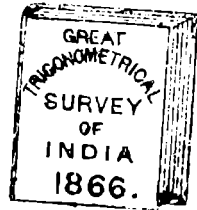


REPORT
ON THE
REVENUE SURVEY OPERATIONS
OF THE
LOWER PROVINCES,

FOR SEASON

1864-65.



BY

LIEUT. COL. J. E. GASTRELL,
OFFG. DEPT. SURVEYOR GENERAL, AND SUPDT. OF REVENUE SURVEYS.

CALCUTTA:

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No. 10.

FROM

LIEUT. COLONEL J. E. GASTRELL,
Offg. Deputy Surveyor General of India,

TO

R. B. CHAPMAN, Esq.,
*Secretary to the Board of Revenue,
 Lower Provinces.*

Annual Report on the Revenue Survey Operations, Lower Provinces, No. 30, dated 29th instant, for the Professional Season 1864-65, forwarded for the information of the Board of Revenue, and for submission to Government of Bengal.

J. E. GASTRELL, *Lieut. Colonel,*
Offg. Deputy Surveyor General of India.

DY. SUR. GENL.'S OFFICE ;
 CALCUTTA,
 29th January 1866. }

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GENERAL REPORT

ON THE

REVENUE SURVEY OPERATIONS OF THE LOWER PROVINCES

FOR

SEASON 1864-65.

No. 30,—Dated Calcutta, 29th January 1866.

1. The following Report embraces the operations of the Professional Survey Parties attached to the Lower Provinces for the survey year commencing 1st October 1864 and closing on the 30th September 1865, and the changes that have occurred during that period.

2. In April 1865 the Surveyor General, Colonel Thuillier, who for many years had, almost unaided, superintended and directed the various Establishments, was obliged to seek in Europe the rest which he had long felt he needed from his arduous and indefatigable labors.

His place in the Revenue Surveys was taken by Lieutenant Colonel Robinson, R. E.,* who again in his turn, and on appointment to the direction of the Telegraph Department, made over charge to me† on the 24th July 1865, as per orders of Government of India marginally cited.

3. The total area surveyed, mapped, and recorded during the past year in the districts marginally noted amounts to square miles 7,857, of which 6,758 square miles, containing 6,094 villages and 478 grants, estates, and unallotted blocks, are mapped on the large scale of 4 inches = 1 mile, and the remainder, 1,099 square miles, on the smaller scales of 2 inches and 1 inch = 1 mile respectively.

4. The total expenditure of the year amounts to Rs. 3,49,657; the mean rates of the different kinds of survey are as follows:—

AREA.		Rs. A. P.	
Noncolly. Maunbhoom. Sylhet. Cachar. Saram. Champaran. Goruckpoor. Patna.	Tirhoot. West Doonrs. Lohardugga. Hazareebaugh. Darjeeling. Sebsaugur. Kamroop. Chittingong.	Village survey, large scale ... { Per mile ... 40 2 8 Per village ... 34 6 2	
COST AND RATES.		Waste lands, &c., ditto Per acre ... 0 2 7	
		Topographical Survey, small scale, Per sq. mile ... 30 14 11	

Comparing these results with those of the previous season, we obtain the following:—

Seasons.	No. of Villages.	Area in Square Miles.	Total Cost.		Rate per Square Mile.		Rate per Village.	
			Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
Grand Total of 1863-64 ...	5,916	9,915	3,54,763	2 10	(a) 32 3 0	(b) 40 0 0	40 0 0	40 0 0
Ditto of 1864-65 ...	6,094	7,857	3,51,743	10 8	39 0 9	34 10 8	34 10 8	34 10 8
Differences	+ 178	- 2,058	- 3,019	8 2	+ 6 13 9	- 5 5 4	- 5 5 4	- 5 5 4

Exclusive of the waste land surveys.
Exclusive of the topographical and waste land surveys.

5. The decrease in area, when compared with that of season 1863-64, is caused by the transfer of the 5th Division, Lower Provinces, from the Tipperah Hills to the Bengal Dooars, whereby a large portion of the field season was unavoidably lost. In 1863-64 this Party completed 3,500 square miles of rough hill topography, whilst in 1864-65 it could only, and that with difficulty, complete 175 square miles of the Dooars. The total area accomplished by the other surveys shows an increase of 1,272 square miles over that of 1863-64. The comparison is therefore in favor of 1864-65.

6. Another district of Bengal, "Bulloah, or Noacolly," has been completed during the year. The last Annual Report contemplated the completion of the Sylhet District also, but this, from various causes set forth in the body of this Report, proved to be impracticable.

7. During the present season the districts of Maunbhoom and Sylhet will both be finished. The survey of Cachar will include all the cultivated portions, and will, it is hoped, penetrate well into the hilly country, which lies to the south of the district, and which, it is believed, will be found hereafter equally well adapted for Tea plantations, as the northern portion of the district. The 2nd Assam Revenue and Topographical Survey, now employed in tracing out the course of rivers and mapping roughly such portions of the Bengal Dooars as are at present little known between Buxa and Dewangiri, will shortly be broken up, and amalgamated with the 1st Division Revenue Survey, now employed in making a complete Revenue Survey of the Kamroop District of Assam; other Surveys will follow the 1st Division, as they finish their labors elsewhere, until the whole of the Assam Districts have been provided for. The district of Palamow will occupy the 6th Division at most another season, and will leave this Party free to take up such fresh work as may be allotted to it.

8. The maps and records prepared by the several Executive Establishments, during the season under review, for this Office and for the Civil Authorities, are detailed in the margin. Most of them have been lodged, and the receipt of the others is daily awaited, their dispatch having been advised.

ORIGINAL MAPS AND RECORDS PREPARED BY REVENUE SURVEYORS.

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9. The following Statement details the progress made in compiling the maps of the Lower Provinces since January last:—

SCALE 4 MILES = 1 INCH.	COMPILATIONS.
Districts Tipperah and Noacolly	... Final map compiled, and very near completion.
„ Chittagong, with hills	... Ditto „ ditto ditto.
„ Maunbhoom	... Ditto
„ Sylhet	... Ditto

} Compiled to the extent of materials received of surveys executed in 1863-64.

SCALE 8 MILES = 1 INCH.	COMPILATIONS.
Districts Jessore and Backergunge, including the surrounding districts of Nuddea, 24-Pergunnahs, and Furreedpoor, also the Soonderbuns.	} Compiled and finished. Ready for lithography.
District Tipperah	} Compiled and finished, and sent to Press for lithography.

SCALE 1 MILE = 1 INCH.

COMPILATIONS.

District Nuddea, in 8 sheets ...	...	{ Projected, and boundaries of Main Circuits outlined, to guide Press Office in copying. This map is now passing through its final proofs and will be published very shortly.
,, 24-Pergunnahs ...	...	{ Projected, and the boundaries of Main Circuits outlined. Will be ready for lithography very soon.

MAPS LITHOGRAPHED AND PUBLISHED. 10. The following maps have been lithographed and published:—

Map of District Akyab,	scale 4 miles = 1 inch.
Ditto Backergunge, „ 4 „ „	
Ditto Tipperah, „ 8 „ „	
Main Circuits 6, 10, 5, 9, 13, 15, and 17 of District Backergunge, „ 1 „ „	
Main Circuits 1, 10, 12, and 17 of District Dinagepoor, „ 1 „ „	
Civil Station of Jessore, „ 8 inches = 1 mile.	

11. For the use of the Superintendent of the Geological Survey, and also for Civil Officers, the following maps on the scale of 1 inch=1 mile have been photographed to scale, and furnished. This process is daily becoming of greater use from the rapidity with which it enables this Office to meet the pressing wants of Officials for maps and plans:—

Main Circuits 2 and 3, District Lohardugga,	scale 1 mile=1 inch, surveyed in 1863-64.
Ditto 4, ditto,	ditto, ditto 1864-65.
Ditto 11, 12, 13, 14, and 15, District Maunbhoom,	scale 1 mile=1 inch, ditto 1863-64.
Ditto 16 and 19, ditto,	ditto, ditto 1864-65.

12. The work of the Boundary Commissioner's Office, and the progress made in the final adjustment of Thannah Sub-Division, District, and Division boundaries in Bengal, are fully detailed in the Report by that Officer, and given in full in Appendix. Lieutenant Colonel D. C. Vaurenen, who has been appointed to officiate as Boundary Commissioner by the Government of Bengal, in Orders of the 7th November 1865, No. 6192, joined his appointment on the 25th November 1865.

1ST OR NORTHERN DIVISION.

LOWER PROVINCES.

13. This Party, as detailed in the margin, commenced field operations early in December 1864, and after completing the survey of the remaining portion of the Noacolly District, returned to recess quarters during the early part of May.

<p>R. B. Smart, Esq., Revenue Surveyor. <i>Assistants.</i> Mr. J. R. Pringle, Assistant Revenue Surveyor, 1st Class. " D. W. Burnett, ditto ditto, 3rd Class. " C. Brownfield, Sub-Assistant ditto, 1st Class, transferred 15th January 1865 to Upper Assam on deputation. <i>Vide</i> G. O. B. G. No. 126, dated 5th January 1865. " J. D. Lynch, Sub-Assistant Revenue Surveyor, 3rd Class. " R. B. Smart, Jr., Junior Sub-Assistant Revenue Surveyor. " W. J. Lane, ditto ditto, appointed 1st March 1865. 35 Native Surveyors, &c.</p>	<p>14. The field of survey extended from the city of</p>
--	--

Noacolly, north-west, west, and south, to the coast line, and thence to the Islands of Dukhin Shabazpore, Hattayah, Sundeeep, Bidon, Siddee, Nutcherra, Baroda, Manpoora, Folcon Chur, and Toom Chur, all appertaining to the Noacolly District, including the numerous channels or estuaries by which the joint streams, Megna, Ganges, and Brahmaputra, empty themselves into the Bay of Bengal.

AREA.		
Land, Square Miles	..	1461.44
Rivers "	..	653.24
Total Square Miles	..	<u>2114.68</u>

15. The gross area surveyed was 2114.7 square miles, but a part of this (*vide margin*) is due to the estuaries above mentioned. The land portion comprising an area of 1461.44 square miles is included in 817 villages.

16. A good junction has been established on the west with the survey of the district of Backergunge, by means of triangles thrown across the Te-toolia River, in connection with temples, &c., the positions of several of which were determined during the survey of that district. The Island of Siddee has similarly been connected with the main land to the north, and the Island of Sundeeep with the Chittagong coast on the east. Further, to facilitate comparison with the former survey of the Chittagong District, the coast line and main road running parallel to it have been re-surveyed from the Feeny River to a distance of thirty miles south. The Great Trigonometrical Survey Station of Seetakoond has also been connected with.

17. The sites of twenty-six temples and masonry buildings of the Noacolly District have also been carefully fixed. These will afford ample means for connecting the Revenue Survey operations with those of the Great Trigonometrical Survey now in progress through the district, and also of thoroughly testing the accuracy of the Revenue Survey measurements.

18. The entire field of survey was divided into seventeen Main Circuits, and these were sub-divided to suit the detail operations, over which a very efficient check was exercised by means of lines of independent survey run across between fixed points and Circuit Stations at regular intervals, the results of which are reported as most satisfactory. Observations for azimuth were taken at twenty-two Stations.

COST AND RATES.		Rs.	A.	P.
• Permanent Establishment	...	95,807	4	1
Contingencies	..	9,725	5	2
		<u>45,532</u>	9	3
Mehalwary charges	..	600	0	0
Total Rs.	..	<u>46,132</u>	9	3

19. The cost of the survey, inclusive of contingencies, amounts to Rs. 45,532-9-3,* yielding the following averages; per square mile Rs. 21-8-6, per village Circuit Rs. 55-11-8. The Mehalwary calculation charges for the season amounted to Rs. 600.

20. All the maps and records have been completed and safely lodged in this Office, whilst duplicate copies of the maps have been furnished to the local Civil Authorities. The mapping performed by this Party, in the execution of which the Revenue Surveyor has, I am glad to observe, taken, as usual, a leading part, maintains its character for excellence of style and finish, and having been entirely drawn in pen and ink is suited for reproduction by photolithography, or for reduction by photography. As far as it is possible to judge from the recorded professional results of this survey, compared with those of the surveys of adjoining districts, the work under Mr. Smart's supervision appears to have been well and carefully performed.

21. Throughout the whole of the operations of this Party in these eastern districts of Bengal, the utmost harmony has prevailed between the Civil and Professional Departments. This is testified by the following extract of a letter from the Civil Superintendent of Surveys, Mr. Browne, to the address of the Revenue Surveyor, on the completion of their joint labours:—

Extract.

“I must take this final opportunity of saying that I shall always look back with the greatest pleasure to the time during which our duties have brought us together. We have together completed the survey of the two districts, and the good understanding which has always existed between us has never once been disturbed. I feel sure that the pleasant experience I have had of the great advantages derivable from concord between two independent Departments will be of great use to me in my future career.”

The demarcation maps were all most satisfactorily prepared, and the accordance between the boundaries of the Civil and Professional Surveys is certified to have been good.

22. Some interesting information regarding the rivers and islands at the mouths of the Megna, and given by the Surveyor in his Annual Narrative Report of operations, will be found in the Appendix to this Report.

GENERAL REMARKS BY SURVEYOR ON THE GEOGRAPHY, &c., OF THE DISTRICT.

ESTABLISHMENT.

* *Vide* paras. 140 and 141 of General Report on the Revenue Survey operations of the Lower Provinces for season 1863-64, No. 13, dated 18th January 1865.

23. Owing to the resignation of Mr. A. D. Smart, in charge 2nd or Upper Assam Waste Lands Survey, Mr. C. Brownfield, 1st Class Sub-Assistant attached to this Party, was, as a temporary measure, deputed to Assam,* at the commencement of the field season, and this survey was deprived of the services of a valuable and energetic Assistant.

24. The survey of the district of Noacolly having been completed, this Party has, under the orders of the Government of Bengal, (*vide* correspondence marginally cited,) been transferred to Assam, and will, during the ensuing season, begin operations in the district of Kamroop, where the Surveyor has reported a full season's work having been prepared in advance by the Superintendent of the Civil Branch of the Survey.

CHANGE OF FIELD OF SURVEY.

Letter No. 58, dated 4th July 1865, from Deputy Surveyor General, to Secretary Government Bengal.

Letter No. 3156, dated 30th August 1865, from Secretary Government Bengal, to Deputy Surveyor General.

2ND OR SOUTHERN DIVISION.

LOWER PROVINCES.

Captain D. Macdonald, Revenue Surveyor.

Assistants.

Lieutenant R. C. Beavan, Probationary Assistant Revenue Surveyor.

Mr. W. Ivey, Assistant Revenue Surveyor, 1st Class, transferred to 3rd Division, Oudh, on the 15th July 1865.

W. Sinclair, Assistant Revenue Surveyor, 3rd Class.

E. J. Jackson, Senior Sub-Assistant Revenue Surveyor, appointed 8th September 1864. *Vide* G. O. B. G. No. 6068, dated 29th November 1864.

G. Nash, Sub-Assistant Revenue Surveyor, 2nd Class, on sick leave, from 20th September 1864 to date of his death, viz., 25th March 1865.

W. A. Wilson, Sub-Assistant, 2nd Class, transferred from 3rd Division, Oudh, on the 4th July 1865.

Sergeant H. Wray, Sub-Assistant Revenue Surveyor, 3rd Class, transferred from 3rd Division, Lower Provinces, on the 4th July 1865.

30 Native Surveyors.

25. During the first week of December, the earliest safe time to enter the jungly tracts of the South-West Frontier Agency, this Party commenced field work in the district of Maunbhoom, in continuation of last season's operations.

26. The extreme south-east portion of the district adjoining Midnapoor on the south and Bancoornh on the east, was selected for survey.

POSITION AND AREA.

		Square Acres.	Square Miles.
Surveyed Mouzawar.	1. Ambeckanugger ..	358862 60	560 72
	2. Soopoor ..		
	3. Rnipoor ..		
	4. Simlapal ..		
	5. Bhechuidecha ..		
Surveyed topographically.	6. Maumbhoom ..	291212 69	455 02
	7. Phoolkoema ..		
	8. Shamsunderpoor ..		
	Total	650075 29	1015 74

This tract comprises the eight Pergunnahs marginally named. Of these the five first were surveyed Mouzawar, and the last three topographically, all on the uniform scale of 4 inches to

the mile. The total area of survey completed amounts to 650075.3 square acres, or 1015.75 square miles, held by 2,688 villages.

COST AND RATES.

	Rs.	A.	P.
Permanent Establishment	41,700	7	7
Contingencies	7,654	0	6
	49,354	8	1
Mehulwary charges	352	0	0
Total Rs. ..	49,706	8	1

27. The cost of survey amounts to Rs. 49,354-8-1, *vide* margin, giving an average rate for survey per square mile of Rs. 48-9-5, and per village of Rs. 18-5-9.

28. Several principal and secondary Stations, of the South Parasnath and South Maluncha series, Great Trigonometrical Survey, situated within the tract surveyed, were identified and carefully connected with those of the Revenue Survey. By a comparison of the results, the errors of the Revenue Survey measurements are within the allowed maximum, the average rate per mile of error being $\pm \frac{2 \cdot 16}{4 \cdot 76}$ feet.

29. As a check on the interior or detail operations, independent measurements were made at intervals by lines running across the Main Circuits. The Surveyor further reports that, owing to the indifferent manner in which the Thakbust maps had been constructed,

INTERIOR SURVEY DETAILS CHECKED.

he had to adopt the same means to check his survey of the boundaries of villages. The result of these check measurements on comparison with the interior and boundary work is reported to be very satisfactory. I have inspected and compared many of the demarcation maps furnished to this Party during the past and previous seasons, and have found them very inferior to any maps of the same kind I have yet seen in Bengal. In many instances there was little or no resemblance between the boundaries as obtained by the two modes of survey, Thakbust and Professional. The cause of inferiority in these maps is clearly to be traced to the absence of the use of Surveying Compasses in the field by the Survey Ameens, who trusted to the eye to enter the relative positions of the various bends or sinuosities of boundary on the maps.

30. The maps and records for the season have all been lodged in this Office, and duplicate copies prepared for the Civil Authorities, which will be delivered to them by the Surveyor on his way through the

SEASON'S RECORDS.

district. There is a very marked improvement in the drawing and finish of the Main Circuit or Pergunnah Maps, scale 1 mile equal to 1 inch, of this season, in comparison with those of previous years. The Village Maps are also clearer and more readable. All are complete, excepting in one instance, where, owing to some discrepancies discovered in the former and present survey of the common boundary of Midnapoor and Maumbhoom, redemarcation and resurvey must be made ere the limits can be laid down with certainty.

31. I inspected this survey during the recess, and was well pleased with the manner in which all the Office duties had been conducted, and with the good order that prevailed in all the Office arrangements.

INSPECTION OF OFFICE.

32. The south-east portion of this district now surveyed is described to be wild and

NATURE OF COUNTRY.

uninteresting in appearance; the soil poor, and the produce confined chiefly to rice. It is traversed from north-west to south-east by the Seleye and Cossye Rivers and their tributaries. Some portions are covered with dense bush and tree jungle; the ground is undulating, with isolated hillocks here and there, but on the western limits of the Pergunnah of Shamsunderpoor a small group of low hills occur. In the Appendix will be found an extract from the Surveyor's Annual Professional Report, giving further details respecting the country.

33. In the review on the operations of this Party for the last season (1863-64), it was

HEALTH OF THE PARTY.

mentioned that both the European and Native Establishments had suffered greatly from exposure to the unhealthy climate of the Maunbhoom District, and that Mr. Hyde of this Survey had died from the effects of fever contracted in the district. This season I regret to have to report another casualty: Mr. G. E. Nash, after months of suffering, was compelled to seek change of climate, and proceeded to Darjeeling on medical leave, where he died on the 25th March 1865.

* Leave, on Medical Certificate, from 8th May to 5th November 1865. *Vide* B. G. O. No. 2124, dated 1st June, and No. 2867, dated 4th August 1865.

34. Lieutenant Beavan, Probationary Assistant Surveyor, was crippled from illness almost immediately after the field season's work commenced, and on return to recess was compelled to proceed to sea.*

35. Mr. Ivey, who suffered in health throughout the field season (also obtained medical leave to Mussourie from the 14th June) was transferred to the 3rd Division Oudh Survey, and on the breaking up of that Party, was deputed to assist the Surveyor General in looking after and repairing Great Trigonometrical Stations in accordance with the orders of the Government of India, Home Department, No. 957, dated 12th August 1865, to the address of the Superintendent Great Trigonometrical Survey of India. On the completion of this duty he will join the 5th Division Bengal Surveys, to which he now stands posted. Mr. Sinclair, whose health was also considerably impaired, was obliged to seek change to Darjeeling for three months.

36. In November 1864,† Mr. E. J. Jackson was appointed to this Party as Senior Sub-

PARTY STRENGTHENED.

Assistant; he joined the Surveyor's camp at Rancegunge early in December, and did good service during the field season. Owing to the absence on leave of so many of the Assistants, it was further necessary to strengthen the Party for the recess work. Mr. Wilson was in consequence transferred to this survey from the 3rd Division Oudh; he joined on the 4th July 1865. Sergeant Wray was also transferred from the 6th or Hazareebaugh Division, Lower Provinces, and Sergeant Hill was attached temporarily to this Party to aid in recess computations and mapping.

37. For the current season of 1865-66, there remains for survey about 1,200 square miles,

**FUTURE OPERATIONS IN
1865-66.**

Koelupal, Matha, Hista, Torung,
Bughmondee, Patkoom, Cossyepara,
Barabhoom.

included in eight Pergunnahs marginally named. Of these the two first, *viz.*, Koelapal and Matha, are to be surveyed Mouzawar, and the remaining six topographically. A small portion of the Patkoom estate is situated on the west bank of the Subunreeka, and has been surveyed by the Topographical Party No. 4, Chota Nagpooor Division Survey, on the scale of 1 mile = 1 inch. This will be resurveyed by the 2nd Division on the same scale as the remainder of the district, in view to obtaining uniformity in the plans and records, and an accurate boundary survey of the whole estate.

38. The Surveyor reports that, for the ensuing field season, most of the necessary documents have been received from the demarcating Officer, and as the Party has been again brought up to full strength, the survey of this district may be expected to be completed by

April next (1866). The greater part of the area for survey is to be topographically surveyed. This portion has several principal and secondary Stations of the Great Trigonometrical Survey triangulation interspersed over it, which will materially facilitate the Revenue Survey work. The operations of the Topographical Party No. 4, Chota Nagpoor Division, also furnish good points of junction along the common boundary of Districts Lohardugga and Maunbhoom; and Chyebasa, or Singbhoom and Maunbhoom, which will not be neglected.

39. The completion of the Maunbhoom District, as above contemplated, will leave this Division free to enter on the survey of such district of Bengal as may be allotted to it. On this subject, therefore, early orders are solicited, that no delay may occur in moving the Establishment to, and arranging for, the new field of operations wherever it may be.

3RD OR EASTERN DIVISION.

LOWER PROVINCES.

40. In December 1864 survey operations were again resumed in District Sylhet, and extending

N. T. Davey, Esq., Revenue Surveyor.
Assistants.
 Mr. G. S. Swiney, Assistant Revenue Surveyor, 1st Class.
 " R. Barclay, Sub-Assistant Revenue Surveyor, ditto.
 " S. M. Smylie, ditto ditto, 2nd ditto.
 " T. D. Moran, Jr. ditto ditto, ditto.
 " D. A. King, ditto ditto, appointed 1st July 1864.
 " G. C. Bolst, Office Assistant.
 " J. Arntoon, ditto.
 " 29 Native Surveyors, &c.

eastwards of the previous season's work over the remaining portion of the Sylhet District were carried forward into District Cachar, the survey of which was commenced from its western boundary, counterminous with that of District Sylhet.

		AREA.			
		Acres.			Square Miles.
District Sylhet	.. ..	4,98,101	.. ..	778	
Ditto Cachar	.. ..	1,55,213	.. ..	243	
Total		6,53,314		1,021	

The total area surveyed in both districts amounts to 6,53,314 acres = 1,021 square miles, as per margin.

41. The unhealthiness of the country, especially during the early part of cold season; the impossibility of getting help in Cachar from planters or villagers until the crops had been gathered in January; and the setting in of the rainy season in the early part of May, reduced the field season to a minimum, and obliged the Surveyor to retire from the field, leaving about 150 villages of District Sylhet to be completed this season.

42. A series of triangles starting from the Great Trigonometrical Survey side, Dali

CONNECTION OF TRIANGULATION WITH 5TH DIVISION, LOWER PROVINCES, REVENUE SURVEY.

to Kulera, was extended across the valley lying between the Pathoria and Jampoil Hills and the Cachar boundary, down to the Northern Frontier of Hill Tipperah, where a junction was effected with last year's survey of the Tipperah Hills by the 5th Division, under Mr. O'Donel, Revenue Surveyor.

43. The connection was most satisfactory, the difference in measurement of the distance between the two Stations* closed upon, being only four inches.

* Adin Tilah, Teoloongta.

By 5th Division	...	...	...	76309.20 feet.
By 3rd ditto	...	...	...	76308.37 ,,
Difference				0.33 ,,
Or				3.96 inches.

DEMARCATON MAPS.

44. The comparison of professionally surveyed boundaries with those of the Civil Branch was also very satisfactory, few discrepancies being found.

45. The survey of the boundary between District Sylhet and Hill Tipperah was resumed from Hararguj, Great Trigonometrical Survey Station, where it was brought to a close in 1863-64, and was carefully laid down for twenty miles further, as far as the source of the Thall Nullah; thence to Chatterchoora Hill, the jungle was impenetrable, and detail measurements being impossible, except at ruinous expense, hill points were chosen along the line of common boundary, and fixed by a minor triangulation carried on in connection with the series above mentioned. From the extracts appended of the Revenue Surveyor's Annual Report, it will be seen that a correction was made in the boundary laid down in 1863-64 between Sylhet and the Tipperah Hills, by which 9,872 acres were added to the area of the Sylhet District, a stream having been discovered in the course of survey, which proved to be the Dingai Churra of Fisher's map, the existence of which had been doubted by the agents of the Tipperah Rajah.

EXECUTIVE OFFICER.
has resurveyed and relaid down this difficult boundary.

46. Great credit is due to Mr. Davey for the able manner in which, in co-operation with the Settlement Officer, he has resurveyed and relaid down this difficult boundary.

47. In para. 58 of Annual Report for 1863-64, the Surveyor General drew attention to the absolute necessity of pillars being built during the present cold season along the whole line of Frontier boundary. This work has now been commenced upon by the Public Works Department, and will, it is hoped, be completed before the rainy season again sets in, and while the cleared lines and temporary wooden Station marks are easily traceable in the jungle.

48. The cost of the season's work, including all contingencies, amounts to Rs. 50,823-9-5,*

		COST AND RATES.	
* Permanent..	...	Rs.	35,912 13 2
Contingencies	...	"	14,910 12 3
			<hr/>
			50,823 9 5
Mchalarwy charges	...	"	595 1 0
			<hr/>
		Total Rs.	51,328 10 5
			<hr/>
		1863-64.	1864-65.
† Jungle clearing	...	Rs.	934 2,120
Hill Batta	...	"	340 3,230
Elephants	...	"	1,122 4,609
			<hr/>
		Total Rs.	2,396 9,959
			<hr/>
		Difference	+ 7,563
			<hr/>

showing an average rate of Rs. 49-12-7 per square mile; the rate per village circuit cannot be given, as it does not apply to several portions of the work. The excess in the items of contingent expenses of the year under review, when contrasted with those of 1863-64, will be seen from the comparison as per margin; † this has arisen from the difficult nature of the country, the expense of living, the scarcity of labour in Cachar, and the enhanced rates at which alone it is procurable.

49. The linear measurements of the Revenue Survey in District Sylhet have been rigidly tested by the Eastern Frontier Series of the Great Trigonometrical Survey of India which passes over the whole length of the district. A general comparison of results gives the following mean average of error of Revenue survey:—

Revenue Survey measurements in excess	...	+	2.86	} feet per mile.
"	"	in defect	...		— 2.43

These testify to the careful and correct manner in which the survey operations have been carried on by Mr. Davey and his Assistants, of whom he thus speaks in his Annual Report:—
“For this result credit is due to my Assistants for their measurements of Main Circuits, and their sustained efforts to ensure the best results in spite of opposing circumstances. The greater part of District Sylhet might be described, without much exaggeration, to be either hills, and jungle; lands, or, swamps; and the difficulty of carrying detailed measurements through such a country need not be dwelt on.”

50. The maps and records have all been duly brought up, and, with the exception of one general map, including that portion of Sylhet already alluded to as unfinished, have been lodged in this Office.

MAPS AND RECORDS.

A decided improvement in the preparation of these records over those of previous years is noticeable. They are very well got up.

51. During the present season the 150 villages remaining for survey in District Sylhet will be completed, whilst in District Cachar, the Surveyor proposes first to take up the portion north of the Barah River, bounded as follows :—

WORK FOR SEASON 1865-66.

- North, Northern Cachar.
- South, Barah River.
- East, Muneepoor.
- West, Jatinga River.

After this the Parties will enter on the tract of country adjoining Pergunnah Hylakandy, including Chatla Howkar, and extend their operations, if possible, as far east as the first range of hills.

52. The area estimated by the Revenue Surveyor, as remaining for survey in District Cachar, is as follows :—

						Sq. Miles.
Of demarcated lands	} Villages	... ..	... ..	... ..	... ..	250
		... ..	Grants	..	... ..	860
						<hr style="width: 100%;"/>
		Waste land	... ..	... ..	... ..	3,000
						<hr style="width: 100%;"/>
Total						... 4,110
						<hr style="width: 100%;"/>

53. The Surveyor notices the great want of permanent marks on the boundaries of grants and Tea garden estates in Cachar. This question, however, has already been referred to the Government for orders, and needs therefore no further mention.

BOUNDARY PILLARS FOR MARK-
ING GRANTS IN DISTRICT CA-
CHAR.

54. The several Assistants are all well spoken of. Special mention is made of the services of Mr. Barclay, Senior Sub-Assistant Revenue Surveyor, in connection with the arduous duties involved in relaying the Tipperah Frontier boundary.

OPINION OF ASSISTANTS.

4TH OR WESTERN DIVISION.

LOWER PROVINCES.

55. As explained in the last printed Report for season 1863-64 of the operations of the Revenue Survey in the Lower

- Lieutenant W. J. Stewart, Revenue Surveyor.
- Lieutenant E. W. Samuells, Assistant Revenue Surveyor, confirmed 5th June 1865.
- Mr. J. K. Moran, Assistant Revenue Surveyor, 3rd Class, resigned 1st June 1865.
- Baboo Lalla Ram, Sub-Assistant Revenue Surveyor, 2nd Class.
- Mr. C. David, Sub-Assistant Revenue Surveyor, ditto.
- " H. R. Littlewood, ditto ditto ditto, ditto.
- " F. W. Nicholson, ditto ditto ditto, 3rd Class.
- " J. N. Stoelke, Jr. Sub-Assistant Revenue Surveyor.
- 36 Native Surveyors, &c.

Provinces, page 20, para. 85, the resurvey of the villages on the banks of the Gunduck and Ganges Rivers occupied this Party for the season under review.

56. About the middle of November the Field Parties started work on both banks of the Gunduck River, near the town of Hajeepeer, and working north-westwards up the course of the river proceeded and

closed work on the boundary between Pergunnahs Tilpoor and Sidhoa Jobena on the Goruckpoor side, and Rajpoor, Sohurra, and Chigwun Butsurra on the Chumparun side, beyond which no village boundary demarcation had been effected. The resurvey of the Dearehs and villages along the Ganges, from the confluence of the Gunduck eastward, as far as Pergunnah Gyaspoor of Patna and to a point opposite on the Tirhoot side, was also completed, the total length surveyed being 160 miles, with an average breadth of eight miles.

57. The aggregate area brought under survey amounts to 1202.1 square miles, or 769324.8 acres, all of which, the Surveyor reports, was surveyed with the most scrupulous care. The Cantonments of

Dinapoor and Civil Station of Bankipoor have also been surveyed and mapped, and a survey of the City of Patna is in progress.

58. A good junction was effected with several Stations of the Great Trigonometrical Survey, and a comparison of the linear distances obtained from

REVENUE SURVEY CHECKED
BY GREAT TRIGONOMETRICAL
SURVEY DISTANCES.

these independent operations proves that the Revenue Survey chained distances are trustworthy, and have been made with due care. The differences are

+ 4.3	}	feet per mile.
— 4.5		

59. The expenses incurred for Establishment and contingencies amounts to Rs. 48,207,*

COST OF SURVEY.

* Permanent charges	Rs.	41,412	
Contingent "	"	6,795	
	Total Rs.	48,207	
Mehalwary charges	"	630	

the cost of Mehalwary calculations, or non-professional charge, being Rs. 630. Excluding the last item, the average cost per square mile is Rs. 40-1-8, and per village circuit Rs. 38-3-2. These figures show a considerable decrease on the average, but exceptional, rates of the preceding season, which, however,

were explained in para. 69 of the last printed Report.

60. The labors of the Revenue Surveyor and his Assistants have been greatly increased both in the field and recess, by having to institute accurate

ADDITIONAL LABOR INVOLVED.

comparisons between the old and new survey; and where differences were found in boundaries of lands not likely to have been affected by the action of rivers, in reconciling the two measurements. All the field marks of the old survey having been obliterated years ago, the difficulties which the Surveyors experienced in assimilating discrepant boundaries were necessarily greatly increased, and the cost of the survey proportionately augmented.

61. Again, in lands subject to annual inundation, it became necessary not only to compare the old and new plans, but to mark off the old lines of boundary on the new plans, and to calculate the excess or defect of the resurveyed area, to ascertain the areas of alluvion and diluvion. These data have been entered in the Statistical Returns, whilst the Village Plans show the old boundaries in red, so that District Officers can at once ascertain the precise nature and extent of the changes which have taken place since the first survey. Still further, to facilitate the settlement operations, the Surveyor has been directed to furnish Collectors of districts under survey with copies of the boundaries of villages and Dearehs immediately after the Field Plans have been received in Office and verified. This he has done and is now doing.

62. The Surveyor reports that in Pergunnah Hajeepoor Deareh, and the portion of the Patna District embraced within the operations of the season under review, the outer or basis line of the survey has been marked by permanent masonry pillars. It is hoped that the entire line on both banks of the various rivers will be similarly marked during the present season; without such points the utility of the present resurvey for future reference will be seriously impaired, and the difficulties now felt in assimilating the old and new survey will again arise,—but in a still more complicated form,—when the fluctuations of these ever-changing rivers shall again render a resurvey of the villages on their banks indispensable.

63. During the present season the work will progress along the Ganges, through the remaining portion of the Patna and Tirhoot Districts, into those of Purneah, Monghyr, and Bhaugulpoor. Some extra work, in addition to the river survey, has also been allotted to this Party, in relaying certain portions of the boundary of Damini-Koh, or Rajmehal Hills, regarding which disputes had arisen.

64. A resurvey of the River Koosey in Purneah, which has shifted its course some miles the westward, has also been proposed, but must be deferred for the present.

65. The maps and records of the season have all been completed, but have been ordered to be retained, by the Revenue Surveyor for the present, pending the entry of certain extra data lately called for. I have inspected the larger portion of them however, and am well pleased with the care and method displayed in their execution. The Cantonment Plans are specially worthy of notice.

66. The Revenue Surveyor reports well of all his Establishment, European and Native, both in field and Office.

5TH OR BENGAL DOOAR DIVISION.

LOWER PROVINCES.

67. In the Surveyor General's last printed Annual Report for season 1863-64 on the Revenue Survey operations of the Lower Provinces, paras. 95 and 98, all particulars were given of the transfer of this Party from the survey of the hilly portions of Chittagong and Tipperah to the newly annexed Bengal Dooars, under instructions from the Government of Bengal letter No. 3930, dated 22nd November 1864; a small detached Party of two Assistants* with a few Native Surveyors being left to complete the survey of some small tracts of hilly land, situated within the plain portion of the district of Chittagong, which had not been attempted by the Survey Establishment under Lieutenant Siddons in 1835-41.

- J. H. O'Donel, Esq., Revenue Surveyor.
- Assistants.*
- Mr. J. Pickard, Assistant Revenue Surveyor, 1st Class.
- " W. Vyal, Sub-Assistant ditto, transferred to 6th Division, Lower Provinces, on the 15th November 1864.
- " G. V. Thompson, Sub-Assistant Revenue Surveyor, 2nd Class, permitted to resign, as per B. G. O. No. 6176, dated 27th October 1865.
- " R. Savage, Sub-Assistant Revenue Surveyor, resigned 16th August 1865.
- " J. H. O'Donel, Jr., Junior Sub-Assistant Revenue Surveyor.
- " E. C. Mason, Junior Sub-Assistant Revenue Surveyor, appointed 23rd November 1864. *Vide* B. G. O. No. 358, dated 12th January 1865, resigned 3rd June 1865.
- " G. H. O'Donel, Junior Sub-Assistant Revenue Surveyor, appointed 1st September 1865. *Vide* B. G. O. No. 3267, dated 8th September 1865.
- 23 Native Surveyors, &c.

- * Mr. J. Pickard.
- " G. V. Thompson.
- 10 Native Surveyors.

68. Pending the final instructions of the Bengal Government for the transfer of the Party, Mr. O'Donel was directed, early in November 1864, to place himself in communication with the Commissioner of Chittagong and initiate the survey of the waste lands above referred to. All preliminaries having been satisfactorily arranged with the Civil Authorities, the whole of the Field Parties set to work early in December, and were actively employed in Chittagong until the last week of the month, when the orders above referred to, to leave for the Bengal Dooars, having been received, complete instructions were left with Mr. Pickard, the Senior Assistant with the Party, for the future conduct of these operations, and the Surveyor and the main portion of the Establishment then commenced their march for the Bengal Dooars, which they reached on the 8th March, making Minagooroe the Field Head Quarters.

69. No sooner did it become known to the Native Establishment that the Party was really starting for the Dooars, than a large number (sixty-eight) deserted without giving any notice of their intentions.

DESERTION OF A PORTION OF THE NATIVE ESTABLISHMENT.

70. On the 18th March field work commenced in the Dooars. The nature of FIELD OPERATIONS IN THE the operations, owing to the want of boundary demar- DOOARS. cations (the country having been only about six weeks in possession of the Civil Authorities at this time,) was, by orders of the Government of Bengal,* purely topogra- phical. The scale of the survey under the same orders was fixed at 2 inches to the mile.

71. The portion of country selected for immediate survey was that lying between the Teesta and Toorsa Rivers, and extending from the northern boundary of Cooch Behar upwards to the hills, embracing, as far as is yet known, the following Dooars or Sub-Divisions, shown on the map of Bhootan lately published by this Office, *viz.*, Zamerkote, Toondoo, Chamurchi, Chukla Minagooree, Doomchi, Balla, and Madar, in which are situated several Police Stations and out-posts, and through which roads have been opened from the frontier districts of Bengal to communicate with Dalingkote, Chamurchi, Balla, and Buxa Forts.

72. The Great Trigonometrical Station of Dhurrumpoor, about 8 miles south of the new Civil Station of Minagooree, was adopted, as favorably situated ORIGIN OF SURVEY. for the origin, for the survey of these Western Dooars. Starting thus from the extreme south-west, survey operations extended along the left bank of the Teesta, (across which a good junction was formed, by means of old tri-junction pillars, with the former Revenue survey of District Rungpoor,) eastwards along the Cooch Behar Frontier to the Toorsa River, and north and north-east as far it was possible to penetrate the jungle that season. The extreme limits to the north may be described by a line starting from a point on the Teesta River due west of Kyrantee Haut, and passing through Kyrantee, eastwards, to Latagooree Police Station; thence south-east to a point on the Joldhoka River, about two miles above the Haut of Amgooree; on again north and north-easterly along the Joldhoka and Dinah Rivers to Ambaree; then south-east to the village of Gorabunder, and thence along the made road, east and north-east, to Balla camp on the Toorsa.

73. The duration of the field season, namely, from 18th March to the first week of May, DURATION OF FIELD SEASON or about one and a half months in all, was extremely short; AND DIFFICULTIES ARISING FROM added to which before the working Parties had been a NATURE OF THE COUNTRY. month in the field, fever and dysentery prostrated alike the European Assistants, Native Surveyors, and Lascars, and, in the beginning of May, only one interior Party could with difficulty be recruited to full strength to proceed with work. Water, in many places, was only procurable at great distances, while provisions within nine-tenths of the country under survey, could not be procured at all. It was therefore necessary to form supply depôts within easy reach of the several detached Parties, from the commencement. The scanty population in these tracts rendered it also most difficult to procure labor for line cutting through the jungles. From this it will be seen that the difficulties against which the Surveyor had to contend were of no ordinary character, and these, combined with a very short working season, must be considered, when comparing the out-turn of work of this survey with that of others.

74. For the above reasons, out of the area (515 square miles,) embraced in the circuit AREA COMPLETED. above described, only 175 square miles of complete interior detail or final survey, could be accomplished. The remainder was only outline or route work, which, however, afforded much valuable geographical information. At the request of the Chief Political Officer the Station of Minagooree was surveyed and mapped with all details on a scale of 4 inches=1 mile, and route surveys were made from Minagooree, *vid* Patla Kova, to Cooch Behar, and from Julpigooree to Cooch Behar. A route survey was also made to Balla; and the Toorsa River surveyed from Balla to the point at which it enters Cooch Behar.

NOTES DESCRIPTIVE OF THE
NATURE OF THE COUNTRY.

75. Some valuable information relating to the natural features of the Western Dooars, extracted from the Surveyor's Annual Report, will be found in the Appendix.

DETACHED PARTY EMPLOYED
IN CHITTAGONG.

76. In connection with the labors of the Western Bengal Dooars Survey, I pass on to review the working of the small Party detached from this Establishment for the waste land survey in Chittagong, *vide* para. 66.

77. The tract especially allotted for survey to this Detachment consisted of three low ranges of hills running parallel with the Chittagong coast line, the first or the northernmost being between the Rivers Kurnafulee and Fenny, the second between the Sungoo and Moree Rivers, and the third on the promontory of Tek Naaf. These slightly elevated and jungle covered tracts, which apparently were hitherto considered of no value by the Natives of the country, except as affording slight pasturage for cattle, were found within late years to be well suited for the cultivation and growth of tea; most of them were consequently either at once taken up in lots, or applied for by intending planters. It was therefore of importance, to define the boundaries of such lots as had been sold, and ascertain their areas; and also to define the boundaries at the foot of these hills in accordance with the survey of 1835-41, in order to determine how far, since then, cultivation had been extended by the cultivators of the plains into these hilly tracts, and to fix permanently some line between the holdings or grants in the hills and the lands of the cultivators in the plains.

78. The total area requiring survey is estimated at 320 square miles; of this, during the season under review, only 172.31 square miles, or 110283.8 acres, have been completed, leaving about 148 square miles for survey during the current season.

AREA REQUIRING SURVEY,
AND AREA COMPLETED.

79. Owing to the difficult nature of the ground for detail measurements, and the impossibility, in most places, of traversing across these low jungle clad hills, a net-work of triangulation was extended over them; and from the Stations of this triangulation, as points of reference, traverse lines were run along the boundaries of 42 lots or grants; having thus obtained actual bearings and chain measurements along these boundaries, whether they run along the water-shed of hills, in streams, or along low lands, it will at any time be possible to relay them, as they now exist, from the field books in which entries of all boundary offsets have been ordered to be carefully inserted.

SCALE OF SURVEY AND POINTS
OF REFERENCE.

80. The boundaries skirting the foot of the hills, as well as those across, and dividing grants or lots, with all necessary details, have been mapped on 2 inches = 1 mile, and the interior or details in the hills on 4 inches to the mile. Twenty-three conspicuous objects, such as Pucka houses, &c., and three Great Trigonometrical Survey Stations, *viz.*, Seetakoond, Nagarkhana, and Jangalia, have been fixed and connected with these operations as points for future reference and comparison.

TOTAL AREA.

	Sq. Miles.
* In Chittagong ...	172.31
In Bhootan Dooars ..	175.00
Total square miles ..	347.31

81. The total area accomplished by this Party in the Bhootan Dooars and district of Chittagong* amounts to 347.31 square miles of detail or final survey, and about 340 square miles of skeleton or outline traversing in the Dooars, chiefly over jungle covered land. The total cost of these operations amounts to Rs. 40,505-6-8.

82. The survey having worked under unusual and exceptional circumstances in the

COST OF SURVEY.

Dooars, and not having as yet completed the entire details, it is impossible to fairly estimate the average cost on the square mile for this portion of the work. In the Chittagong District 42 grants, giving an area of 110283·8 square acres, or 172·3 square miles, were completed at a cost of Rs. 21,511-14-7, yielding an average on the square mile of Rs. 124-13-6, or per square acre, of annas 3-1.

83. The Surveyor reports the completion of the annual maps and records of both the

MAPS AND RECORDS.

Dooars and Chittagong Surveys; the former, however, being incomplete cannot be lodged this season. Of the Chittagong waste lands the records are daily expected.

84. During the current season of 1865-66, owing to the Political Agent and Chief

DEMARICATION IN BHOOTAN DOOARS.

* Letter No. 408, dated 16th July 1865, from Secretary Government of Bengal, to Political Agent and Chief Civil Officer in the Western Dooars, with his professional operations,

† Letter No. 3099, dated 24th October 1865, from Secretary to Government, Home Department, to Secretary Government of Bengal.

Civil Officer in the Dooars being unable to provide a Civil Officer and Establishment for the demarcation and settlement duties, and on a representation personally made by the Surveyor, the Government of Bengal decided *that the Surveyor might conduct these duties in connection and the sanction of the Supreme Government was accordingly obtained† to a grant of Rs. 9,863 for the first year, and of Rs. 7,350 annually, until further orders, for the Native Establishment necessary to aid the Surveyor in these new duties. It is believed that the difficulties of demarcation in these Dooars will be little or none, and no disputes are anticipated. Under these circumstances, the Surveyor will probably succeed as well with the double duty in the Dooars, as he did formerly in Arracan in seasons 1858-59 to 1860-61. But where boundaries are intricate, the country is much cultivated, the value of land is great, and disputes of boundary are the rule, not the exception, separate superintendence will always have to be provided for demarcation purposes.

RESIGNATION OF SUB-ASSISTANTS.

Mr. G. V. Thompson, Sub-Assistant, 2nd Class, resigned 27th December 1865.
 „ R. Savage, ditto, ditto, ditto 16th August 1865.
 „ E. C. Mason, Jr. Sub-Assistant, resigned 3rd June 1865.

85. The Sub-Assistants marginally named resigned their appointments from the dates specified opposite their names, owing to the unhealthiness of the climate.

86. This season, 1865-66, the operations of the Bengal Dooars' Survey Party will extend, in continuation of last season's survey, northwards

FUTURE OPERATIONS.

to the foot of the hills through the following Dooars and Chuklas, viz., Minagooree, Domohanee, Gopalgunge, Bhotehnut, Chengmaree, Kyrantee, Jhar, Toondo, Moraghaut, Madaree, and part of Balla Dooar. In open and cultivated tracts a regular Mouzawar survey will be made and village boundaries be demarcated and mapped, but in the Terai and forest lands the boundaries of Chuklas and Dooars only have to be represented.

87. The detached Party in Chittagong will complete the small remaining portion of the waste lands and grants survey in the low hills on the Tek Naaf promontory, and will then rejoin the Head Quarters at Rungpoor. This will enable Mr. O'Donel to take the field in 1866-67, and continue the survey of the Dooars with the full strength of his Party.

6TH OR HAZAREEBAUGH DIVISION.

LOWER PROVINCES.

88. This Party was employed, during the season under review, in Pergunnah Palamow, of the district of Lohardugga, and in the resurvey of the topographical features of two main circuits in Pergunnah Khurruck-decha in the district of Hazareebaugh.

Major G. H. Thompson, Revenue Surveyor.

Assistants.
 Major W. S. Rowe, Assistant Revenue Surveyor.
 Mr. J. Todd, Sub-Assistant Revenue Surveyor, 1st Class.
 " W. Vyall, ditto, ditto.
 " H. Billon, ditto, 2nd Class.
 " P. H. W. Brady, ditto, ditto.
 " R. Scott, ditto, 3rd Class.
 Sergeant Hill, ditto, ditto.
 " Wray, Sub-Assistant Revenue Surveyor, 3rd Class, transferred to 2nd Division, Lower Provinces, 4th July 1865.

89. The operations in Pergunnah Palamow embraced 729-73 square miles of Mouzawar Survey, and was bounded to the north by the previous season's work of this Party, to the east by the Hazareebaugh District, and north and west by the unsurveyed part of the Palamow Pergunnah.

90. One thousand three hundred and eighty-four square miles were also triangulated and prepared in advance in Palamow, to furnish available data for the continuation of the detailed Mouzawar Survey, which is now being carried on. The necessity of the triangulation being in advance of the detail survey has been noticed in previous Reports.

91. The area of the portion of Hazareebaugh resurveyed was 924-53 square miles.

COST AND RATES.			92. The total expense incurred during the season amounts to Rs. 65,469-5-11;* of this sum Rs. 15,000 have been assigned as the cost of the resurvey. Adopting these figures, the following mileage rates are obtainable:—
	Rs.	A. P.	
* Permanent ..	54,321	14 7	
Contingencies ...	11,147	7 4	
Total ...	65,469	5 11	

			Rs.	A. P.
On the Palamow Mouzawar Work	...	...	69	2 6
On the revised Khurruckdecha Survey	...	...	16	3 7

93. The Surveyor has, during the past season, carried on a regular system of minor triangulation throughout the work. By these means alone are rigid results obtainable. As the triangulation emanated from the Great Trigonometrical Survey Stations, Paraya and Sindrouli, data for testing the accuracy of the linear work is available. This will be carried out as soon as all the records have been received.

94. The out-turn is a very fair one. The country is difficult, and the Surveyor dwells upon the laborious duties it entailed, particularly in cutting the rays for triangulation; although the scene of his labors was in the most open and cultivated parts of the Palamow Pergunnah, viz., the valleys of the Amanut and Koel Rivers, the cultivated portions were yet comparatively of limited extent, the greater part of the season's out-turn being made up of hilly broken ground covered with jungle. The jungle tracts appear to be sparsely inhabited, but, wherever cultivation extends, the virgin soil gives rich and luxuriant crops.

95. The necessity of having parts of the previous survey operations of this Party re-done has been alluded to in para. 96 of the Annual Report for 1862-63, and again in para. 12 of that for 1863-64. The whole subject, however, having been laid before the Government of Bengal, it is needless to revert to it here.

96. The area in the Palamow Pergunnah remaining for survey is estimated at 1,900 square miles, of which about 1,100 square miles will be got over during the current season, leaving 800 for season 1866-67; more work must, therefore, be provided for this Party to keep it fully employed during the working season. If a resurvey of the portions of

PROBABLE TIME FOR COMPLETION OF DISTRICT.

Hazareebaugh District lying north of the Grand Trunk Road be determined upon, this Party, now well practised in the rough broken ground of that side of Bengal, may well be so employed.

97. The Surveyor writes in high terms of his Assistants and the Native Surveyors generally, and particularizes Mr. Todd as having given great satisfaction.

98. From the cursory examination had of the maps, &c., the work appears to have been more carefully done than formerly. In the absence, however, of the field sheets, &c., which have been called for, it is impossible to express a more decided opinion of the value of the work.

99. The hill drawing by Major Rowe, Assistant Revenue Surveyor, is well deserving of notice.

1ST OR DARJEELING REVENUE AND TOPOGRAPHICAL SURVEY.

100. With the object of completing the survey of the Morung Pergunnahs of Darjeeling District, this small Party was again divided into two Camps. The first, under the immediate supervision of the Officer in charge, being employed in the hills, and the second, under his Assistant, in the plains, or forest tract at the foot of the hills.

101. Operations in the hills commenced on the 1st November. The work was sometimes continuous, sometimes detached, according to the position of the lands or estates demarcated. The chief block completed runs along the western boundary of the Darjeeling District, from the foot of the hills to the junction of the Rumman River with the Great Runjeet on the north, embracing also the principal slopes eastward of Tongloo Mountain, between the Rumman and Little Runjeet Rivers, and portions of the Goom, Nagri, and Tharboo ridges. The detached blocks comprise the southern and western declivities of Sitong, a portion of the western slope of the main ridge extending from Jullapahar to Kursiong, bounded on the west by the new cart road, and parts of the south-east slopes of the Sebong and Tungboo spurs. The total area amounts to 94408.37 acres, or 147.51 square miles, divided into 41 estates and 48 locations.

102. In the plains, or Morung, work commenced towards the end of November; a small area remained for survey on the north of Hattigheesa Pergunnah, in addition to the entire Pergunnah of Patterghatta, extending from the Chenga Nuddee eastward to the Mahanuddy and Gulma Rivers on the Rungpore boundary, and amounting to 106742.04 acres, or 166.78 square miles, containing 178 jotes or clearances for cultivation, 48 blocks of Government lands, 1 market, 3 thannabs, 4 reserves, and 2 encamping grounds. This was successfully completed by the 10th May, although the Sub-Assistant and all his Native Establishment suffered severely from Terai or jungle fever.

		TOTAL AREA AND COST.			
		Square Miles.	Acres.		
* Hill portion	.. ..	147.5	94408.4		
Plains	.. ..	166.8	106742.0		
		<u>314.3</u>	<u>201150.4</u>		
		Total	..	314.3	=
				201150.4	=
† Permanent charges	...	...	Rs.	A.	P.
Contingencies	...	...	17,072	15	2
Coolie for clearing jungle paid by the Superintendent, Darjeeling	...	...	2,869	15	0
			3,645	12	3
		Total	...	23,588	10 5

103. The total area of final survey completed in both hills and plains amounts to 314 square miles, or 2,01,150 acres,* at an entire cost of Rs. 23,588-10-5, including Rs. 3,645-12-3 paid by the Superintendent of Darjeeling on account of Coolies for clearing jungle. The details are as shown in the margin.†

104. In the hills the operations of this Party extended over very rugged and elevated

DIFFICULTIES.

tracts, which added very considerably to the labors of the Establishment and the difficulties to be overcome. Some of these ranges are clad with virgin forest, in which probably a tree had never before been felled, and through which detail measurements, as may be imagined, could have been no easy task.

105. In the Morung, or plains, where, as already noticed, a portion of the Establishment suffered severely from sickness, the ground is low, marshy, and covered with forest and high grass jungle. Here, lines had to be cut at every step, and thus out of 30 Nepalese Coolies specially engaged for this work, nine Coolies and two Sirdars died of Terai fever; the remainder were panic-stricken and deserted. Extracts from the Surveyor's Annual Report, relating to the topography, local improvements, &c., will be found in the Appendix.

MORUNG PERGUNNAH SURVEYED.

Area	Pergunnah Patterghatta.		Pergunnah Hattigheesa.	
	Acres.	Square Miles.	Acres.	Square Miles.
• Area	103048	8=161'0	70616	5=110'3
Jotes	464		383	
Hauts	5		3	
Thannahs	5		0	
Jbars	5		6	
Encamping grounds	2		0	
Government Reserves	91		38	
Total Number of Blocks..	572		430	

106. The two Morung or Terai Pergunnahs at the foot of the Darjeeling hills having been now completely surveyed, the information marginally* given may prove valuable.

107. The Assistant Surveyor in charge reports that the annual records and maps are near completion. The Atlas Sheets on the large scale of 4 inches=1 mile have just been received, and are very creditable, as specimens of hill drawing, to the Officer in charge, who drew them almost entirely himself. Entry of relative and absolute heights only is required to improve them, and this information has been called for from the Revenue Surveyor.

ANNUAL RECORDS.

108. In addition to the work remaining to complete the Darjeeling waste lands, a Party

FUTURE OPERATIONS.

† Letter No. 3939, dated 22nd November 1864.

from this survey has been directed, under orders from the Government of Bengal,† to commence operations in the hills of the Western Dooars, lately annexed from Bootan, and the Assistant Surveyor has been directed to proceed into these hills at the commencement of the current field season, and prepare the ground by laying out a net-work of triangulation as a ground-work for the topographical detail sketching, which will follow. In co-operation with the Civil Authorities, this Party will also survey and map the new frontier boundary, which now touches on Sikkim, Tibet, and Bootan.

109. The attention of Government was drawn, in No. 26, dated 3rd January 1866, to

LAND MARKS.

the fact of many estates and grants in the Darjeeling hills, and in the Terai at the foot, having had no permanent land marks erected. The future practical utility of the present boundary survey mainly depends on these being erected in accordance with the provisions contained in para. 14 of Waste Land Rules, published under authority of the Government of Bengal, and orders have accordingly been issued to enforce the 2nd Clause of Rule 14.

2ND OR UPPER ASSAM REVENUE AND TOPOGRAPHICAL SURVEY.

110. Mr. C. Brownfield, Senior Sub-Assistant Revenue Surveyor, who was temporarily

C. Brownfield, Esq., Senior Sub-Assistant Revenue Surveyor, in charge.
14 Native Surveyors &c.

posted to the charge of this Party,‡ took charge on the 7th March 1865, and immediately

‡ *Vide* para. 141 of Annual Report, 1863-64.

concerted plans for taking the field in District Seesaugor.

111. The Civil Establishment of the Survey having only entered the district the previous month, little or no work could be prepared in advance for the Professional Parties; under these circumstances, the settlement operations and those of the Professional Party proceeded simultaneously.

112. The tract of country which came under survey extended from Jorehaut, in continuation of the previous season's work, to within a couple of miles of Golaghaut on the west, and lies between the Dhodur

LOCALITY.
Allee on the south, and Kamarbanda Allee on the north and north-west.

AREA. 113. The total area surveyed and mapped on the scale of 4 inches = 1 mile amounts to 92,652 acres = 145 square miles, comprised in

- 34 Grants.
- 19 Waste land blocks.
- 12 Villages, and portions of.
- 13 Others.

—
Total ... 78 Traverse Circuits.

Of this area 124 square miles form one compact block; the rest is detached work and not yet connected.

COST AND RATES.		
Permanent Establish- ment ...	Ra.	A. P.
...	10,703	11 0
Contingencies ...	3,306	10 2
Total ...	14,010	5 2

114. The cost of the season's operations, amounting to Rs. 14,010-5-2, including contingencies of all kinds, gives the average rates of Rs. 0-2-5 per acre.

115. The great obstacle to the rapid progress of the survey appears to be, as already noticed in former Report, the difficulty of getting boundaries cleared by Grantees; with this exception, however, the Sub-Assistant acknowledges having received every assistance in the prosecution of his work.

DELAYS IN PROGRESS OF WORK.

116. Few permanent land marks appear to have been erected by the Grantees and other proprietors of estates, but orders have been lately issued to enforce their erection, as in the case of Darjeeling.

BOUNDARY MARKS.

117. The maps and records have not been received as yet; their despatch, however, has been reported. The records of 1863-64 have, since the submission of the Surveyor General's Annual Report, been lodged in this Office.

MAPS AND RECORDS.

118. The north-eastern portion of the district having been partly demarcated, the operations of the current season will extend from the field of former survey eastwards to Mouzah Jyepoor, on the north-east boundary of the district. The survey will embrace 41 Mouzahs, giving an area of nearly 600 square miles.

WORK FOR SEASON 1865-66.

119. The Party has been completed to full strength, and a competent Assistant has been posted to it. A good season's out-turn is therefore anticipated.

120. Mr. H. B. Talbot, Assistant Revenue Surveyor, has recently been transferred from the Rohilund Survey to the 2nd or Upper Assam Revenue and Topographical Survey, and will, on his arrival in District Seebaugor, take charge of the Party from Mr. Brownfield, who will then rejoin his former Survey Party. Mr. Brownfield has performed the duty entrusted to him in Upper Assam to my entire satisfaction, and I have much pleasure in bringing him to the notice of His Honor the Lieutenant Governor.

CHANGE OF EXECUTIVE OFFICERS.

3RD OR LOWER ASSAM REVENUE AND TOPOGRAPHICAL SURVEY.

**J. O. Nicolson, Esq., Officiating Surveyor,
10 Native Surveyors, &c.**

AREA AND COST.			
Permanent ...	Rs. 14,794	1	8
Contingencies...	,, 1,016	12	9
Total Rs. ...	15,810	14	5

121. During the season 1864-65 Mr. Nicolson has completed the survey of 35 grants in District Kamroop, embracing an area of 27,474 acres = 43 square miles, at a cost of Rs. 15,810-14-5. This includes contingencies, and gives an average rate of Rs. 0-9-2 per acre.

122. Mr. Nicolson reports that his operations, during the season under review, were greatly delayed from the difficulty of procuring proper assistance in the clearances of the boundaries of grants, previous to survey, and to this, it appears, are the slow progress of the Native Surveyors and high rates to be mainly attributable.

SURVEYOR'S DUTIES IN CONNECTION WITH THE SETTLEMENT OF BOUNDARY DISPUTES.

123. In addition to the above, the Surveyor thus reports on his duties in connection with the settlement of boundary disputes—

“ There was a Demarcation Party in the district under a Native Deputy Collector, but the Commissioner did not wish this Party should have anything to do in adjusting boundaries in which Europeans were in any way interested, so I had to undertake the settlement of all boundary disputes connected with the waste lands grants. It took up most of my time both in the field and in quarters; the disputes, which were generally between Planters and the Villagers, being many, and could not be settled except by going to the spot. The plans and papers furnished for my guidance, in most cases, proved perfectly useless, and had to be set aside, and the boundaries determined, as far as practicable, according to their description given in the Register of Sale.”

PERIOD OF SURVEY OPERATIONS IN DISTRICT KAMROOP.

124. The field operations extended over a period of six months, and the Party retired to recess quarters in the latter end of May 1864, by which time the greater portion of the Establishment was laid up either with fever or dysentery.

125. Adverting to para. 155 of the printed Report on the operations of the surveys in the Lower Provinces regarding Mr. Nicolson's work of season 1863-64, specimens of which had been specially called for by Colonel Thuillier, Surveyor General, a separate Report* has already been submitted to the Government; no further mention need, therefore, be made here, or details entered into, beyond stating that the out-turn of that season had to be condemned. The work of the present season appears to be more reliable, but being mostly in detached portions, it is more difficult to form a correct judgment of it. The whole of the plans and records, &c., of the season have, however, been handed over to be tested by the Revenue Surveyor in charge of the 1st division, which has now entered, and commenced the regular survey of the district of Kamroop.

OPERATIONS IN THE WESTERN DOOARS ADJACENT TO COOCH BEHAR.

126. On the 27th July 1865, Mr. Nicolson was directed to proceed to Cooch Behar and place himself under the orders of Colonel Bruce, c. b., Chief Civil and Political Officer, with a view to running route surveys across the country, between Cooch Behar and the northern limits of the Bengal Dooars, and obtaining as much information as possible regarding the courses of the rivers, &c. He is still employed on this duty, and will continue to be so until the end of March next, when the Commissioner has intimated his services can be dispensed with.

ABOLITION OF THE 3rd DIVISION WASTE LANDS SURVEY, AND ITS ABSORPTION WITH THE 1st DIVISION, LOWER PROVINCES SURVEY.

* No. 3155, dated 30th August 1865, to Board of Revenue, Lower Provinces.

127. Mr. Nicolson will then proceed to Gowhatty and make over all instruments, tents, &c., &c., belonging to the 3rd Assam Topographical and Revenue Survey, which will be amalgamated, under the sanction and orders of the Government of Bengal, marginally quoted,* with the 1st Division of Revenue Survey, under Mr. R. H. Smart.

128. Mr. Nicolson will then avail himself of the retiring pension which he has obtained under the orders of Government marginally cited,† but has postponed taking, until the completion of the work on which he is at present employed. Mr. Nicolson's services in the Survey Department extend over 30 years.

JAMES E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General, and

Supdt. of Revenue Surveys.

TABLE A.

General Return of Professional Work for Season 1864-65, from 1st October 1864 to 30th September 1865, exhibiting cost, areas, and average rates per Square Mile and Circuit.

Division and Superintending Officer.	Name of District.	Number of villages.	Average size of village circuits in acres.	AREA SURVEYED IN		Cost of professional charges, including Military Allowances and Contingencies.	Average rate per square mile.	Average rate per village circuit.	REMARKS.
				Acres.	Square miles.				
<i>First or Northern Division.</i>									
R. B. Smart, Esq., Revenue Surveyor	Nascolly	817	1,144	9,35,335	1,462	Rs. A. P. 45,532 9 1	Rs. A. P. 21 8 6	Rs. A. P. 55 11 8	Mohalenny charges excluded, Rs. 600.
<i>Second or Southern Division.</i>									
Capt. D. Macdonald, Revenue Surveyor	Maunbhoom	2,688	242	6,50,075	1,016	49,354 8 1	48 9 5	18 5 9	Ditto ditto, Rs. 352.
<i>Third or Eastern Division.</i>									
N. T. Davey, Esq., Revenue Surveyor	Sylhet & Cachar	465	850	6,53,813	1,021	50,823 9 5	49 12 7	(a)	Ditto ditto, Rs. 505-1.
<i>Fourth or Western Division.</i>									
Lieut. W. J. Stewart, Rev. Surveyor	{ Sarun, Champaran, Gomulpour, Patna, and Tirhoot ... }	1,262	610	7,69,325	1,202	48,207 0 9	40 1 8	38 3 2	Ditto ditto, Rs. 630.
<i>Fifth or Bengal Doars Division.</i>									
J. H. O'Donel, Esq., Rev. Surveyor	West Dooars	21 Circuits	.....	3,29,301	175 (b)	18,993 8 1	108 8 7	Topographical	
<i>Sixth or Hazareebaugh Division.</i>									
Major G. H. Thompson, Revenue Surveyor	{ Lohardugga Hazareebaugh (c) ... }	862	542	4,67,028 5,91,731	730 924	50,469 5 11 15,000 0 0	60 2 6 16 3 7	56 8 9 Topographical	
Mouzawar	.....	6,094	528	38,93,155	6,084	2,44,387 1 3	40 2 8	34 6 2 (d)	
Topographical	.....	.....	.....	9,21,032	1,099	33,963 8 1	30 14 11	.....
Total and general average	.....	.....	.....	48,14,187	7,183	2,75,380 9 4	38 12 1	34 6 2 (d)	

	Name of District.	Number of Grants, Estates, &c.	Average size of Grants, Estates, &c.	AREA SURVEYED IN		Cost of professional charges, inclusive of Contingencies.	Average cost per acre.	Average cost per Grant, Estate, &c.
				Acres.	Square miles.			
REVENUE & TOPOGRAPHICAL SURVEY.								
<i>First or Dejecting.</i>								
E. T. S. Johnson, Esq., Assistant Revenue Surveyor, in charge ..	Hill Division ..	89	1,061	94,408	147	Rs. A. P. 11,857 1 1	0 1 11	Rs. A. P. 127 9 9
		Teraal ditto ..	178 Jotes, 55 Govt. Lands, &c.	460	1,06,742	167	8,585 13 1	0 1 3	36 11 1
<i>Second or Upper Assam.</i>								
C. Brownfield, Esq., Senior Sub-Assistant Revenue Surveyor, in charge ..	Seebaungor ..	78	1,188	92,652	145	14,010 5 2	0 2 5	179 9 11
<i>Third or Lower Assam.</i>								
J. O. Nicolson, Esq., Officiating Surveyor, in charge ..	Kanroop ..	35	785	27,474	43	15,810 14 5	0 9 2	451 11 10
<i>Chittagong Detached Party.</i>								
J. H. O'Donel, Esq., Revenue Surveyor ..	Chittagong ..	42	2,626	1,10,284	172	21,511 14 7	0 3 1	512 3 0
	.....	478	903	4,31,560	674	71,276 0 4	0 2 7	149 1 10
	Abstract Total	...	...	52,45,747	7,857	3,49,656 9 8	.....	.....
	Metalwary Charges	...	...	.....	...	2,067 1 0	.....	.....
	Grand Total	...	...	52,45,747	7,857	3,51,743 10 8	39 0 9(c)	34 10 8(f)

(a) Average rate per village circuit cannot be given.
 (b) Three hundred and forty square miles of boundary survey, in addition to the 175 square miles, have also been done.
 (c) Re-survey of M. C's. 8 and 9, surveyed in season 1860-61.
 (d) Exclusive of the 3rd Division Lower Provinces, Survey and Topographical Work.
 (e) Exclusive of the Waste Lands Survey.
 (f) Exclusive of the Topographical, Waste Lands, & 3rd Division, Lower Provinces, Surveys.

JAMES E. GASTRELL, *Lieut. Colonel,*
Offg. Deputy Surveyor General, and
Superintendent of Revenue Surveys.

OFFICE OF SUPERDENT OF REVENUE SURVEYS;
 Calcutta, the 29th January 1866.

APPENDICES.

Extract from Annual Report from MR. R. B. SMART, Revenue Surveyor, 1st Division, Lower Provinces, to the Officiating Deputy Surveyor General and Superintendent of Revenue Surveys,—No. —, dated 1st November 1865.

Descriptive Geography.

* Dukhin Shahbazpore.
Hattyah.
Sundee.
Bidon.
Siddee.
Nulcheera.
Baroda.
Manpoora.
Folcon Chur.
Toom Chur.

4. "The principal islands included in the season's operations are marginally noted.* The smaller islands and sand-banks are constantly changing their position and appearance, and appear to be ascending the stream. They are all subject to continual diluvium, so that while accretions form on one side, diluvium to some extent takes place on the other, but the general tendency is to shoal up the beds of the rivers."

5. "The khalls in Sundee, Dukhin Shahbazpore, Siddee, Bidon, &c., are navigable for boats only during flood-tide; during ebb, they are left dry, or with very little water; in fact, the khalls are filling up fast. The khal leading up to Noacolly Station can only be entered at flood-tide; during the ebb, boats are obliged to anchor mid-channel between Hattyah and the mainland. The natives record the fact that the sea once extended up to Noacolly, or Soodeeram as it was then called. The Station is now 8 miles from the sea."

6. "The rivers between Siddee and Bidon, and Bidon and Sundee, are dry during ebb-tide. The passage between Siddee and Becotshoo Chur is navigable only during the flood tide, and between Hattyah and Sundee, the river is studded with bars."

7. "The operations of the Megna River are materially assisted by the action of the sea; the action of the bore or tidal-wave is very striking on the eastern bank of Hattyah, where the soft deposits are scooped out, and the island has suffered considerable destruction; several villages are swept away in a few hours, bars and sand-banks are produced, and which, in many cases, act as barriers to the sea and prevent its further encroachment. These changes, though of merely microscopic value as regards the dimensions of the globe itself, are of immense extent and importance with reference to the inhabitants of the islands."

8. "Kallee Chur to the south of Sundee is a new formation; vegetable life is fast appearing on it, the development of the plants is doubtless dependent on the soil rich in vegetable mould, brought down by the Megna. Luckheedeer Chur to the south of Nulcheera, though a small island, is covered with large forest-trees; Balam boats from Chittagong and Backergunj carry away large quantities of wood during the months of December, January, and February. The island of Manpoora is fast disappearing, and will soon be submerged beneath the waves."

9. "Though the incursions of the sea occasion disastrous results, the beds of the rivers are gradually and surely rising, and will doubtless at some future time change from sea to dry land."

10. "Some months ago, it was noticed in the 'Friend of India' that the island of Sundee was, in the year 1830 or 1833, submerged beneath the waves; this has no foundation in fact. The oldest inhabitants of the island, men who have never left the place, know nothing about it. There are mosques on the island, said to be 200 and 300 years old."

11. "About the middle of the 16th century, the islands of Sundee and Hattyah formed a part of the kingdom of Arracan. Sundee is described by the Venetian Traveller, Cæsar Frederick, about the year 1565, as one of the most fertile places in the country, as being densely peopled and well

Historical Geography.

cultivated. He mentions the extraordinary cheapness of provisions here, and states, that 200 ships were laden yearly with salt, and that such was the abundance of materials for ship building in this part of the country, that the Sultan of Constantinople found it cheaper to have his vessels built here than at Alexandria. Herbert, also, about 80 years afterwards, bears testimony to the

* Dr. James Taylor's Topographic and Statistic of Dacca.

great fertility of this island, which he designates as one of the fairest and most fruitful spots in all India."*

12. "About the year 1600, a number of Portuguese adventurers settled on the coast of Chittagong and Arracan, and became very troublesome neighbours. In 1607, the King of Arracan determined to root them out of his dominions, and put many to death; the rest escaped in nine or ten vessels to the island of Sundeeep and turned pirates. The Mogul Governor seized upon all the Portuguese within his reach, and having put them to death, went in search of the pirates. They were anchored off Dukhin Shahbazpore. A naval battle ensued. The Moguls were entirely defeated. The Portuguese returned in triumph to Sundeeep. In 1610, the King of Arracan made a league with them, and they agreed to invade Bengal together by land and by water. Their united forces attacked and took Bullooh and Luckheepore; but a strong Mogul Army marched against them, and totally defeated the Arracan troops. Immediately after the Portuguese and Arracanese had been defeated, Gonzales, the Portuguese Captain, invited the Captains of the Arracan vessels to his own ship, and put them to death. Gonzales afterwards attacked the city of Arracan, but was repulsed. The King of Arracan pursued him, took Sundeeep and all the neighbouring coasts, ravaged the country far and near, burnt the towns and villages, and carried the inhabitants into slavery. It is supposed

† History of Bengal.

that it was this and succeeding inroads of the Arracanese which created the Soonderbuns."†

13. "At the upper part of the Bay, the bore, or tidal-wave, is scarcely observable. At the mouth of the Fenny River, and to the north of Becotshoo Chur, between Siddee and the mainland, the appearance is remarkable. With a strong southerly wind, the largest waves are produced. The tidal-wave flows up the Sundeeep Channel, passing into the Rivers Fenny and Baumnee, with great rapidity. This wave is met by a counter current from the west of Sundeeep, Bidon, and Siddee; the water is then dashed impetuously onward, passing Toom Chur, the northern part of Hattayah, and exhausts itself a little to the north of Bhowaneegunj Khall, the northern limit of the bore. The wave assumes the appearance of a white wall from 14 to 20 feet in height; the velocity is about 15 miles an hour. The height to which the wave rises is greater in the small rivers than in the open sea between Sundeeep and Hattayah. Its greatest height is just before it dashes into the Fenny River. The maximum rise of the tide on the eastern coast is said by the natives to be 80 feet. North-east of Sundeeep, where the tide runs with great velocity, the rise at high water spring-tides is fully 40 feet. On the eastern side of Hattayah it is 20 feet; the surface of the island is then only 3 or 4 feet above high water mark, or the level of the sea. A powerful current runs between Manpoora and Shahbazpore, where the channel is very narrow and very deep. The current sweeps along the eastern side of Shahbazpore, without any obstruction, until it arrives off Folcon Chur; it is then broken into two smaller streams, and joins the current of the Hattayah River."

14. "The Isha and Teetooolea Rivers between Backergunj and the island of Dukhin Shah-

Saltiness of the rivers.

bazpore are less salt than the rivers east of the island; this is owing to the volumes of fresh water brought down by the

Megna and Wreal-Khan Rivers."

15. "Loud shouting of *bân bân* from the boatmen announce the appearance of the flood, which is seen 5 or 6 miles off. Boats left high and dry in the khalls are afloat in less than half an hour after the first rush of the tide. Even the birds feeding on the sand-banks fly off with the greatest rapidity at the first noise of the bore."

Extract from Annual Report from CAPTAIN D. MACDONALD, Revenue Surveyor, 2nd Division, Lower Provinces, to the Officiating Deputy Surveyor General and Superintendent of Revenue Surveys,—No. 4, dated 1st November 1865.

10. "The tract of country surveyed during the season forms the south-eastern corner of the Manbhoom District. It is situated between the meridians of 86° 30' and 87° 15' east longitude, and the parallels of 22° 15' and 23° 13' north latitude. It is bounded on the north by last season's work; on the east by District Bancoorah; on the south by District Midnapore, and on the west by the unsurveyed portion of Manbhoom."

The part of Manbhoom surveyed.

Situations.

11. "Compact in form, having a length of 45 miles, and a breadth of 50 miles, it contains seven entire Pergunnahs, and a portion of an eighth. It is traversed by the Seleye and Cossye Rivers, together with a large tributary of the latter, and several smaller streams, nearly all flowing in a south-easterly direction. The country for the most part is wild, barren, and uninteresting. It is pretty well covered with tree and bush jungle. The soil is hard and of no great depth. The staple is rice, and this seems to be grown principally for home consumption. In some parts the jungle is dense and continuous, and abounds in all kinds of wild animals, including tigers, leopards, bears, hyænas, and different kinds of deer. A few isolated hills dot the country here and there. In the south-western corner there is a group of low hills covered from crest to base with thick jungle. The undulations are very considerable, and these, combined with the thickness of the jungle, obstruct the view in all directions.

Extent and general character.

Places of note.

Roads.

The principal villages are Manbazaar, Ambeekanuggur, Soopoor Khahas, Raipoor, and Shamsunderpoor. There is no regularly made road, either 'kucha' or 'pucca,' in this portion of the district, beyond a well defined cart-track, connecting the places of note. Not a bridge of any kind is to be found. After a few days of rain, the rivers rapidly fill up and become rushing torrents, and communications are thus interrupted at times even in the cold weather."

12. "The principal land-holders are the Rajahs, who take their titles from the different Pergunnahs. They generally lay claim to Rajput descent. The great run of the population are Bowries, Dangahs, and Sonthals, with a sprinkling of Bengalees. Several Brahminical villages are to be met with in this as in other portions of Manbhoom."

Zemindars and inhabitants.

Extract from Annual Report from MR. N. T. DAVEY, Revenue Surveyor, 3rd Division, Lower Provinces, to the Officiating Deputy Surveyor General,—No. —, dated 10th November 1865.

5. "The whole effective strength of the Survey had been concentrated by the end of April, for the completion of the Sylhet District this season; but after accomplishing whatever was possible under the combined disadvantages of physical difficulties, and an Establishment weakened by sickness, I was obliged to abandon the attempt and leave 100 square miles in Sylhet unfinished. During part of April and May one-fourth of my Establishment was non-effective from endemic fever, the effects of which have been felt, even during the recess, by both European and Native Assistants."

12. "Frontier Circuits Nos. 10 and 11 include the lands beyond the limits of the demarcated portion of Sylhet, and which I assume to be waste lands, pending the decision of the Special Court* empowered to adjudicate on the claims to waste lands in Sylhet. The pestilential valley between the Jampoi and Chatterchoora hill ranges, is covered with impenetrable jungle and swamps, and deserted by man and

Frontier Circuits and Waste Lands,
District Sylhet.

* Under Act XXIII of Section VII.

beast. No detail survey of the Frontier boundary or topography in such a country was practicable. It is shown blank on the map, and an explanatory note describes the unsurveyed tract. The chief streams* were traced southward for 9 miles in this valley, and the triangulations have fixed absolutely the position of the highest peaks of the hill ranges."

* Lungai and Singla Nuddées.

13. "The survey of the boundary between Sylhet and Hill Tipperah was commenced from Hararguj, Great Trigonometrical Survey Station, the closing point of the preceding season's operations on this Frontier. From Hararguj, for the first 20 miles, the boundary was surveyed in detail to the source of the Thal Nuddee, and thence to Chatterchoora Hill, across the pestilential valley referred to in the preceding para. ; the required points for defining the Frontier were fixed by triangulations, carried on in a connected series as described in para. 8 of this Report."

14. "Frontier Circuit No. 9 of the preceding season's survey was altered, and 9,872 acres of land in excess included in Sylhet, owing to the discovery of a stream further south, identical with the Dingai Churra of Fisher's Map, the existence of which was denied by the Agents of the Rajah, till actually identified by survey as the Dingai Churra."

17. "In Sylhet there remain for survey only 100 square miles to complete the district.

Estimated area for survey.

† No. 782, dated 22nd February, from Junior Secretary, Government of Bengal, to Secretary Board of Revenue.

‡ From MAJOR H. S. BIVAR, Deputy Commissioner, Cossyah and Jynteah Hills, to Superintendent of Survey, 3rd Division,—No. 0103, dated 20th March 1865.

Para. 3rd.—"I have further to observe that apart from the time which it will take to issue notices properly, that I have much important business to transact in the hills which will keep me fully occupied for sometime to come, and taking these matters into consideration with the fact that the season is now advanced, and that the ground at the foot of the hills with the first heavy fall of rain, which may be looked for daily, will be most unhealthy, I would propose, and shall submit through the Commissioner of Assam for the consideration of Government, that we be empowered to defer the settlement of the boundary until December next."

met during the season to settle this boundary. The Civil Superintendent proceeded to the Frontier, and a Survey Party was withdrawn from village work to accompany him, when the Deputy Commissioner's letter, as per margin,‡ stopped further proceedings; and this Frontier work remains to be completed during the ensuing season, when a Survey Party will have to be sent from Cachar to survey the boundary that may be agreed to by the Civil Officers."

18. "The portion of Cachar demarcated during the past three years, I estimate to contain

District Cachar.	
§ Area surveyed in 1864-65.	
	Sq. Miles.
Villages	250
Grants	860
Total	1,110

an area of 450 square miles of villages in the plains, and 900 square miles of Tilahs or high lands taken up for Tea cultivation. About 200 square miles of villages and 40 square miles of Tea Grants have been surveyed, leaving a balance of 1,110 square miles§ of demarcated lands for survey. Besides the above area, there are about 3,000 square miles of waste lands within the boundaries claimed for the district, but with these unallotted hill and jungle tracts the ensuing season's survey has no immediate connection. Captain Stewart, Deputy Commissioner of Cachar, estimates the area of the district at 5,000 square miles, and describes its limits as follows :—

North.—The water-shed between the Berhampooter and Borak Rivers.

South.—(Uncertain), the water-shed of the Borak River.

East.—The Jheerce, Borak, and Tepai Rivers.

West.—The Soorispoore hills and Soorma River."

19. "The thakbust proceedings in the District Cachar having been finally completed, the Civil Establishment has been reduced. The demarcation marks, it is supposed, will be preserved till the completion of the Professional Survey. In every instance, however, in which the temporary field marks have not been kept up during the past rains, the duty of tracing out boundaries according to thakbust maps will devolve on the Professional Survey; and the ensuing season's out-turn in District Cachar will greatly depend on the extent this preliminary work to survey has to be performed by my Establishment in addition to legitimate survey duties."

Extract from Annual Report from MR. J. H. O'DONEL, Revenue Surveyor, 5th Division, Lower Provinces, to the Officiating Deputy Surveyor General and Superintendent of Revenue Surveys,—No. 24 A, dated 11th November 1865.

34. "The Dooars are situated to the east of the Teesta River, below the foot of the hills, and extend as far south as the borders of Rungpore and Cooch Behar. Along this southern boundary there is a belt of cultivation and pasture land, in some places 12 miles broad, in others 2 miles. The average breadth is about 6 miles. This tract is cultivated chiefly by Hindoos called Rajbungsees. The principal crops are rice and tobacco; jute and sugar-cane are also cultivated. The villages are small scattered hamlets, with two to eight houses, and a few have gardens of mangoe and betel-nut trees. The best part of the land revenue is obtained from this part of the country, which is a continuation of the cultivated tracts in the adjacent districts. Minagooree and Patlakowa are situated within this open tract."

35. "The Turai commences from the north of the cultivated and open country, and extends for 20 miles to the foot of the hills. It is covered with high grass and reeds, from 10 to 30 feet high, intermixed with trees. The banks of rivers and streams are belted with sál and seesoo trees, and the soil, for at least 10 miles below the hills, is, in many places, covered with gravel and boulders. Heaps of stones are seen on the sides of the very few cultivated fields met with. Between Balla and Chamoorchee there is a great scarcity of water, many of the streams are dry beds of stones. In some of the Mech villages water was brought daily for domestic purposes from a distance of 8 or 10 miles. The inhabitants of the Turai are the nomadic tribe of Mech, with a few Garrows, who cultivate cotton, and barter it for rice and other articles. The rice cultivated is not sufficient for their own wants. The Mech villages are few and far apart, separated by large uninhabited tracts."

36. "Towards the eastern bank of the Juldoka River, fruit trees mark the sites of numerous deserted villages, and the ridges of old cultivated fields appear where the grass jungle is burnt down."

37. "Minagooree, the chief Civil and Military Station in the West Dooars, is situated in an open plain, midway between the Teesta and Juldoka Rivers, on the old bed of the Durlah or Juldoka River, 7 miles from Julpigoree. The Thannah, Bazar, and new native town are on the west bank. The Civil Station is on the east bank; the Military Cantonments commence a mile lower down, and extend about a mile north of Julpesh Temple. The old town consisted of a few huts round the Bazar, surrounded by a bamboo stockade. Minagooree is almost entirely a new Station. Patlakowa is 36 miles to the east of Minagooree, and about a mile from the haut of the same name, close to the Cooch Behar boundary."

38. "There are no villages of note; the open country is dotted with small villages of 2 to 8 houses; the names of the principal hauts or markets are Domohancee, Chengmaree, Kyrantee, Latagooree, Gopaul-guaj, Amgooree, Ramshai, and Fallakata. There are no huts, or large trees to mark the sites of these hauts."

Police Stations.

39. "Small detachments of Police are stationed at Chengmaree, Domohance, Latagooree, and Doobgooree."

40. "The principal rivers are the Teesta, Juldoka, and Toorsa. The Teesta River is broad; it has a strong current, and is crossed by ferry boats.

Rivers.

The Juldoka River, about 12 miles to the eastward, is about half a mile wide, with low banks. During the dry weather, the channel varies from 200 to 1,000 feet. It is fordable in most places, but there are quicksands opposite Choorbundur, where the road crosses to Balla. The Toorsa River is a rapid torrent flowing in a bed of stones for about 12 miles below Balla; it has a strong current lower down, and is deeper as it enters alluvial soil. It is crossed by a ferry boat on the route from Fallakata to Patlakowa. Between the Juldoka and Toorsa Rivers, there are 2 small rivers called the Doodooa and Moojnai, both crossed by ferry boats near the Cooch Behar boundary, but 20 miles further north; the former is called the Rehtie Nuddee, in April its bed was perfectly dry; the latter is a small streamlet at the foot of the hills. Boats were not seen on these rivers, and, except the Teesta, they are useless as lines of water communication."

41. "Efforts were made to open out roads for troops from Minagooree to Julpigooree,

Roads.

Dalimkote, Balla, and Chamoorchee. The level country offers great facilities for cart-roads; in most places a road has merely to be marked, and the grass jungle cleared, but in the Turai it is impassable except through the regular thoroughfares. A cart-track was opened out from Minagooree to Latagooree haut on the skirts of the Turai, to bring away timber for the public buildings in the Cantonments of Minagooree."

42. "Julpigooree has been a small Civil and Military Station for many years, the

Want of local knowledge much felt.

apprehensive jealousy of the Bhooteeahs prevented British subjects from entering the country on the other side of the Teesta River. The want of local knowledge was at first much felt. The armed Police actually took a circuitous route and made 4 marches from Julpigooree to Minagooree, situated 7 miles to the east across the river, and *visible* from the banks of the tank near the Rajbaree. Endeavours have been made to obtain as much geographical knowledge of the newly annexed country as could possibly be done within the short period survey operations could be carried on."

Extract from Annual Report of Chittagong Waste Land Survey for Season 1864-65.

"The tract included in Main Circuits Nos. 20 and 21 is hilly and undulating throughout, the hills are formations of soft clay slate and sandstone; the latter is, in many places, ferruginous. The soil in the valleys is sandy and clayey. The timber, thatching grass, cane, fuel, &c., &c., used for domestic purposes by the villagers inhabiting the plains on either side are obtained from these hills, and the only pasture lands for their cattle are also in the hills, along the banks of streams in the valley. During the summer months, March, April, and May, the paddy lands are scorched, and scarce a green spot is to be seen for miles, except where irrigated naturally or artificially. Some of the Planters have already rented out pasture lands to the villagers. A species of the Indigo plant is found throughout the district."

"The only plantations opened are on Chotakoomara, Ghora Mara, and Damy Streams, and Muddun Pass, or Dhalla. The Tea plants were but an inch high in the nurseries when the survey was made, but from late accounts, they seem to be progressing very favorably."

"The animals that inhabit these hills, and which are found in abundance, are tigers, leopards, tiger-cat, jackals, foxes, porcupines, wild pigs, and several species of deer. (Birds),—pea fowls, black and speckled pheasants, hill pigeons, which is a larger and prettier bird than the domesticated species, green pigeons, turtle and ring doves, hornbill, and toucan, and numerous other species of smaller birds."

"The Passes, or Dhallas, are mostly through streams, with but one ascent and descent over the main ridge to the stream on the opposite side. They are chiefly used by foot passengers, peasants, who carry the produce of their fields to the several markets on either side of the hills. All the hill streams are fordable; most of them retain water throughout the year."

"The only places of note are Seetakoond, or Chundernauth, and Barokoondo, where there are salt springs. These springs emit inflammable gas. Pucca chimneys have been built over them, through which the gas escapes, and which being touched with a flame burns for days together. At Seetakoond there are fifteen pucca temples, and three at Barokoondo; in both places the god Mohadeb is principally worshipped. Devotees from all parts of India visit the shrines at the springs, which are held only second in veneration to Juggernaut. It is estimated that at an average not less than 10,000 persons worship here annually. A fair is held at Seetakoond during the month of March."

"The present season's work in the Tek Naaff hills lies on the northern boundary of District Akyab, between the Bay of Bengal and the River Naaff; the area of the block, approximately, is 150 square miles; this tract is sparingly inhabited, and is covered with jungle."

Extract from Annual Report from MR. E. T. S. JOHNSON, Assistant Revenue Surveyor, in charge 1st or Darjeeling Revenue and Topographical Survey, to the Officiating Deputy Surveyor General and Superintendent of Revenue Surveys,—No. 7, dated 9th November 1865.

23. "Before going further it may be as well for me to state that the cart-road from Kurseong to Darjeeling is now open for wheeled conveyances. The Darjeeling Bullock Train Company's carts may be seen daily passing up and down with packages. The remainder of the new road is still incomplete between Kurseong and the plains, and will, I believe, not be opened for another two years."

25. "In the Darjeeling Hill Territory only one fair is held annually at Sungut on the Ringreat Jhora, to the west of the Darjeeling Station, in the Estates held by Cheebo Lama, and this has only been got up by Cheebo Lama since the last two or three years; the principal things sold there being cattle, poultry, brass-plates, &c., and the different products of the hills in the immediate vicinity. The Government, I believe, are also trying to get up a fair at Lebung near Darjeeling, to attract the Thibetians and Chinese Tribes beyond the Snowy Range, to more intimate intercourse with us than at present. A small gathering did take place last year chiefly of horse-dealers, but it was nothing to speak of."

Extracts from MR. COWLEY'S Report.

"The nature of country surveyed is low and marshy, for the most part covered with impervious forests, and long grass over 20 feet in height. The climate is very unhealthy, and certainly most unfavorable to European constitutions, owing to the deadly fevers created by the pestilential vapours that rise from it. This is well known even to the Hill Tribes. Fevers and dysentery are the most prevalent diseases. In illustration of the exceedingly insalubrious nature of the country, I may mention that out of a batch of 30 Nepalese coolies, engaged in November last, 9, including 2 "Sirdars," died from fever, and the rest taking fright, left the work without leave or pay. It was then that I also had a severe relapse into "jungle" fever, with which I had been attacked in the Terai the previous season, and was obliged to apply for a month's privilege leave. My health is greatly impaired, and I fear it will be long before I completely recover."

“The high road from Carragola to Darjeeling, *via* Silligooree, passes through this tract. It is in pretty good order, considering the frequent inundations from the overflow of streams from the hills. It has wooden bridges over the rivers and large streams. From the Mahanuddy to the Khuprail Bridge, the road passes through an open portion of the country, with rice-fields on each side; at Khuprail, it enters the forest-land to Punkabaree; this road in time, will, I think, be abandoned for a shorter and more convenient one—the new cart-road from Silligooree to Darjeeling which is completed up to the foot of the hills. The latter is a fine broad road elevated about 4 feet above the level of the plains, with masonry bridges over all the streams except the Punchunaie.”

Roads.

“The road next in importance is the one leading from the Thannah and Haut of Mattigurha to the Teesta River, where there is a Ferry to the Dooars of Bhootan. It passes for about 5 miles through the district of Rungpore, and is rather a well beaten track. I believe it was made by Messrs. Dear and Rundle for the conveyance of timber felled by them in the Chumpasaree Jhar. There is no direct road to the Teesta River through this territory.”

“The only village of any importance is Mattigurha, where a large ‘haut’ or market is held twice a week. Large quantities of rice, vegetables, fruits, also poultry and cattle, copper vessels, and cloths are sold or bartered for hill goods.”

Villages.

“During the cold season, December, January, and February, the market is always well attended, the Thibetians, Bhooteeas, Lepchas, &c., flocking down with blankets, yâk-tails, sheep, ponies, dogs, walnuts, &c.”

“A market is also being established at Sookna, on the new cart-road at the foot of the hills.”

“The population comprises Rajbungsees, Dhemals, Dhangurs, or “palkee-bearers,” Mahomedans, Liquor sellers, Naies, Mallees, and Mechias, all of whom, with the exception, perhaps, of the last mentioned, are known to the public. It might, therefore, not be amiss for me to give a short description of them.”

Population.

“They are a section of natives, who live in secluded spots, in the densest forests at the immediate base of the mountains. They are generally a fair race, much resembling the Nepalese in features, with strong muscular limbs, and about 5 feet 6 inches in height. They are a wandering race, seldom staying for more than two years in one spot, and live principally by fishing, hunting, the cultivation of cereals and cotton, which they either barter for the other necessaries of life, or sell.”

Mechias.

“They pay, I believe, a capitation tax of 1 Rupee per axe, *i. e.*, 1 Rupee per man to Government, and are allowed to cultivate as much as they please in the Government forests. They possess large herds of buffaloes; pigs and fowls are also reared by them.”

“In the cultivation of cotton large tracts of valuable forest are destroyed. The Mechias cut down the timber, and burn it to serve as manure for the cotton, without which it will not grow; yearly they are obliged to seek fresh spots for the purpose, and we therefore meet with vast tracts stripped of their finest trees, the old stumps only remaining. The extent of cotton cultivation by the Mechias in the Government forests will be seen from the map. At the time of the advance of our force into Bhootan last year, upwards of 100 Mechias came over to our side and settled in the Chumpasaree Jhar.”

Destruction of timber.

“The principal rivers are the Teesta, the Mahanuddy, and the new Balasun. Streams of secondary importance are the Ruktee, Gulma, Punchanaie, and Chamta, with their numerous feeders. I may here state a peculiarity of some of the streams in the Morung or forest; at the foot of the hills, there are numerous streams which flow on for a mile or so, then suddenly sink under ground and

Rivers.

reappear about 6 or 7 miles lower down, leaving the heavy portion of the forest without a drop of water. This peculiarity belongs to the whole of the Morung. The Mahanuddy is the second largest river, but from the point in the hills where it enters the forest till about 10 miles south it is dry in winter. In the rains it is unfordable."

"The soil is generally fertile and well adapted for the cultivation of almost any kind of corn, but by far the greater portion of the country remains in an uncultivated state, and almost wholly covered with jungle."

Soil.

"The principal produce is rice, of which there are several kinds; also cotton, mustard, linseed, hemp, tobacco, 'bhang,' chillies, onions, and garlic, &c."

Produce.

Fruit.

"Plantains, guavas, pine-apples, and jack, 'kattal.'"

"The cultivation of tea is being rapidly extended into the Terai, and from what I see, and the opinion of experienced Planters, it is likely to answer better than the hills, the plants growing more rapidly, and the labor being cheaper. Hence there is a great demand at present for the Terai lands. Every available piece is bought up, and a great many of the 'Jotdars' have sold their lands to Europeans."

Tea.

"The principal forests in this tract are the Moorgaon Jhar, 1,876 acres of which covered with 'sâl-trees,' have been sold to Mr. P. H. Scanlan. The Chumpasaree, Lohagurree, and Nagurkote Jhars have also extensive tracts of 'sâl' and 'sissoo' trees on them. Besides the 'sâl' and 'sissoo,' the other trees are much the same as those described in my last Report."

Forests or "Jhars."

Police Stations.

"There are three Police Stations: 1st at Besurbatty on the high road to Carragola; 2nd at Mattigurha; 3rd at Chumpasaree."

"Such a country is of course the favorite resort of all kinds of wild animals. Tigers and leopards are numerous all over the district. Elephants and rhinoceroses have their haunts on the banks of the Teesta, after the river leaves the hills. Bears are also found at the foot of the hills."

Wild animals.

"Deer of various kinds, such as the elk, or deer with antlers, the 'cheetul,' or spotted deer, and the common hog-deer; but in a country where one loses himself even on the back of an elephant, the game is very difficult to be got at."

Deer.

"Among the feathered species are the pea-fowl, wild-fowl, much resembling the domestic, the black partridge, quails of three or four kinds; doves and snipe; ducks, however, do not frequent any of the numerous marshes."

Birds.

Extract from Annual Report from MR. C. BROWNFIELD, Senior Sub-Assistant Revenue Surveyor, 2nd Division, Upper Assam Revenue and Topographical Survey, to the Officiating Deputy Surveyor General and Superintendent of Revenue Surveys,—No. 11, dated 26th October 1865.

4. "The principal portion surveyed during the past season is situated a few miles south of the Brahmapootra, and is bounded as follows:—On the north by the town of Jorehaut and the Geerhallee; on

Nature and aspect of country.

the south by the Dodur Allee as far as Golaghaut; on the east by the former season's work; and on the west by the Kamarbandee and Akur Allees. The country is an inclined plane, the land in the vicinity of the Brahmapootra being low and marshy, but attaining a slightly increased elevation as it recedes from the great river; the tracts of forest land then become more numerous, and the timber of larger growth; the forest wastes are generally the highest portions of the plane, and above the inundations of the Brahmapootra, and of those of its tributary streams; they are not confined to any particular sites, but lie scattered about in patches throughout the country; the interjacent low lands being for the most part cultivated in paddy, which is the only cereal raised in any quantity. 'The aspect of the country is much diversified; a stiff retentive clay abounding in iron nodules reposes on the surface, which, furrowed by numerous ravines or water-courses, presents, in some parts, so broken an appearance that the culturable lands are divided in a singular manner into innumerable small sunken patches,' termed Holas."

5. "The prevailing characters of the soil, in the high lands, are lightness and porousness, and its prevailing color is yellow or reddish' yellow; the soil of the low lands is for the most part of a light yellow clayey texture."

Soil.

6. "In consequence of the mountain ranges, the numerous marshes interspersed throughout the country, and the extensive tracts of dense tree and grass jungle, the temperature is considerably lower than that of Bengal; the ever-green forests cool the air by evaporation; by the close shade they afford, they prevent the ground from being heated by the sun's rays, and giving back the heat at night. 'With regard to humidity the country may be said to enjoy the maximum.' The past season has been a remarkably sickly one, during which both Europeans and Natives have suffered alike; the prevailing diseases were fevers, bowel complaints, and cholera; the Europeans suffered chiefly from the first two, which can only be attributed to their living throughout the rains in the heart of the forest, where there can never be a free circulation of air, and where the atmosphere must be highly charged with moisture, and the gaseous exhalation of decaying vegetation; as if this were not sufficient to cause disease, they invariably expose themselves to the deleterious effects of the night air, which in such localities must be pernicious in the extreme."

Climate, health, and disease.

7. "The principal productions are paddy, mustard-seed tea, sugar-cane, kalai, and silk."

Productions.

"A large portion of the population is engaged in the manufacture of silk. The principal kinds produced are, the Mizankooree, the Mooga, and the Eri; the Mooga worm, when fed on the Adakooree or Mozankooree tree (*Tetranthera quadriflora* Roxb.), produces the best kind of silk; when it is reared on the Soom, (*Tetranthera lancifolia* Roxb.) the silk is somewhat inferior. The Eri worm (*Phalona Cynthea*) is fed principally on the Eri tree, (*Ricinus Communis* Linn.) and the silk considered inferior to the former two. The immense sum of money which is annually poured into the country by the Public Works Department, and those engaged in the cultivation of the tea plant, is generally laid out by the Assamese (who receive a large portion) in the purchase of opium (which is largely consumed by all classes of natives, from the child to the grey-headed father), or converted by them into gold and silver ornaments. Their condition has in no way been improved by the acquisition of larger means; their houses, their agricultural implements and cattle, their food and clothing, are of the same description as they were fifty years ago. It is a striking particular that, although they possessed so many and such good roads, (as will be seen in the Circuit Map,) no wheeled conveyances or pack bullocks were ever used, nor do any hauts exist."

Silk.

The following list of prices as compared with those of only 10 years back, will serve to show more plainly how much more comfortable the people ought now to be than their fathers ever were :—

	1855.	1865.	REMARKS.
Coolie labour	@ Rs. 2-8-0 per month...	@ Rs. 5 per month ...	A coolie engaged for the day receives from 6 to 8 annas for eight hours' work.
Opium	@ Rs. 10 per seer ...	@ Rs. 20 per seer ...	
Paddy	8 maunds per Rupee...	2 maunds per Rupee...	
Rice	3 ditto ditto ...	@ Rs. 2-8-0 per maund...	
Mustard seed	1½ maund per Rupee	@ Re. 1-12-0 per maund	
Mezankoree	@ Rs. 10 per seer ...	@ Rs. 30 per seer ...	
Mooga	Silk.. @ Rs. 4 per seer ...	@ Rs. 10 per seer ...	
Eri	@ Re. 0-12-0 per seer ...	@ Rs. 4 per seer ...	
Ivory	@ Rs. 4 per seer ...	@ Rs. 8 per seer ...	
Bees' Wax	@ Rs. 30 per maund ...	@ Rs. 38 per maund.	
Cotton with seed	16 seers per Rupee ...	10 seers per Rupee ...	
Kalie	@ Re. 1 per maund ...	@ Rs. 4 per maund ...	
Land (high)	@ Re. 0-14-0 per Poorah	@ Re. 1-6-0 per Poorah...	
Rice land (low)	@ Re. 1-2-0 per Poorah	@ Rs. 2 per Poorah ...	

8. "The principal roads in the portion of country surveyed were constructed by the former Rulers of Assam; they are the Doodur Allee, which traverses the whole length of the district, from Golaghaut to Jyepore, a distance of about 105 miles. The Sewnee Allee, which connects Jorehaut with Scebsaugor, is passable throughout the year. The Noa Allee, Kamarbanda Allee, and Gurh Allee branch off from Jorehaut and meet the Doodur Allee at different points. The roads are generally raised in the form of embankments to the height of 8, 10, and 12 feet, but, owing to the numerous small streams which intersect the country, and the frail bamboo bridges which last only a short time, most of these fine roads are rendered impassable during the rains. The general mode of transit, when the country is dry, is by elephants or coolies; no hackeries are used by the natives, but wheeled conveyances have lately been introduced by some of the Planters, and found to work remarkably well; the only drawback to a more extensive use of the cart or waggon is the want of good bridges on the main roads, and a few small branch roads."

9. "The villages are in many respects similar to those of Bengal (except that the eaves of the houses are high, and the roofs straight); they consist of a number of straw thatched huts grouped together, without apparently a thought to arrangement or sanitary consideration. Viewed from a distance, they present a picturesque aspect, overhung, as they usually are, with clumps of bamboos, plantain, and soom trees, and small plantations of the betelnut, palm, (Areca Catechec,) but on closer inspection the charm is dissolved; jungle is found growing round every house, and stagnant water and filth of every kind abound on all sides. Small quantities of tobacco, mustard, and sugar-cane are cultivated, generally in the immediate vicinity of the villages, each family raising sufficient for its own wants. The people are clothed principally in cotton and silk stuffs, woven by

themselves; the cotton being procured from the Nagas, between whom and the people of the plains friendly relations have subsisted for a length of time, arising from their mutual dependence for certain articles in which a regular system of barter is carried on. No cotton is grown in the country. The principal marts visited by the Nagas are Golaghaut, Jorehaut, and Rungghora."

10. "The Station of Golaghaut situated on the eastern bank of the Dhunseer River was established in 1843; the land is high and undulating.

Remarkable places.

Being intersected by numerous ravines and hollows (which serve to drain it completely) it is remarkably dry, and is considered one of the healthiest Stations in Assam. The area of the Nuggur Muhal or Golaghaut Mouzah is acres 530-1-32. The revenue collected during the past year amounted to Rs. 277, exclusive of 12-8 per cent., which the Mouzahdar retains as his profit on the total sum for which the land has been settled with each separate ryot; this is done annually; the Mouzahdar being liable during the year for any loss, and gaining a larger profit should he be able to induce other ryots to settle on, or otherwise improve the land. The revenue is employed in repairing the roads and bridges in the Station. Steamers are able to proceed up to the Station from May to September, and small boats throughout the year. The population is about 800 souls. Being the head quarters of a Sub-Division, an Assistant Commissioner is in charge; the only other Judicial Officer is the Sudder Ameen. Numbers of Nagas visit the Station during the cold season, bringing down cotton and vegetables, which they barter for salt, fish, poultry, cows, goats, &c.; the salt is given to them for twice its weight in cotton. The exports are cotton and paddy; the imports, copper, bell-metal, and piece-goods."

"In the troubled reign of 'Goureenath' (about 1788) 'Seesaugor or Rungpore was abandoned for Jorehaut, but even here the Rajah was not safe, and he fled for refuge to Gowhati. On Goureenath's res-

Jorehaut.

toration, Jorehaut again became the seat of Government, and continued so till the conquest of the country by the British Troops; Rungpore (near Seesaugor) was then the first position chosen as the head quarters of Upper Assam, but the place was shortly after abandoned by Captain Nueville for Jorehaut, which place was also in later years the residence of Rajah Poorunder Sing.' The Desoi and Toklai streams flow to the east of Jorehaut; the former is navigable for small boats throughout the year, the latter only during the rains; the land is low and subject to inundation. It is now only a Police Station, in charge of a Sub-Inspector. The bazar contains 160 shops; of these 23 belong to Marwarees or Kyas, who import cotton and woollen cloths, gold, corals, brass and bell-metal plates, iron-pans, iron, steel, and glass beads of various colors from Calcutta; from Seerajunge and Goalpara they import salt, mustard-oil, tobacco, molasses, dall, ghee, &c.; and the articles exported by them are silk, cotton with seeds, mustard-seed, and small quantities of bees' wax, and ivory; they also deal in opium, which is consumed largely by the Assamese. Eight shops are kept by Mahomedans of the country; the chief articles sold are Europe goods and furniture; the rest are petty Dokans, in which rice, dall, oil, onions, &c., are sold."

11. "Marked differences are observable in the physiognomy of the inhabitants of villages not far distant from each other, due to the great variety of races that have from time to time settled in the country;

Population.

some entering it as conquerors, others as refugees; the great majority, however, have the flat features, high cheek-bones, and smooth faces, characteristic of the Mongolean races. In their mode of dress, they have followed the Hindoos, but their hats (Assam Jhapees) are exactly like those worn by the Chinese, which repeated illustrations have made familiar to the European world. The inhabitants are chiefly Assamese (both Hindoos and Mahomedans) and Ahums. There is also a sprinkling of the Meeree, Toorung, Moran, and other tribes, most of whom reside in the jungles, at the foot of the Naga hills; they are of a roving disposition, and seldom cultivate the same tract of land for more than three years. The Ahums first entered the country as conquerors about the early part of the thirteenth century; their descendants have,

however, intermarried with the Assamese, and now only a few remain, who still attempt to retain the old customs and religion of their forefathers. The generality of the people are physically a superior race to the inhabitants of most parts of Eastern Bengal; their complexions are of a lighter color, and they bear a striking resemblance to the Nepalese and other hill tribes; all, with very few exceptions indeed, are engaged in agricultural pursuits, and are a contented and happy people, having few wants, and those few most easily supplied; for paddy is almost the only article they grow for food, the rest being obtainable in their jungles, marshes, and streams. The tender leaves of the Fern are used largely by them in their curries. Their abstinence from animal, and habitual use of vegetable food, the debilitating nature of the climate and the excessive consumption of opium, have in a great measure affected them, but the one great deteriorating cause in Bengal, (early marriages,) does not prevail to any extent except amongst the Brahmins, who are generally delicate, weakly creatures."

Copy of letter No. 98, dated Fort William, 24th November 1865, from LIEUTENANT COLONEL J. E. GASTRELL, Boundary Commissioner, to the Deputy Surveyor General of India.

I have the honor to submit for your information, for incorporation in your Annual Report, and for submission to His Honor the Lieutenant Governor of Bengal, a Tabular Statement of work performed in my Office in connection with my duties as Boundary Commissioner during the past season 1864-65.

2. The duplicate 4 inch = 1 mile Thannah maps of the Purneah District, as sanctioned * No. 3077T, dated 10th September 1864. by Government * of Bengal, have been prepared and issued; one copy to your Office, and the other to the Commissioner of the Bhaugulpore Division. The work was completed, on the 15th September 1865, at a cost of Rs. 3,165-13-1, or Rs. 484-13-1 more than I had at first estimated. This difference in excess was owing to the very much larger size of the Purneah villages, the great amount of details in topography, to the extreme difficulty experienced in tracing out the various villages owing to the way in which the volumes had been originally bound, and to having been obliged to re-protract the Stations before the village maps could be fitted properly one to another.

3. Final descriptive Lists of Zillah, Sub-Division, and Thannah boundaries, together with the Village Transfer Lists connected therewith, of the Patna Division have been prepared, published, and issued to the various local Officers, who will, I trust, find them most useful.

4. Final Thannah Lists of the Behar District, showing names of each village, &c., &c., have also been printed and distributed to the local Officers.

5. Those also of the other districts of the Division have been prepared, and are now undergoing final examination previous to their being printed. The first portion is now at press,

6. Descriptive Statements of Sub-Divisions and Thannahs of the Bhaugulpore Division, and also of the re-adjusted district boundaries, together with Transfer Lists connected therewith, have been prepared and forwarded to the Commissioner of the Division for approval.

7. The new Sub-Divisional Boundary Lists of the Dacca and Rajshahye Divisions are in course of preparation; maps of the several districts of these Divisions have been sent to the respective Commissioners to mark off the newly proposed Thannah boundaries.

8. In both Divisions, transfer from one district to another have been duly provided for, Lists of which have been already drawn up for the Dacca Division; those for Rajshahye Division are in course of preparation.

9. One mile = 1 inch maps of the Cuttack Division have been also sent to the Commissioner, showing the arrangements proposed by this Office, and with a request that he would intimate and mark off on them any further changes which he may deem necessary, either in these or in the former arrangements by Major Sherwill, in District, Sub-Division, and Thannah boundaries.

10. The smallness of my Establishment was much felt during the past years, and on my

Former Establishment.		Present Establishment, as sanctioned by Government.	
	Rs.		Rs.
3 Writers	90	6 Writers	175
3 Draftsmen	72	4 Draftsmen	102
1 Duftry	8	1 Duftry	8
2 Peons	12	2 Peons	12
Total	182	Total	297

recommending an increase in April last, with a view to expedite rapid progress, the Government of Bengal, in No. 2695, dated 15th July 1865, sanctioned an increase of Rs. 115 per mensem to the Establishment. The work of the Office is both

laborious and tedious, and requires great care and patience. I am well pleased with the way in which the Native Assistants have worked during the year. Their conduct merits my full approval.

LISTS PREPARED AND FURNISHED.

Original detailed Statistical Registers of 810 villages of 13 Thannahs of Zillah Behar; 3,763 villages of 14 Thannahs of Zillah Patna; 6,673 villages of 16 Thannahs of Zillah Sarun, Chumparun; 5,069 villages of 7 Thannahs of Zillah Shahabad; and 1,085 villages of 5 Thannahs of Zillah Tirhoot, showing names of Pergunnahs, Thakbust number, area of each village, and the grand totals of each, for each Thannah of the first two districts.

Original descriptive Lists of Zillah and Sub-Division boundaries of the districts of Rajshahye, Rungpore, Pubna, and Moorsheadabad.

Detailed Lists of transfer of 2,585 villages from one Zillah to another, *viz.*, from Moorsheadabad to Beerbhoom, Bograh to Rungpore, Mymensingh to Pubna and Bograh, and from Rajshahye to Pubna.

MAPS PREPARED AND FINISHED.

Scale 1 Mile=1 Inch.

Two maps of each of the districts of Rajshahye, Rungpore, Bograh, Maldah, Moorsheadabad, Pubna, Dacca, Furreedpore, and Mymensingh put together, Sub-Division boundaries entered, and one copy forwarded to the Commissioners of the respective Divisions for approval, and to mark off, in consultation with the Police and Local Officers, any suggested alterations in the boundaries or sites of Sub-Divisions and Thannahs.

Thirteen maps, containing 8,258 villages of each of the 13 Sub-Divisions of Nuddea and 24-Pergunnahs, for the Commissioner of Nuddea.

Six maps, containing 3,253 villages of each of the Sub-Divisions of Nuddea, for the Magistrate of Nuddea.

One map, containing 367 villages of the Sub-Division of Chooadangah, for the Court of the Small Causes of Chooadangah.

Fourteen Thannah maps of the district of Tirhoot.

Sub-Division and Thannah boundaries marked off and colored on the lithographed maps of Patna, Sarun Chumparun, Behar, Shahabad, and Tirhoot, for the Surveyor General's Office.

Four maps of District Sylhet, surveyed in seasons 1860-61,—61-62,—62-63,—and 63-64, for the Commissioner of Dacca.

Scale 2 Miles=1 Inch.

Sub-Division and Thannah boundaries marked and colored on the map of District Tirhoot, for the Commissioner of Patna.

Scale 4 Miles=1 Inch.

One map of District 24-Pergunnahs, for the District Superintendent of Police.

One map of the Salt-water Lake, for the Municipal Commissioners of Calcutta.

Sub-Division and Thannah boundaries of the Patna and Bhaugulpore Divisions, marked and colored on the Atlas Sheets.

Scale 8 Miles=1 Inch.

One map of Rajshahye Division, showing present boundaries of the several districts, for the Commissioner of Rajshahye.

Scale 4 Inches=1 Mile.

Twenty-four Thannah maps of District Purneah, containing 6,000 villages, and an area of 5056.55 square miles.

One Plan of the town and environs of Kishnaghur, for the Municipal Commissioners of Kishnaghur.

Entry of feeder roads in connection with Eastern Bengal and South-Eastern Line of Railway on the maps of Nuddea and 24-Pergunnahs.

(Signed) JAMES E. GASTRELL, *Lt. Colonel,*
Boundary Commissioner.

(True extracts and copies,)

(Signed) JAMES E. GASTRELL, *Lt. Colonel,*
Offg. Dy. Surveyor General
and Supdt. of Revenue Surveys.
