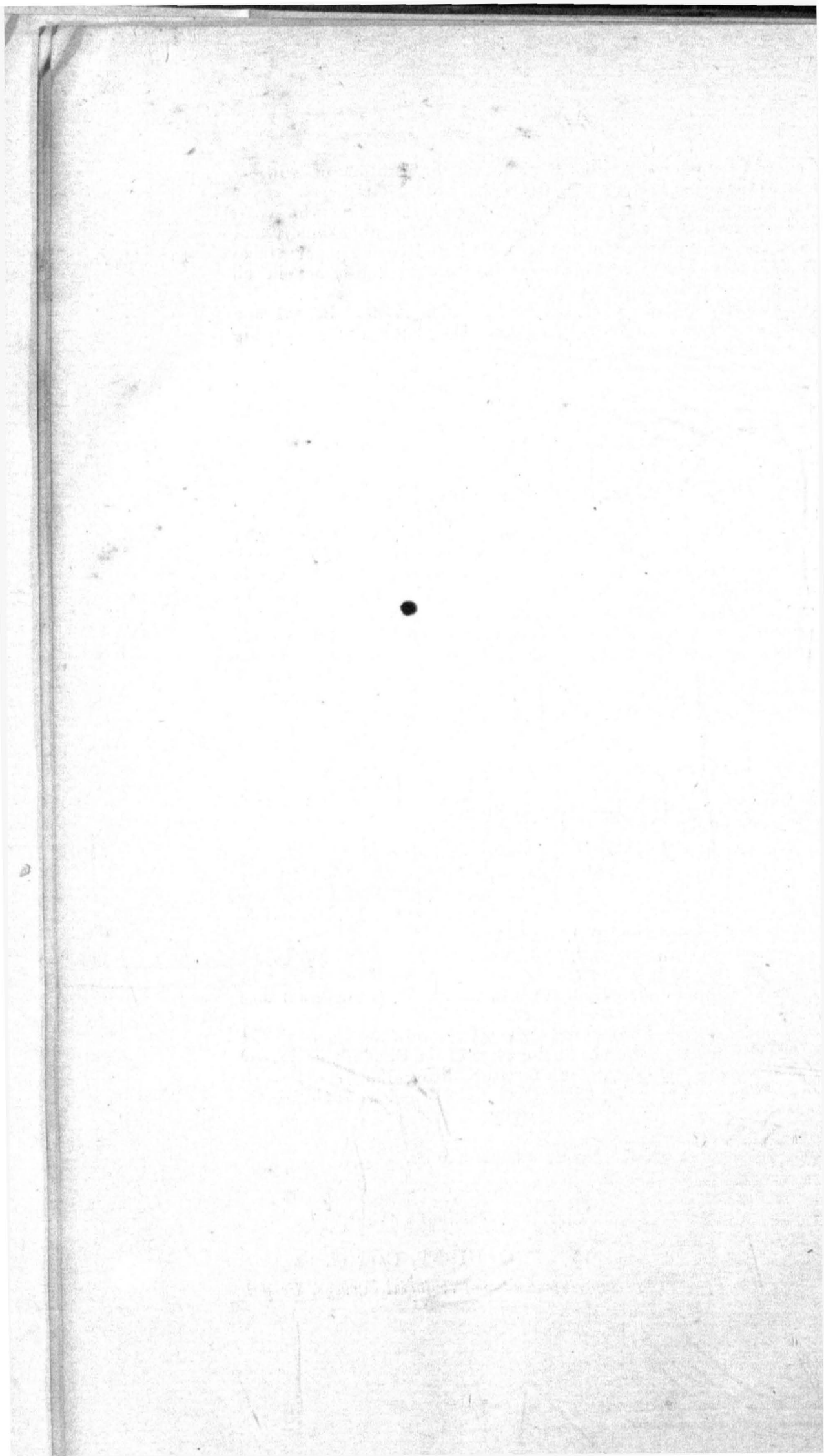
I have the honour to be,

SIR,

Your most obedient servant,

F. C. HIRST, CAPTAIN, I.A.,

Offg. Superintendent of Provincial Surveys, Bengal.



APPENDIX I—PART A.

Summary of outturn of work of the Survey Parties in Bengal for 1906-1907.

DISTRICTS	TRAVERSING.					CADASTRAL SURVEY.				RECORD-WRITING.		TOPOGRAPHICAL SURVEY.
	Number of villages.	Linear miles of chain- ing.	Number of stations at which the theodolite was set up.	Number of azimuths.	Number of sub- traverses.	Villages.	Fields.	Linear miles of test survey.	Sheets.	Villages.	Fields.	Square miles. (a)
1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Private Estates.</i>												
Monghyr	1,143	3,283	15,284	79	1,086	1,151	936,429	} 4,636	2,284	1,151	936,429	...
Ditto Hill block ...	5	117	1,550	4	50	39	6,239		103	39	6,239	...
Patna	1,453	3,379	16,165	62	952	...	...	...	...	...	...	...
Bhagalpur ... ..	...	...	...	...	...	204	245,167	1,238	676	207	337,697	...
Puri	95	430	1,455	14	126	...	...	...	...	...	...	...
Midnapore	48	96	507	6	23	...	...	...	...	...	...	...
Ranchi	707	3,568	17,516	128	994	...	...	...	...	...	...	...
Singbhum	573	2,082	15,410	102	619	...	...	...	...	...	...	...
Sonthal Parganas ...	1,355	3,293	14,997	81	791	...	...	...	...	...	...	...
24 Parganas—Sundarbans	(c) 32	677	2,347	61	(b)	...	...	...	...	...	...	638
Khulna ditto ...	(c) 45	1,105	4,757	124	(b)	...	...	...	...	...	...	953
<i>Miscellaneous.</i>												
Bhagalpur, Colgong Municipality	5	...	265	...	...	5	2,542	...	...	5	2,542	...
Ditto Mawalikabad ...	1	...	...	...	...	1	...	...	...	1	...	...
Ditto Kosi Diara ...	2	...	...	...	...	2	...	...	...	2	...	...
Purnea ditto ...	13	...	...	...	...	13	...	...	...	8	...	...
Total	5,477	18,030	90,253	661	4,641	1,415	1,190,877	5,874	3,063	1,413	1,282,907	1,591

(a) This work is not Cadastral Topographical Survey, and therefore square miles have been substituted for the old heading "Villages."

(b) True Topographical work cannot be given.

(c) Blocks, not villages.

F. C. HIRST, CAPTAIN, I.A.,
Offg. Superintendent of Provincial Surveys in Bengal.

APPENDIX I—PART B.

Statement of Outturn and Cost-rates.

DISTRICT AND ESTATE.	Description of work.	Estimated area to be dealt with in square miles.	Year of inception of operations.	AREA SURVEYED IN SQUARE MILES.		COST-RATE PER SQUARE MILE.		Balance of area remaining to be surveyed.	Estimated cost of completing the area in column 9.	Estimated final cost rate per square mile.	REMARKS. [Explanation of unusually high expenditure.]
				During the year under report.	Total including previous years.	During the year under report.	From beginning to end of the year under report.				
1	2	3	4	5	6	7	8	9	10	11	12
<i>Private Estates.</i>											
Monghyr ...	Traverse ...	2,132	1905	(a) 1,190	2,132	Rs. 35·9	Rs. 38·1	Nil	Nil	38·1	(a) Includes 275 square miles triangulation area for topographical work and also 8 square miles of Government estate previously surveyed but re-traversed.
	Cadastral ...	2,132	1906	(b) 1,307	1,307	53·0	53·0	Nil	(g)	(g)	
	Records ...	2,132	1906	(b) 1,307	1,307	52·0	52·0	Nil	(g)	(g)	
	Triangulation ...	275	1906	(c) 275	275	...	...	Nil	(h)	(h)	
Patna ...	Traverse ...	2,075	1906	(d) 852	852	(f) 34·2	34·2	1,223	41,800	34·2	(c) Also included in (a).
Bhagalpur ...	Cadastral ...	3,572	1902	375	3,572	61·1	66·4	Nil	...	66·4	(d) Includes 22 square miles of old scattered work re-traversed.
	Records ...	3,572	1902	538	3,572	48·4	59·5	Nil	...	59·5	(e) Included in area previously reported in former report.
Puri (Chilka lake) ...	Traverse ...	97	1906	97	97	49·1	49·1	Nil	...	...	(f) Includes cost of Monghyr triangulation.
Midnapore (Dalbhum) ...	Do. ...	15	1906	15	15	24·8	24·8	Nil	...	...	(g) Depends on the rates at which the Settlement Department works.
Rauchi ...	Do. ...	7,081	1901	1,128	5,926	37·3	34·7	1,155	40,400	34·5	(h) Expenditure is being included in the ordinary traverse programme.
Singhbhum (Dalbhum) ...	Do. ...	1,173	1905	601	1,173	30·4	33·6	Nil	...	33·6	
Sonthal Parganas ...	Do. ...	1,604	1905	807	1,604	26·6	31·8	Nil	...	31·8	
24 Parganas-Sundarbans	Do. ...	1,688	1905	688	1,688	47·2	49·2	Nil	...	49·2	
Khulna (Sundarbans) ...	Topographical 4" ...	1,233	1905	688	1,232	28·8	30·9	Nil	...	30·9	
	Traverse ...	2,003	1906	953	953	58·2	58·2	1,050	61,110	58·2	
	Topographical 2" ...	2,003	1906	953	953	34·7	34·7	1,050	36,440	34·7	
<i>Miscellaneous.</i>											
Calcutta Suburbs Survey (Port Commissioners' area).	Traverse ...	2	1906	2	2	...	...	Nil	...	...
	Detail ...	2	1906	1	1	...	...	1	...	...
Bhagalpur (Colgong Municipality).	Traverse ...	2	1906	2	2	...	...	Nil	...	...
Bhagalpur Mawalikabad ...	Traverse and Cadastral.	1	1906	1	1	...	...	Nil	...	...
Do. Kosi Diara ...	Ditto ...	2	1906	2	2	...	...	Nil	...	...
Purnea Ditto ...	Ditto ...	21	1906	(e) 21	21	...	...	Nil	...	...
Totals	Triangulation ...	275	...	...	...	...	...	...	...	...
	Traverse ...	6,309	...	...	...	...	...	...	...	...
	Cadastral ...	1,683	...	...	...	...	...	...	...	...
	Records ...	1,845	...	...	...	...	...	...	...	...
	Topographical ...	1,591	...	...	...	...	...	...	...	...

F. C. HIRST, CAPTAIN, I.A.,

Offg. Superintendent of Provincial Surveys in Bengal.

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APPENDIX II.

Statement of sums expended.—For the year ending 30th September 1907.

DISTRICT, ETC.	Description of work.	EXPENDITURE INCURRED DURING THE YEAR UNDER REPORT.				TOTAL EXPENDITURE FROM INCEPTION TO END OF THE YEAR UNDER REPORT.			
		Actual (direct) cost.	Share of Superintendent of Provincial Surveys, pay and cost of his office.	Four per cent. charge for instruments.	Total.	Actual (direct) cost.	Share of Superintendent of Provincial Surveys, pay and cost of his office.	Four per cent. charge for instruments.	Total.
1	2	3	4	5	6	7	8	9	10
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bhagalpur ...	Traverse ...	1,370	75	58	1,503	97,813	5,279	4,123	1,07,215
	Cadastral ...	20,875	1,144	881	22,900	2,14,857	13,237	9,123	2,37,217
	Records ...	23,743	1,298	1,002	26,043	1,92,140	12,290	8,176	2,12,606
Monghyr ...	Traverse ...	29,969	1,602	1,263	32,834	64,709	3,447	2,726	70,882
	Cadastral ...	63,224	3,440	2,666	69,330	63,224	3,440	2,666	69,330
	Records ...	62,012	3,390	2,616	68,018	62,012	3,390	2,616	68,018
Patna ...	Traverse ...	26,570	1,435	1,120	29,125	26,570	1,435	1,120	29,125
Sonthal Parganas ...	Do. ...	19,616	1,058	827	21,501	46,547	2,485	1,961	50,993
Ranchi ...	Do. ...	38,332	2,070	1,616	42,018	1,88,478	10,303	6,793	2,05,574
Singhbhum—Dalbhum ...	Do. ...	16,677	913	704	18,294	36,774	1,978	704	39,456
Midnapore Ditto ...	Do. ...	341	17	14	372	341	17	14	372
24 Parganas—Sunderbans ...	Traverse for topo. ...	28,565	1,536	...	30,101	78,888	4,203	...	83,091
	Topo. 4" ...	17,443	957	...	18,400	36,197	1,948	...	38,145
Khulna Ditto ...	Traverse for topo. ...	50,588	2,742	2,133	55,463	53,588	2,742	2,133	55,463
	Topo. 2" ...	30,142	1,648	1,272	33,062	30,142	1,648	1,272	33,062
<i>Miscellaneous.</i>									
Calcutta Suburbs Survey, including Revenue work and Panchanagram.	Traverse ...	928	50	...	978	64,522	3,379	...	67,901
	Cadastral ...	28,213	1,545	...	29,758	1,33,953	7,301	...	1,41,254
	Records ...	8,977	488	...	9,465	34,790	1,761	...	36,551
Patna—Diara ...	Traverse ...	111	6	5	122	4,936	234	206	5,376
Purnea—Kosi Diara ...	Traverse ...	395	17	16	428	395	17	16	428
	Cadastral ...	1,433	77	60	1,570	1,433	77	60	1,570
	Records ...	279	14	12	305	279	14	12	305
Bhagalpur—Kosi Diara ...	Traverse ...	450	23	19	492	450	23	19	492
Darjeeling—Nepal Boundary ...	Do. ...	887	46	37	970	2,923	153	123	3,199
Monghyr—Binda diara ...	Cadastral ...	33	2	1	36	33	2	1	36
Bhagalpur, Municipality arrears ...	Do. ...	1,831	79	76	1,986	2,017	89	83	2,189
Bhagalpur, Colgong Municipality arrears	Traverse ...	524	27	22	573	524	27	22	573
Monghyr, Jamalpur Municipality arrears.	Cadastral ...	6	...	...	6	6	...	...	6
Monghyr—Hill blocks ...	Topo. 2" ...	5,779	313	244	6,336	5,779	313	244	6,336
	Cadastral ...	1,155	62	48	1,265	1,155	62	48	1,265
	Records ...	490	25	20	535	490	25	20	535
Bhagalpur—Arrears ...	Cadastral ...	299	16	12	327	299	16	12	327
	Records ...	5,874	317	248	6,439	5,874	317	248	6,439
Do. Budars ...	Cadastral ...	2,891	152	122	3,165	2,891	152	122	3,165
Monghyr do ...	Do. ...	292	15	12	319	292	15	12	319
Purnea—Arrears ...	Cadastral ...	2,652	90	110	2,852	21,038	1,064	884	22,986
	Records ...	1,015	53	42	1,110	1,015	53	42	1,110

APPENDIX II—concluded.

Statement of sums expended. For the year ending 30th September 1907—concluded.

DISTRICT.	Description of work.	EXPENDITURE INCURRED DURING THE YEAR UNDER REPORT.				TOTAL EXPENDITURE FROM INCEPTION TO END OF THE YEAR UNDER REPORT.			
		Actual (direct) cost.	Share of Superintendent, Provincial Surveys' pay and cost of his office.	Four per cent. charge for instruments.	Total.	Actual (direct) cost.	Share of Superintendent, Provincial Surveys' pay and cost of his office.	Four per cent. charge for instruments.	Total.
1	2	3	4	5	6	7	8	9	10
<i>Miscellaneous—concluded.</i>		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Purnea—Padars ...	Cadastral ...	3,162	166	133	3,461	3,162	166	133	3,461
Bhagalpur—Kosi diara Arrears	Do. ...	103	6	4	113	103	6	4	113
	Records ...	94	5	4	103	94	5	4	103
Puri—Jagir Mahals ...	Traverse ...	4,345	237	184	4,766	4,345	237	184	4,766
Singhbhum—Demarcation of boundary between Dalbhum Estates and Mourbhanj Estates.	Traverse ...	610	31	26	667	610	31	26	667
Udaipore Political (Boundary Estates. Survey.	Traverse ...	600	30	26	656	600	30	26	656
Raachi—Arrears ...	Cadastral ...	647	32	27	706	2,733	143	115	2,991
Midnapur—Jalamutha and Majnamutha Arrears.	Cadastral ...	516	26	22	564	516	26	22	564
Midnapur—Nayabashan and Rohini Arrears.	Traverse ...	514	26	...	540	514	26	...	540
Singhbhum—Seraikela and Kharsawan—Arrears.	Cadastral ...	352	17	15	384	2,126	111	89	2,326
Total	Traverse ...	2,21,392	11,941	8,070	2,41,403	6,70,527	36,046	20,196	7,26,769
	Cadastral ...	1,27,684	6,869	4,189	1,38,742	4,49,838	25,907	13,374	4,89,119
	Records ...	1,02,484	5,590	3,944	1,12,018	2,96,694	17,855	11,118	3,25,667
	Topographical ...	53,364	2,918	1,516	57,798	72,118	3,909	1,516	77,543
	Standard maps ...	14,321	780	...	15,101	85,035	4,920	...	89,955
	Traverse chart ...	868	45	...	913	868	45	...	913
	Record section ...	2,825	150	(e)119	3,094	16,974	863	119	17,956
	Badar section ...	5,364	285	(e)226	5,875	18,638	1,050	226	19,914
	Thana maps ...	3,253	172	(e)137	(a)3,562	11,390	671	137	12,198
	District maps ...	582	27	(e)24	633	582	27	24	633
	Trijunction mark maps.	1,796	95	(e)76	(b)1,967	5,522	276	76	5,874
	Reproduction for attestation.	6,079	330	(e)256	6,665	12,627	662	256	13,545
	Reproduction of village maps.	58,312	3,176	(e)2,459	(e)63,947	3,21,466	17,808	2,459	3,41,733
	Correction of copy Orissa maps.	2,619	143	(e)110	2,872	3,205	174	110	3,489
	Correction and touching up of maps of Midnapore.	332	16	(e)14	362	332	16	14	362
	Preparation of 2" Mujmulli maps of Singhbhum.	116	6	(e)5	127	116	6	5	127
	Extra Departmental work.	1,706	87	(e)72	(d)1,865	3,612	188	72	3,872
	GRAND TOTAL ...	6,03,097	32,680	21,217	6,56,944	19,69,544	1,10,423	49,702	21,29,669

(a) Includes work done for Director of Land Records Bengal.

(b) Of Bihar, Orissa, Singhbhum and Ranchi.

(c) Sonthal Parganas, Bihar, Ranchi and Midnapore.

(d) Copies of maps, &c., supplied to applicants on payment.

(e) Four per cent. for instruments charged under orders of Comptroller General.

F. C. HIRST, CAPT., I.A.,

Offg. Superintendent of Provincial Surveys in Bengal.

REVENUE DEPARTMENT.

LAND REVENUE.

CALCUTTA, THE 9TH APRIL 1908.

RESOLUTION—No. 2136L.R.

READ—

The Survey and Settlement Reports for the year ending the 30th September 1907, with the remarks of the Board of Revenue thereon.

The Reports of the Superintendent of Provincial Surveys and the Director of Land Records for the year ending the 30th September 1907, which were due on the 15th January, did not reach Government until the 2nd March. The Settlement Report has slightly exceeded the prescribed maximum limit of pages. A narrative of the revisional settlement operations started during the year in Orissa is an important new item, while the transfer of the control of cadastral operations from the Survey of India to the Settlement Department has further added to the subject matter; but it should be possible to curtail the Report in other directions by eliminating minor details, and by giving less space to small settlements.

2. The operations of the Survey and Settlement Departments extended over fourteen districts in all parts of Bengal. But the bulk of the work was done by the Settlement Officers of Bihar, Chota Nagpur and the Sonthal Parganas, who were engaged, respectively, in (1) Monghyr and Bhagalpur, (2) Ranchi and Dhalbhum, and (3) the Sonthal Parganas. The programme was adhered to very closely. The outturn, as shown in the margin, greatly exceeded that of the previous year. The total area for which a record-of-rights has been prepared in Bengal is now close on 40,000 square miles. The Superintendent of Provincial Surveys is still in charge of operations both in this Province and in Eastern Bengal and Assam. This is not a satisfactory arrangement, and a scheme for separation is now being considered.

	1905-06.	1906-07.
	Sq. m.	Sq. m.
Traverse survey	5,591	6,309
Cadastral "	3,676	4,176
Topographical "	1,095	1,591

3. The Lieutenant-Governor is glad to notice a progressive decline in the expenditure on survey and settlement operations. The cost-rate of traverse survey was nearly stationary in Ranchi, but in Dhalbhum it fell from Rs. 36·9 to Rs. 30·4 per square mile. There was an apparent rise in Monghyr, but this was due to extra triangulation carried out for topographical purposes. There was a much more noticeable reduction in the cost of cadastral survey and initial record-writing. This work was still being done by the Survey Department in the districts of Bhagalpur and Monghyr. In the former, the cost-rate fell from Rs. 134·7 to Rs. 109 per square mile, while in the latter, where the work was newly started, it was only Rs. 105. In the district of Ranchi where for the last two years, the system has been introduced of carrying on cadastral operations through the agency of the Settlement Department assisted by a Survey Department officer as professional adviser, the cost-rate was still lower. It was Rs. 86·24 as against Rs. 89·52 in 1905-06, and an average of more than Rs. 100 in the previous years when the work was still in direct charge of the Survey Department. The average of these previous years was of course affected by the heavy expenditure which has to be incurred on buildings, tents and other non-recurring charges at the beginning of a settlement. This is exemplified in the case of Singhbhum where the reported cost-rate of 1906-07 is Rs. 124, but a much smaller rate is anticipated for the area completed in the current field season. On the other hand, the rates of the Settlement

Department have it to their credit that they include the cost of supervision of initial record-writing by Revenue Officers which was excluded from the Survey Department rates. On the whole, the Lieutenant-Governor is satisfied that the new system has been a success, and he endorses the remark of the Director that the lowness of the cost-rate is highly creditable to the Settlement Officer. It is hoped that equally satisfactory results will be attained in the Bihar districts, where the same system of cadastral survey control has been introduced from October 1907.

4. The settlement operations in Chota Nagpur have resulted in the accumulation of a mass of information regarding the local agrarian conditions and customs and the main causes of dispute between landlord and tenant. The existing law has been carefully reviewed in the light of this information, and a Bill has been drafted which it is hoped shortly to introduce into Council, and which, when passed, may be expected to provide a satisfactory settlement of this troublesome subject. Paragraphs 109, 111, 122 and 123 of the Report under review contain some interesting remarks regarding occupancy and jungle rights, rents, village headmen, etc.

5. During the attestation proceedings in South Bhagalpur it was found that illegal enhancements had been made almost universally whenever an estate had changed hands. In many cases they were defended on the ground of landlords' improvements, but the rents had been enhanced to such an extent that the outlay on the improvement was very speedily recouped. In one case, after the issue of the notification under section 101 (1) of the Bengal Tenancy Act, ordering the survey and the preparation of a record-of-rights, the landlord moved the Civil Court under section 158 (1) (d) for a declaration of the rent payable, and induced the raiyats to agree to an illegal enhancement. The Civil Court accepted the compromise without enquiry. In future such proceedings will be prevented by the amending Act of 1907 (Bengal Act I of 1907).

The prevalence of the farming system of estate management was a special difficulty in South Bhagalpur, as it raised complicated problems of status and rent enhancement. The difficulty arose in a more intense form in South Monghyr where it was left to be disposed of in the attestation of the following year. A new feature of the work was the preparation of a special irrigation record to which considerable attention was given.

6. Settlement of fair rents in the district of Purnea resulted in a moderate enhancement of 8.62 per cent. It was allowed mainly on the ground of a rise in prices. The settlement of rents in the Balarampur estate of the Midnapore district caused an increase of 57 per cent. in the rent-roll. The main portion of the enhancement was derived from the reassessment of tenureholders who had enjoyed without alteration of their rents all the profits of the extensive reclamation that had occurred in the estate since the previous settlement. The enhancement was eased off in the majority of cases by progressive assessment. Raiyats' rents were enhanced by 3 annas in the rupee which was more than justified by the rise in prices. Proposals were submitted during the year for the assessment of the large temporarily-settled estates of Jallamutha and Majnamutha which are now under direct management. Here also it has been decided to take an enhancement of 3 annas in the rupee on the ground of rise in prices.

7. The recovery of costs was stopped in Purnea in consequence of loss of crops caused by floods. Out of a total demand of Rs. 7,18,639, only Rs. 50,822, which was voluntarily paid by landlords, was realized. In Ranchi the full demand of the year (Rs. 1,66,569) was collected; and the Lieutenant-Governor observes with satisfaction that recourse to the certificate procedure was necessary for only Rs. 736 payable by landlords.

8. The revision of the records of the last settlement of Orissa, with a view to their continuous maintenance, was commenced in Balasore in December 1906. The progress was very slow. This was due in a great measure to sickness amongst the subordinates, the novelty of the work and the inexperience of most of the supervising staff. But it was also due in part to over-elaboration in the initial record-writing, which seriously retarded attestation. A simpler procedure has now been prescribed, and the staff has been reorganized. It is hoped that this will ensure more rapid progress in future.

The maintenance of records in Sambalpur was carried on satisfactorily. The present Report shows some improvement in the record of mutations and inspection of rent-rolls of Government estates; but in Wards' estates there was a falling-off as compared with the previous year. The Board of Revenue will shortly issue revised rules on this subject.

9. The Lieutenant-Governor has read with pleasure the remarks made by the Director of Land Records regarding the extended use which is being made of settlement records by the Courts and Executive officers of Government. It is stated that they are now freely referred to by the Civil and Criminal Courts, and are generally accepted as presumptive evidence of the facts recorded in them. They form the basis of management in all Government and Wards' estates. The thana index-maps, which are compiled from the village cadastral maps, have been found most useful for District Board work, for the reorganization of Chaukidari Unions and for many other administrative purposes. In Ranchi it is said that no case relating to land is now disposed of without reference to the settlement records, and that the decisions of attestation officers as to rents and rates of rent are seldom contested. With regard to this district, it is also stated that the raiyats are now realizing fully the benefits of the settlement operations, and are understanding the rights which have thereby been secured for them. In the districts of Purnea, Shahabad and Singhbhum, however, the officers of the Registration Department do not appear to have insisted, as elsewhere, upon the description of lands by survey plot numbers in documents presented for registration. This will be brought to the notice of the Inspector-General of Registration. Steps are being taken to ensure similar identification of lands in civil suit plaints, sale certificates, etc. The system of deputing a few Munsifs every year to settlement work is being attended with very satisfactory results. The main object is of course to give them a practical knowledge of settlement procedure, and thereby to lead to a better appreciation of the record-of-rights in the Civil Courts. But apart from this, most of the Munsifs have proved most useful Assistant Settlement Officers.

10. The inspection and restoration of boundary-marks received considerable attention during the year, but a large number of damaged or missing marks still remain to be restored. Efforts should be made to have all such marks restored without undue delay.

11. The Lieutenant-Governor has already placed on record his appreciation of Major Crichton's valuable services during the sixteen years for which he was in the Bengal Provincial Survey Department. He was succeeded, in March 1907, by Captain F. C. Hirst, who has made an excellent start. The post of Director of Land Records was held successively by Messrs. Lister, Kerr and McPherson. His Honour's acknowledgments are due to these officers, and also to Messrs. Reid, Allanson, Murphy, and Taylor, and to the other officers named in the concluding paragraphs of the two Reports.

12. Extracts from the two Reports are published for general information.

ORDER.—Ordered that this Resolution be published in the *Calcutta Gazette*, and that a copy of it, with copies of the two Reports and the Board's note, be submitted to the Government of India.

By order of the Lieutenant-Governor of Bengal,

E. A. GAIT,

Chief Secy. to the Govt. of Bengal.

No. 2137.

COPY, with copies of the two Reports, forwarded to the Surveyor-General, India, for information.

No. 2138.

COPY, with copies of the two Reports, forwarded to the Political Department of this Government, for information.

(4)

No. 2139.

COPY, with a copy of the Settlement Report, forwarded to the Appointment Department of this Government, for information, with special reference to paragraph 11 above.

No. 2140.

COPY, with a copy of the Settlement Report, forwarded to the General Department of this Government for the favour of necessary action with reference to paragraph 9 above.

By order of the Lieutenant-Governor of Bengal,

A. H. LEY,

Under-Secy. to the Govt. of Bengal.

CALCUTTA;
The 9th April 1908.

(41) Enc

