

REPORT

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ON THE

REVENUE SURVEY OPERATIONS

LOWER PROVINCES.

FOR

SEASON 1868-69.

Kamroop,
1869, and of

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Bengal, is
LIEUT. COL. D. C. VANRENEN, R. A., assisted with what he saw,
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8. Major J. Macdonald, my *locum tenens*, who inspected the Survey Establishments, in Assam, took them in the following order :—1st, the 2nd Division, then the Upper Assam Party, and lastly, the 1st Division. He expresses himself extremely well satisfied with all that he saw of Lieutenant Barron's work in the Luckimpore District; he writes of this Officer, that, "no other Surveyor has such difficulties to contend with; that he has the densest jungles to cut through, and is almost wholly dependent upon imported labor." Lieutenant Barron's great exertions successfully to combat the many obstacles which he had to encounter, have so undermined his constitution, that he has been compelled to take furlough on medical certificate, under the orders as per margin*. His departure at such a time, when he had acquired a fair knowledge of the district, is a serious loss to the Government, and the Department in him, lose an accomplished Officer. I trust only for a season. His place, in charge of the 2nd Division, has been taken by Captain W. Osborne, who previous to his departure to Europe on furlough, from which he has recently returned, officiated in charge of a Survey Party in Central India.

9. Major Macdonald, who next visited Mr. Talbot's Upper Assam Party, surveying in Seebaugor, reports an improvement since his former inspection. He recommended that Mr. Talbot's Party should be strengthened by the addition of another Sub-Assistant, "as it is not prudent to depend upon the presence of only two English Assistants in a climate like Assam." I should ordinarily have backed this recommendation for the favorable consideration of Government, but the present financial pressure points to the urgent necessity for a decrease, rather than an increase to present establishments.

10. Under the demands for lessening the present expenditure, I propose absorbing Mr. Talbot's party at the close of this field season, in those of the 1st and 2nd Divisions employed respectively in the Luckimpore and Kamroop Districts subject to the approval of His Honor the Lieutenant Governor, and of your Board.

11. The third and last Survey Party in Assam, which was inspected by the Officiating Deputy Surveyor General, was employed in Kamroop under the orders of Captain Butter: Major Macdonald, was dissatisfied with what he saw, and having left on record on his departure for short leave to Europe, some stringent remarks bearing on the general conduct of the survey, the Executive Officer was furnished with a copy, and cautioned. To this day the records and maps of season 1867-68 of the 1st Division have not been submitted to this Office, the reason assigned being, that the 4-inch maps, which require the countersignature of the Deputy Commissioner of the District, in order to legalize the boundaries under the new rules, had not been obtained. The Deputy Commissioner of Kamroop, on the other hand, and in reply to a communication from this Office, explained, "that as the surveys included considerable quantities of Lakhiraj lands, in excess of what the proprietors had any real claim + he was unable to sign them as correctly shewing the holdings of each La' rajdar." This subject was immediately reported, and brought by me to the notice of your Board, and will no doubt receive the attention which its importance deserves.

12. The 4th Division was twice visited and inspected by myself; it is commanded by Captain Stewart, who labors under the disadvantage of not having his establishment massed in a single district, instead of being employed in desultory work partly in the Ganges Dearah Survey, and in the re-survey of the Government Estate of PUNCHANNORAM. This necessarily prevents that close supervision by the Deputy Superintendent, which Survey Establishments so much require, I shall therefore be glad, when the PUNCHANNORAM survey is completed, and Captain Stewart, by moving out to Camp, is able to give his undivided attention to the Mouzahwar re-survey of the Hooghly District. I trust steps may be taken during the present season, and before the Professional Survey is withdrawn from PUNCHANNORAM, to demarcate in some permanent manner, that portion of the Salt Lake boundary, which is referred to in paras. 41, & 42 of my General Report.

13. The only Party not inspected during the season, is the 5th Division in COOCH-BEHAR, under Mr. O'DONEL, an officer of considerable experience, who works systematically and well; but I found it impracticable to inspect both this, and the 6th Division, and be back in Calcutta in time, by the 1st September to enable the Superintendent of the Upper Circle to proceed on his tour of inspection. As Mr. O'DONEL'S establishment is well trained and efficient, I propose, on completion of the COOCH-BEHAR District, to move him and his establishment up to Assam, to relieve Captain Butler's party, which being the least efficient in the Lower Provinces, should, I suggest, be the first to be broken up; those members only being retained and drafted into the other Establishments who are deserving of it. This I believe is in accordance with the instructions conveyed in your Board's letter No. 4147 A, dated 8th October last, suggesting that the COOCH-BEHAR Survey party or one other of the existing establishments be broken up, as soon as the COOCH-BEHAR work is completed.

14. The 6th Division, which is engaged in making a Topographical Survey of the Hazareebaugh District, is kept under excellent control by the Deputy Superintendent, Captain SCONCE, who being a hard working Officer himself, has instilled rigid notions into the minds of his subordinates, which have resulted in first class work being furnished. The re-survey of the District of Hazareebaugh, I have every reason to believe, will be completed in the field season of 1870-71.

15. An improvement is taking place every year in the style of rendering maps, which are so prepared as to be easily susceptible of reproduction by Photozincography. I hope in another season, to be able to lessen the office work of the executive officers, by dispensing with the preparation of the 1-inch maps, which can be produced more correctly by reduction from the 4-inch maps, by Photozincography, than the present system of reducing by the pantograph.

16. I beg to enclose a letter, with statement, detailing the work performed at Boundary Commissioner's Office. The establishment generally have done well, especially the Head Writer and Head Draftsman.

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17. I continue to receive the fullest support from the Assistants in this office, *viz.*, from Messrs. J. P. Adels, A. C. Cunningham and Gopal Chunder Laha of the Correspondence and Accounts Branch, and from Mr. F. W. Kelly of the Drawing and Computing Branch. They are steady, excellent men and very attentive to their duties.

18. A List of the Revenue Survey maps which have been published during the year, is appended. A list of all maps issued from the Surveyor General's Office, is published monthly in the *Gazette of India*.

19. Major J. Macdonald, who conducted the duties of my office during my absence on furlough, was placed at the disposal of the Government of Bengal for special duty on the Cachar frontier, where he is now employed, under the orders marginally quoted. *

* Home Department Notification No. 420, dated 9th December 1909.

I have the honor to be,

SIR,

Your most obedient Servant,

D. C. VANRENEN, LIEUT.-COL., R. A.,

Supdt. of Revenue Surveys, Lower Circle.

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A.

General Return of Professional work for Season 1868-69 exhibiting area and cost of the Bengal Surveys.

Survey Division.	District in which employed.	No. of Village or Waste Land Blocks.	Square miles.	Expenditure.		REMARKS.
				Rs.	As. P.	
1st Division	Kamrup	378	800 a	56,468	9 9	a.—Includes 19 square miles of overlap on the Khasia Hills.
2nd Division	Luckimpore	84	826	63,419	3 1	
4th Division	River Ganges	561	461	23,621	9 7	
	Punchannagram	306 contg. 6,983 holdings.	11	25,819	5 4	
5th Division	Contonments, &c.	.....	80	4,808	0 0	
	Goalpara	63	420 b	22,037	4 8	b.—Includes 80 square miles of overlap on the Dhootan Hills.
	Cooch-Behar	630	603	35,036	3 5	
6th Division	Lohardugga	124	203 c	15,187	11 7	c.—Includes 1,075 square miles of overlap on Districts Gya and Mirzapore
	Hazarebogh (Topographical)	.....	1,344 d	32,365	3 0	d.—Includes an overlap of 189 square miles on Districts Gya and Monghyr.
UPPER ASSAM	Seohangor	44	250	21,439	10 0	
Total		2,101	4,953	3,07,102	12 5	
Mekhalwarv charges		.....	.....	1,090	0 0	
Grand Total for 1868-69		.....	4,953	3,09,092	13 5	

SUPDT. OF REVENUE SURVEYS' OFFICE, }
Calcutta, 12th January 1870.

D. C. VANRENIEN, LIEUT.-COL., R. A.,
Supdt. of Revenue Surveys,
Lower Circle.

B.
Districts completed in the Lower Provinces.
 1868-69.

DISTRICTS.	Commenced.	Finished.	By whom surveyed.	AREA IS.		Cost inclusive of Contingent expenses.	Rate per Square Mile.	REMARKS.
				Acres.	Square Miles.			
Dumraon ...	Season, 1865-66. ...	Season, 1868-69. ...	R. B. Smart, Esquire { Captain A. D. Hunter	23,23,786	3,571	Rupess. 2,14,638	Rs. A. P. 89 1 4	The East Doors have been transferred to District Goalpara, the area of which now stands at 4,442 Square miles, viz:— Total Area of Goalpara = 2,863 Square miles. East Doors = 1,679 " " Total Area 4,442 " "
East Doors of District Goalpara) ...	1867-68. ...	1868-69. ...	J. H. O'Donel, Esquire	10,10,251	1,679	61,759	81 13 9	
Sub-Division Palamow, District Loehardaga ...	1863-64. ...	1868-69. ...	{ Major G. H. Thompson { Captain J. Scouse	27,30,091	4,270	2,57,735	80 5 3	

SUPDT. OF REVENUE SURVEYS' OFFICE, }
 Calcutta, 12th January 1870. }
 D. C. VANBENEN, LIEUT.-COL., R. A.,
 Supdt. of Revenue Surveys,
 Lower Circle.

List of Revenue Survey Maps of the Lower Provinces, published.

SCALE 1 MILE TO 1 INCH.

From 1st December 1868 to 31st March 1869.

Sylhet Sheets, Nos. 6 and 8.

Noacolly District, Survey Circuit No. 2.

Cachar Ditto, ditto ditto Nos. 3, 4 and 5, 6, 7 and 8, 9 and 12, 10, 11.

Kamroop Ditto, ditto ditto Nos. 5, 6 and 8, 9.

Goalpara Ditto, ditto ditto Nos. 1, 2, 3, 4 and 5.

West Dooars Ditto, ditto ditto No. 7.

Reconnaissance of South Cachar Hills.

Patna District Sheets Nos. 1, 2, 3, 4, 5, 6.

Behar District Sheets No. 9 (Anastatised.)

MAY 1869.

Ganges River Survey, Main Circuit No. 7.

SCALE 4 MILES TO THE INCH.

JULY 1869.

Tipperah and Noacolly District including Hill Tipperah in 4 Sections.

SCALE 1 MILE TO 1 INCH.

AUGUST 1869.

District Cachar Survey Circuit Sheet Nos. 1 and 2.

Gogra River (between Bengal and North-West Provinces) Survey Circuit Sheet Nos. 1, 2 and 3.

Ganges River Survey Circuit Sheet Nos. 1 and 2, 5 and 6.

Ganges and Gogra River Survey Circuit Sheet Nos. 3, 4 and 5.

Sylhet Sheet No. 5.

SEPTEMBER 1869.

District Noacolly, Survey Circuit, No. 1.

Ganges River, Survey Circuit, Nos. 26 and 27.

SUPDT. OF REVENUE SURVEYS' OFFICE, }
Calcutta, 12th January 1870.

D. C. VANRENEN, LIEUT.-COL., R. A.,
Superintendent of Revenue Surveys,
Lower Circle.

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GENERAL REPORT

ON THE

REVENUE SURVEY OPERATIONS OF THE LOWER PROVINCES

FOR

SEASON 1868-69.

FIRST DIVISION,

LOWER PROVINCES,

ASSAM.

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AREA SURVEYED.—The area allotted for survey constituted the remainder of District Kamroop in Assam, comprising 799·57 square miles, including 18 square miles surveyed as an overlap on the Khasia Hills, south of the District, to interlace the work with the Topographical Survey of the Hills.

Captain A. D. Butler, S. C., Officiating Deputy Superintendent of Survey, 3rd Grade, in charge.

ASSISTANTS.

Mr. W. Sinclair,—Surveyor, 3rd Grade, transferred from 2nd Division, Lower Provinces, from 1st February 1869.

Mr. C. Brownfield,—Surveyor, 3rd Grade.

“ L. C. Hill, Assistant Surveyor, 2nd Grade.

“ R. D. Smart, Jr., Assistant &c., Surveyor, 3rd Grade.

Mr. J. O’Toole, Probationary Surveyor, 4th Grade (appointed 10th September 1865,) joined 6th November 1869.

Thirteen Sub-Surveyors, &c., (for Professional Survey.)

Thirteen Ameons (for Civil Demarcation.)

2. NUMBER OF ESTATES.—The area includes 376 villages, 39 grants, and 664 Khats and Lakhiraj estates, of which last, however, 233 still remained for survey on the 1st October 1869, “it having been found impossible to discover where they lay, or to secure the presence

of the Lakhirajdars when they were wanted.”

3. In explanation of this small outturn of 799·57, square miles the Deputy Superintendent adduces the following reasons :—first, the Sub-Surveyors were few and sickly during the greater part of the year; second, they had to deal with a considerable portion of hilly ground to which they were unaccustomed, and the minute survey of which took them a long time; third, the boundaries of some grants, lying among jungle and hills, were contested, and had to be surveyed over and over again; fourth, the infinite trouble experienced in surveying Lakhiraj lands, which will be noticed in detail hereafter.

4. NATURE AND SCALE OF SURVEY.—The scale for the Tea grants and Lakhiraj estates was 8 inches=1 mile, the villages having been surveyed on the usual scale of 4 inches=1 mile. The interior Survey was executed with Plane Table; 31 linear miles of Check Survey were run through the Circuits by two European Assistants, the comparison being pronounced by the Deputy Superintendent as very fair.

5. FRONTIER BOUNDARY.—The southern boundary of Kamroop abuts on the Khasia Hills, which were under Topographical Survey by Major Godwin Austen’s party during the progress of Revenue Survey Operations in Kamroop. As will be seen from the Deputy Superintendent’s statement, the work of the tow surveys has been completely interlaced except at a point south of Dooar Choygaon, which will be taken up by the Topographical

party this cold weather. "It had been decided by the Bengal Government that the boundary between the Khasia Hills Deputy Commissionership and Kamroop could be better laid down after the survey of the latter had been completed, the Revenue Survey accordingly, as a rule, only carried their operations down to the foot of the slope of the hills, while the Topographical Party at work in the Khasia Hills under Major Godwin Austen, surveyed up to the same point. The Officers in charge being in constant communication on the subject, there are no gaps between the surveys," except the small gap in Doar Choygaon alluded to above.

6. MINOR TRIANGULATION.—Minor triangulation was thrown over the hilly portion of South-Eastern Kamroop, 106 hill tops were cleared, and 21 platforms built for stations. Some of the hills are covered with heavy forest and bamboo jungle. Most of the Tea grants lie in this difficult ground, much of which had therefore to be surveyed on the scale of 8 inches=1 mile, the nullahs being traced up in the midst of jungle. "The boundaries were contested inch by inch."

7. CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.—The work of the season was thoroughly checked by the network of principal triangles of the Assam Longitudinal and Assam Valley Triangulation of the Great Trigonometrical Survey, with which a very satisfactory connection has been effected, as shown by the following comparative statement of values :—

Great Trigonometrical Survey Tower Stations.	DISTANCE IN FEET.		Difference.	Difference per mile.
	By G. T. Survey.	By Revenue Survey.		
Nagarbera to Sonora	54,486.87	54,422.28	64.59	— 0.27
„ to Duramari	74,349.00	74,343.72	5.28	— 0.39
Sonora to Duramari	70,990.13	70,979.04	11.09	— 0.82
Akchalia to Sonora	67,538.62	67,618.98	30.36	+ 2.37
Duramari to Hatimora	82,128.15	82,156.14	27.99	+ 1.80
Akchalia to „	75,000.81	75,022.20	21.39	+ 1.51
Hatimora to Harogaon	87,449.42	87,509.40	59.98	+ 3.56
Kurwa to Mairangka	48,854.52	48,865.08	10.56	+ 1.14
„ to Parohopa	40,654.02	40,681.74	27.72	+ 3.60
Parohopa to Mairangka	39,473.38	38,470.74	2.64	— 0.36
„ to Dumria	71,353.92	71,355.24	1.32	+ 0.09
Mairangka to „	84,026.58	84,003.48	23.10	— 1.45
Myang to Hatimora	62,662.70	62,692.74	30.04	+ 2.53
„ to Cela	46,387.50	46,361.57	5.93	— 0.67
„ to Kurwa	79,229.30	79,270.09	40.79	+ 2.72
Average where the Do. „ „	error is + „ „ —	..... .....	..... .....	2.15 1.61

8. SICKNESS.—The Deputy Superintendent remarks that the last has been the sickliest season known by the Survey in Kamroop. One Sub-Surveyor died, four were invalided, half the Sub-Surveyors were down with fever at a time, and all were ill in turn. The entire European Establishment suffered from fever, and a young Surveyor, Mr. O'Toole, lately appointed to the party, has been dangerously ill.

9. PERSONNEL.—The Deputy Superintendent records his thanks to the Revenue and Assistant Surveyors “for their zealous and cheerful co-operation during a harassing and sickly season.”

10. BAZIAFT, AND LAKHIRAJ ESTATES.—The complications and difficulties, the consequent loss of valuable time in the field, and the detention of the records of the past two seasons by the Surveyor, which have resulted chiefly from the bewildering entanglement of Lakhiraj lands with Baziaft or Government lands, are best told in Captain Butter’s own words :—

“The area surveyed this year was all performed on the system prescribed for Surveys in Assam. The Deputy Commissioner furnishes a list of all Mouzahs, Khats, Grants, and similar Revenue Divisions to be surveyed; the Surveyor maps the boundaries pointed out by the proprietors, and consented to on the part of Government by the Mouzahdar; in cases where the proprietor and Mouzahdar disagree, the Deputy Commissioner is furnished with a plan of the disputed land, and decides the case. The proprietor then signs the plan and the Mouzahdar also; the Officer in charge certifies on the Atlas that these signatures have been obtained; the Deputy Commissioner then countersigns the Atlas as correct, as regards boundaries. This admirable system has not altogether succeeded in the past season’s work, for the simple reason that the very first proviso has never complied with. The Deputy Commissioner was unable to give us a correct list of the estates for survey. The information required for such a list had “to be gathered from many different sources; and the list is not complete to this day. As regards grants, with one or two notable exceptions, we have not had much trouble, but the Lakhiraj lands entailed endless references and loss of time. Except with regard to them, the new system has worked perfectly smoothly. I take this opportunity of saying that both Major Sherer and Major Comber, Deputy Commissioners of Kamroop, at different times during the season, have given me their cordial assistance; I am glad to report that we have always worked in perfect harmony with the district authorities. It is in no way due to them that the whole question of Lakhiraj lands in Kamroop is in such confusion. I have addressed Colonel Agnew, the Officiating Commissioner of Assam, on this subject, and he intends, I believe, to take steps to have this rectified, meanwhile, the Native Surveyors have during the past season been working with imperfect lists of the estates they have to survey, and the process has been usually somewhat in this wise :—To start with, the Mouzahdar, having much more land to attend to than the Lumberdar of Upper India, (“Mouzah” in Assam being “Pergunnah” elsewhere) very seldom attends in person. He has to attend the Courts in Gowhatti; he has to collect revenue in such a place, or what not. But suppose the Surveyor to have secured a representative of the Mouzahdar, who knows just as much about the Mouzah as the Mouzahdar. The Surveyor reads out the name of the first Lakhiraj estate on his list. The Mouzahdar perhaps never heard of the owner. He possibly lives in another district altogether; the Mouzahdar sometimes has no idea where the Lakhiraj estate is. Then follows a reference through the Officer in charge of the Camp, and so on; and the Lakhirajdar, having been found by the Deputy Commissioner, is called upon again to send an agent to point out his boundaries. The agent is of course absent when the Surveyor goes to meet him; he is threatened, and perhaps fined, by the Officer in charge of the Camp; and eventually goes to the Native Surveyor. Then it turns out that he has nothing to tell; he has but a vague idea where the boundary goes unless it happens to be side by side with another Lakhiraj estate, when there is usually a dispute. The list in the Native Surveyor’s hand tells him nothing about the boundaries, of which no record exists at all in most cases. We possess the Thakbust Maps, however, compiled by the late demarcation establishment of Lower Assam and these profess to show all the Lakhiraj estates. Guided by the Thakbust Map, the Surveyor points out to the Lakhirajdar and Mouzahdar where the boundary is supposed to go. They probably made no objection, (of course there is sometimes a dispute,) and the estate is mapped accordingly. Then comes the erection of large mounds, which were ordered to be used as Theodolite stations; latterly, when it was found that the mounds were seldom ready before-hand, the Surveyors were directed to make their stations first, and let the mounds be built over them afterwards. Be the Surveyor ever so energetic, it is almost impossible for anybody, unless he knows what it is to deal with the Assamese, to conceive the immense waste of time which must necessarily take place while the above process is gone through. The estate so surveyed is eventually mapped and its area computed; and then comes a new difficulty. Although the Deputy Commissioner cannot tell us the boundaries, or even approximate position of a Lakhiraj estate, (it may be in many detached pieces,) he knows how much Lakhiraj land the proprietor is entitled to, and also how much Baziaft land; i. e., land belonging to Government and paying full rates, the revenue of which, however, is paid in direct by the Lakhirajdar, and not through the Mouzahdar. The Baziaft land is hopelessly entangled with the Lakhiraj land; nobody knows field for field, which is which. Lakhiraj and Baziaft and all the estate, as mapped by us (taken by us from the Thakbust, because nobody else could give us the information) is invariably in excess of all that the Lakhirajdar is entitled to. The Deputy Commissioner is therefore unable to countersign the boundaries as correct, as the rules expressly enjoin him to take care that no land, except what the Lakhirajdar is entitled to, shall be included in the plan of the estate. The Officiating Commissioner of Assam has in this dilemma consented to let the Deputy Commissioner affix his countersignature to the Atlas, a remark being entered

against each double-scale plan of Lakhiraj land, giving the true Lakhiraj area and Baziast area respectively, and also the area erroneously added in; the definition of the Lakhiraj portion on the ground to be left unsettled at present."

11. INTERIOR PARTIES DETAINED IN THE FIELD.—The Survey Camps came into Gowhatty in the course of July 1869, but several Sub-Surveyors' Parties continued in the field surveying boundaries of Lakhiraj estates, and field work was going on in one place or another, all through recess. "As we had not been quite able to finish the interior work moreover, parties had to be kept in readiness to take it up directly the water subsided a little. The Brahmapootra most unexpectedly rose again, being within two inches of its full height as late as the 2nd October, flooding the country and keeping the field parties at work much later than had been expected, causing a most unforeseen expense."

12. WORK FOR 1869-70.—This year the party enters upon the Survey of district Nowgong, in Central Assam, and the Great Trigonometrical Survey Triangulation has extended to that part of the district which will first come under survey.

13. INSPECTION BY DEPUTY SURVEYOR-GENERAL.—Major Macdonald, Officiating Deputy Surveyor General, who inspected this Division early in April 1869, expressed dissatisfaction with the general conduct of the Survey. The necessity for more active supervision in the field, and more energy in the conduct, generally, of field and office duties, has consequently been enjoined on the Executive and his Assistants, which I trust will lead to beneficial results.

SECOND DIVISION.

LOWER PROVINCES, DISTRICT LUCKIMPORE IN ASSAM.

14. PRELIMINARY ARRANGEMENTS.—During the recess of 1867-68, arrangements were

Lieutenant W. Barron, S. C. Officiating Deputy Superintendent of Survey, 3rd Grade, in charge.

ASSISTANTS.

Lieutenant E. H. Steel, B. A., Assistant Superintendent of Survey, 3rd Grade, joined on the afternoon of 31st January 1869.

Mr. G. H. Blyth, Surveyor, 3rd Grade.
Mr. W. Sinclair, Surveyor, 4th Grade, transferred to 1st Division from 1st February 1869.

Mr. W. A. Wilson, Assistant Surveyor, 2nd Grade.
" E. Lincoln, ditto 3rd Grade.
" T. F. Freeman, Probationary Surveyor, 4th Grade (appointed from 9th September 1868) joined 17th November 1869.

Mr. T. Shaw, Probationary Surveyor, 4th Grade (appointed from 21st April 1869) joined 20th May 1869.

Twenty Sub-Surveyors, Computers, &c., (for Professional Survey.)
Ten Ameens, &c. (for Civil Demarcation.

made with the General India Steam Navigation Company, to convey the native establishment attached to this party, between Koosteah and Debroogurh, at reduced rates, and passages were sanctioned by the Bengal Government in letter No. 2663, dated 21st August 1868, at these rates, free of all cost to the Survey. Ten Native Surveyors and 195 Measurers were thus conveyed. They left Koosteah on the 1st November and were landed at Debroogurh on the 26th November 1868. The delay in starting was caused by the intervention of the Doorga Poojah holidays, during which the men could not be induced to leave their homes, and November, a good month for Survey operations, was in consequence lost. Lieutenant Barron this year instructed the establishment, to assemble at Koosteah in time, to leave by the steamer of the 10th October, so as to reach Debroogurh by the 1st November, but even in this second attempt to secure their services in time for the early field season, he has been foiled, the men evading positive orders by not joining,

15. DURATION OF FIELD SEASON.—During the season under review the Survey Parties were formed and told off for field work on the 1st December 1868, half the Party returned to recess on the 15th June, and the remainder on the 30th June 1869.

16. DIVISION OF ESTABLISHMENT.—The establishment was divided into the Professional and Civil Branches, but their duties were combined as far as possible, the Civil Branch besides assisting in the professional survey work, was charged with the duty of demarcating the boundaries of grants and villages.

17. AREA PROPOSED FOR SURVEY.—The area marked out for survey, was estimated at 1,200 square miles, but for reasons to be given hereafter, it was found impracticable to carry out this programme.

The Surveyor states that this area of 1,200 square miles "contains the whole area to be surveyed Mouzahwar, on the left bank of the Brahmapootra."

	Square miles.
18. OUTTURN OF THE SEASON.—The area actually traversed contains	... 1,000
which consists of 29 villages, including 48 grant	
blocks of	556 sq. miles.
and of 7 waste land blocks of	270 "
The area surveyed in detail amounts to	826
Leaving a detail area for completion of	174

Which will be credited to next season's operations (1869-70).

19. CIRCUIT LEFT INCOMPLETE.—An attempt was made to survey another main circuit boundary in advance for 1869-70, on the Suddya Frontier, but continued rain, sickness, and the lateness of the season, combined, led to the withdrawal of the Survey Party.

20. POSITION AND LIMITS OF THE TRACT SURVEYED.—The tract surveyed is situated	
between parallels	27° 13'
	———— North Latitude.
	27° 42'
and meridians	95° 7'
	———— East Longitude.
	95° 51'

Average length 32 miles, and breadth 26 miles.

It lies North-East of the work of 1867-68, and is bounded North-West by the river Brahmapootra; South by the Naga Hills and the Dehing River; East by the Dibroo and Dehing Rivers, and the Suddya Road running North from Doomdooma Fort to the Soikhowa Ghât on the Brahmapootra River.

21. CHARACTER OF DETAIL SURVEY.—The Surveyor remarks that the mode of survey, the extent of the minuteness, portal (or check) and comparison, were the same as explained in paragraph 17 of the Report for 1867-68, which is here reproduced. "Through-out the past season the Surveyor has been careful, that the whole of the interior of villages, and grants, have been minutely surveyed, all the boundaries of cultivation and waste have been defined, and the streams have been carefully traced up. Old bunds and roads have been traced out through the jungle whenever heard of. The Surveyor and Assistants personally tested a great deal of the work of the Native Surveyors, and great pains have been taken to render the work complete and trustworthy." The detail Survey has all been done on the full scale of four inches = 1 mile.

22. PERMANENT POINTS.—The following permanent marks, intended for incorporation with the Great Tigonometrical Survey, have been connected by traverse with the season's work, viz :

1. Daohall Hill Station near Jeypore.
2. Makoom Fort on the Dehing River.
3. Pobha Masonry Pillar on the Brahmapootra River.
4. Doomdooma Fort near the Dibroo River on the Suddya Road.
5. Suddya Quarter Guard.
6. Dikrang Fort, North of the Brahmapootra River.

These fixed points along the left bank of the Brahmapootra will hereafter ensure a good connection with the right-bank.

23. PERSONNEL.—Lieutenant Barron expresses himself perfectly satisfied with the exertions and conduct of his Assistants, and specially notices Lieutenant E. H. Steel, and Mr. G. Blyth. He says “all have suffered more or less from the malarious climate. All hardships are, however, taken in a cheerful and uncomplaining spirit.” He cannot report as favorably of some of his Native Surveyors, a few of whom turned out incorrigibly lazy and useless, and had to be removed, as they set a bad example to the other Sub-Surveyors.

24. REASONS FOR NOT COMPLETING ASSIGNED AREA.—The reasons alluded to in paragraph 17, as having interfered with the completion of the area intended for Survey, are thus given by Lieutenant Barron. “The month of November was lost from the Establishment not arriving sooner, the steamer having taken about twenty-six days from Koosteah to Debroogurh. From desertions and from some of the old Surveyors taking their pensions this Division had become very weak in Native Surveyors. Transfers from other Surveys were received and new men engaged. They, however, being all new to Assam did not work at the same rate as those accustomed to the jungles. There was a good deal of sickness during the field season among both Native Surveyors and Measurers, and at one time in Camp No. 1., there was only one Native Surveyor fit for duty. Parties had to be detached for the re-survey of several grants of last year, rendered necessary by recent orders by the Board of Revenue, or by parts being relinquished by grantees. The greatest drawback, however, was the weather, the whole of the season was very unsettled, and the quantity of rain which fell in March, April and May was more than usual, out of these three months about five weeks were lost from this cause. The waters of the rivers and streams rose, and the lowlands were swamped. The parties were kept out in the field as long as there was any possibility of working and their health could stand out, but at last we had to retire without accomplishing the work laid down, and to the above numerous and unavoidable causes the shortness of area is due.”

25. SURVEY PARTY ATTACKED.—On the 13th May 1868, some men of the Abor tribe, attacked a party under Sub-Surveyor Myjechoollah, while encamped at the junction of the Brahmapootra and Dehing Rivers in Paropora. The object of the Abors was plunder, but on the Survey Party attempting to capture one of the thieves, the latter fired into them with the gun he had stolen. The tindal was killed and a lascar had his arm broken. The murderer and his accomplices have not yet been apprehended.

26. FUTURE OPERATIONS.—The programme of operations for ensuing seasons, sketched in paragraphs 17 to 21 of Lieutenant Barron’s memorandum of the 12th June 1868, (published in the Appendix) must now be considerably modified.

27. OPINION OF THE COMMISSIONER.—It is the opinion of the Commissioner of Assam,* whose views are concurred in by His Honor the Lieutenant Governor, that the Survey should be carried no further than is absolutely requisite for our Revenue Administration. The difficulties set forth by the Commissioner, refer to the wild and inhospitable character of the tract which is described as “an almost uninhabited and unknown wilderness, * * * its people, where there is any population, if not actively hostile, which in my opinion there is good reason to fear they would be, at all events entirely wanting both in inclination and ability to render assistance to the Surveyors, either in the way of labor, or of supplies.” Considering these obstacles, and the fear of complications with the frontier tribes, the Commissioner’s opinion is that “for all practical purposes nothing further is wanted than the Survey of our Revenue-paying Mouzals (villages) and the question of frontier can well be left in abeyance for a very long time to come.”

* Letter No. 217, of 20th August, 1869, to the Secretary, Bengal Government.
No. 1475 of 20th September, 1869, to the Deputy Surveyor General.

28. **VILLAGE AREA REMAINING FOR SURVEY.**—Lieutenant Barron in para. 3 of his Memorandum of the 12th June 1868, estimates the area of the Revenue-paying portion of District Luckimpore at 3,650 square miles, of this area 1,607 square miles have been completed from 1866-67 to 1868-69, leaving about 2,043 square miles still to be dealt with, viz., about 540 square miles on the left bank of the Brahmapootra, including 174 square miles unavoidably left incomplete this season on the Suddya Frontier, as stated in para. 18, the remainder lying North-West of the river Brahmapootra. This area of 2,043 square miles will occupy this Survey Division for at least the next two years, viz., 1869-70, and 1870-71.

29. The Surveyor's description of the country surveyed will be found in the Appendix.

30. With regard to the decision arrived at by Government, I take leave to express my deep regret, that advantage will not be taken of the presence of our Professional Survey Establishments in Assam, of laying down, and defining in some permanent manner, the territorial limits of the Province—and of adding to the scanty geographical information we possess regarding it, more especially of its North and North-Eastern Frontier. I very respectfully submit, that a fine opportunity will thus be lost, of improving our knowledge of the country.

FOURTH DIVISION.

LOWER PROVINCES.

31. **WORK ALLOTTED.**—The work allotted to this Division was the completion of the Ganges Dearahs Survey, and the re-survey of the Government Estate of Panchannogram, adjoining the Town of Calcutta.

Captain W. J. Stewart, S. C., Deputy Superintendent of Survey, 3rd grade.

ASSISTANTS.

Lieutenant S. H. Cowan, S. C., Assistant Superintendent of Survey, 2nd Grade.

Mr. D. H. Dillon, Assistant Surveyor, 1st grade, transferred from 6th Division, Lower Provinces, from 1st December 1868.

Mr. C. David, Assistant Surveyor, 1st grade.

Mr. H. R. Littlewood, Ditto ditto ditto.

Mr. J. N. Stoelke, Ditto ditto 2nd grade.

Mr. J. E. P. Lancke, Ditto ditto 3rd grade, transferred to 5th Division, Lower Provinces, from 1st December 1868.

Mr. C. W. Wilson, Probationary Surveyor, 4th grade.

Twenty-seven Sub-Surveyors, &c., (for Professional Survey.)

Fourteen Mohurirs, &c., (for Extra Khurrah Establishment.)

* Deputy Surveyor General's No. 22, dated 20th January 1868, to the Board of Revenue.

† Government of Bengal, No. 370, dated 31st January 1868, to Board of Revenue.

‡ Government of Bengal No. 1484 of 6th May 1868 to the Surveyor General.

32. **PUNCHANNOGRAM ESTATE.**—The Panchannogram Survey will be first dealt with, as being the more important. On the recommendation of the Deputy Surveyor General,* whose opinion was endorsed by the Board of Revenue, it was decided by the Bengal Government† that the work should be entrusted to professional agency, and as a portion of Captain Stewart's establishment became available in the cold season of 1868, that Officer was directed to arrange for the Survey of the 1st, 2nd, and 3rd Grand Divisions of the Khas Mehal. It was subsequently decided‡ that the Survey should also include the "Sahiban Bageecha" lands of the 24 Pergunnahs. The Deputy Superintendent remarks that after further discussion between the Officiating Deputy Surveyor General, the Commissioner, Presidency Division, and Mr. Heysham, Deputy Collector in charge of the Mehal, in which it transpired that the "after mutations of property were very general throughout the Mehal, and record of these mutations deficient;" considering also, "the comparative inability of the existing plans, owing to the smallness of the scale, it was decided that the Survey should embrace the *entire* Mehal."

33. **SCALE.**—The scale of the original Survey by Major Smyth is 350 feet=1 inch. The scale adopted for the re-survey is 99 feet (1½ chains)=1 inch.

34. **PRELIMINARY INSTRUCTIONS.**—The Deputy Superintendent of Survey having received his instructions from this office in October 1868, placed himself in communication with the Commissioner of the Presidency Division, and arranged that the Deputy Collector in charge of the Mehal should under the professional Survey all the assistance in his power in ascertaining boundaries and holdings, and to warn zemindars to attend early in December 1868.

Mr. Heysham, the Deputy Collector willingly undertook to do all in his power to aid the Survey, but declared his inability to obtain demarcations of boundaries, and stated that he had no legal authority (an opinion supported by the Legal Remembrancer) to summon zemindars to attend. He, however, inserted an advertisement in the *Exchange Gazette*, calling on proprietors to demarcate their boundaries, and to attend in person, and mean while placed an Ameen and two peons at the disposal of the Survey party.

35. OUTER BOUNDARY UNDEMARCATED.—As a first step, Captain Stewart directed the Assistant Surveyor in charge of the Punchaunogram Survey to proceed round the outer boundary of first division, and to report whether the conterminous holdings were demarcated. The report was that no demarcation could be found, and Captain Stewart personally satisfied himself as to the accuracy of the statement. As the boundary measurements would have been of little use without the demarcations, the Assistant was employed in making tracings of the previous Survey, obtaining lists of present proprietors, and with Mr. Heysham's assistance, endeavoring to induce them to point out their boundaries on the grand round No. I., the Survey of which, owing to the apathy and even obstruction on the part of proprietors, did not commence before 20th December. The boundary Survey of Division No. I, then quickly proceeded, and was completed by the Christmas holidays.

36. ABSENCE OF RELIABLE INFORMATION.—This preliminary Survey was personally superintended by the Deputy Superintendent, who wished to satisfy himself that his directions were fully understood, and to see how the record of property was being made by the Deputy Collector's Ameen, who accompanied the Survey. The Deputy Superintendent noticed, that the information hurriedly collected by the Ameen was very unreliable, and the proprietors in almost every case refused to attest the professional measurements, and it became evident that one Ameen "was inadequate to obtain the presence of proprietors, ascertain their tenures and register their property and attestations to the Survey."

37. NOTICES TO PROPRIETORS.—In December 1863 the Deputy Superintendent obtained the powers of a Deputy Collector, and issued notices to proprietors by name, to attend on fixed dates to point out boundaries and give particulars of their tenures for Mehalwary record. The notices were served by peons and Ameens acquainted with the residents, and were employed on the recommendation of Mr. Heysham.

38. AMEENS.—The Ameens were employed in the Khusrah details of all the lands in the Mehal that could be demarcated, viz., paddy lands and open cultivation, and worked under the immediate direction of a Peshkar, who tested their measurements, and recorded each holding in the form of a Mehalwary registry. After the Ameens had completed their measurements in the open country extending round the city, they were employed by the Deputy Superintendent of Survey in preparing work for the Sub-Surveyors within the city and suburban residences, where the details were too intricate to be dealt with by any but professional Surveyors. The Ameens, however, could not keep pace with the Surveyors, and rather impeded their progress than otherwise. They were accordingly dismissed on the 1st April 1869.

39. APATHY OF PROPRIETORS.—Regarding the notices issued by the Deputy Superintendent in his capacity as Deputy Collector, he states, "as a rule, these notices were attended to when received, but not promptly, and many refused to attend altogether, and a reference to the Legal Remembrancer, resulted in that Officer's opinion that it was illegal to impose fines or any other penalty on proprietors for not attending after being properly warned."

40. MOHURIS.—To remedy this inconvenience, twelve mohurirs were appointed on 15 Rs. per mensem each, in place of the discharged Ameens. The duty of the mohurirs was to register each man's property, to obtain the signatures of proprietors, as the Survey proceeded and generally to secure attention to the requirements of the Survey. The mohurirs rendered effective aid, and work proceeded very satisfactorily, till 1st August 1864 when the setting in

of the rains, and sickness among the field parties, put a stop to out-door work. Survey stations were carefully secured to admit of operations being resumed without delay during the ensuing season 1869-70.

41. BOUNDARY ON SALT LAKES UNDEMARCATED.—The Deputy Superintendent reports that he failed to ascertain the boundary of the Mehals adjoining the Salt Lakes, and the lands reclaimed from the salt wastes and jungle on the south-east. The Deputy Collector was unable to point out the boundary or to summon proprietors to do so. These valuable lands reclaimed within a few years have been resumed by Government, and the limits of the Mehal have been thereby extended. The definition of these limits is especially required to enable the Surveyor to prepare a sectional plan showing the boundary of the Mehal from end to end, to aid the Executive Engineer in the erection of iron boundary marks thereon. The special Ameen deputed by Mr. Heysham to ascertain the boundary, was of no use, and “it is undefined to this hour,” and is a very serious deficiency in the records of the estate.

42. The survey of PUNCHANNOGRAM on a large scale is now being proceeded with. It will be finished during the present field season. I cannot therefore too forcibly urge the necessity of rendering the operations of a costly professional Survey, complete in every respect, by having its external bounds, more especially those of the Mehals adjoining the Salt Lakes, authoritatively determined. They should be demarcated by the erection of permanent land marks of stone, or iron pillars. Unless this be done now at the time of Survey, and the limits of each Mehal indicated on our maps, endless disputes will arise, leading to complications hereafter.

43. EXTENT OF SURVEY.—The most costly and troublesome part of the PUNCHANNOGRAM Survey is now over. The estate has been divided into polygons, each including a few holdings, and mapped in sections done up to margin. More than half the detail area of the Mehal has been completed, including the most intricate portions, and the Deputy Superintendent hopes to complete the entire Mehal in December 1869. He states—“Simultaneously with Survey, a field register has been prepared, showing the names of proprietors of each holding, the number of their pottah, the nature of their tenure, whether *Khas*, *Mal*, or *Lakhiraj*, and with few exceptions, the proprietors have all attested, and accepted the Survey as correct.”

44. COMPLAINTS.—Only three complaints were raised, and in each case, after inspection of the registry, the complainants went away satisfied that their suspicions were unfounded.

45. AREA SURVEYED.—The subjoined statement shows the extent of work done in PUNCHANNOGRAM :

DIVISIONS.	Number of traverse Circuits.	Number of holdings.	AREA IN.	
			Acres.	Square miles.
Grand Division No. 1	} 103	2,864	2,944.47	4.60
„ No. 2				
„ No. 3	} 125	1,519	2,070.83	3.24
„ No. 4				
„ No. 5	} 80	2,500	2,029.35	3.17
„ No. 6				
Total	308	6,883	7,044.65	11.01

The detail areas of all these 6,883 holdings were calculated and recorded in biggabs, cottahs, gundas, and chittacks, as well as in acres, roods, poles, and square feet. To facilitate reference

to previous survey, where the original holdings have been sub-divided, "the same number is shown for each portion, supplemented with letters; thus No. 18 in Major Smyth's Survey may now be made up of 18A, 18B, 18C, and so on."

46. RAILWAY LANDS, &c.—A very complete Survey has been made of the lands occupied by the Eastern Bengal Railway and the Mutlah Company: also, of the lines of roads and canals opened out since the previous Survey. The Municipal Surveyor's bench marks have been taken up, and the most minute details have been surveyed and mapped.

47. CANTONMENTS.—The cantonment and environs of Dum-Dum were surveyed on the scale of 16 inches=1 mile, and the plan will soon be lodged in this office. In addition to this work, the plan of the city and civil station of Bhaugulpore, surveyed in 1867-68, was completed by the extension of the survey up to municipal limits, which have been defined and shown on the plan. The municipal boundary, however, could not be marked on the plan of the Berhampore cantonment and environs, surveyed in 1867-68. The Deputy Superintendent remarks that during the cold weather of 1868, "Mr. Hankey, the Magistrate and Collector, endeavored to find out through actual enquiry on the ground, the limits of the municipal boundary, and I therefore left at his disposal: very good Sub-Surveyor to survey the boundary. The result was extremely unsatisfactory, and the Surveyor was re-called to Punchannogram. The extension to the south-east of the Barrackpore Cantonment Survey was also completed by this party.

48. PUBNAH DEARAHS.—The Dearah Survey party commenced work 24 miles east of Kooshteah on the 29th November 1868, surveying the Ganges River, through districts Pubnah and Furreedpore up to Goalundo, at the confluence of the Ganges and Jumoona Rivers; thence proceeding north and taking up the Pubnah Dearahs lying between the Jumoona River on the east, and the Oorasagur River on the west. The country south of the Ganges in district Furreedpore, and east of the Jumoona in district Dacca, being undemarcated, the Survey lines were run through unaltered country, as many permanent land marks as possible being fixed for the purpose of facilitating connection with the Furreedpore District Survey, and the result is a first rate agreement between the former and present surveys. "On the Pubnah side of the Ganges the Main Circuit boundary Survey included the outer line of demarcated villages, the Assistant being directed that" if anywhere this line did not appear to have attained a distance from the river sufficient to ensure its being unaltered, to extend his measurements further inland, "but the course of the Ganges not having materially changed, it was found unnecessary to enlarge the Circuit beyond the field of demarcation.

49. AREA.—The number of village circuits surveyed=561. Total area=461.03 square miles, including the area of the Ganges, Jumoona, Oorasagur, and minor streams, with their churs and adjacent village lands and Topographical Survey of undemarcated lands lying in districts Furreedpore, Dacca, and Mymensingh.

50. DEMARICATION.—The Deputy Superintendent remarks, that in Main Circuit 30, which embraces the lands between the Jumoona and Oorasagur Rivers, "the demarcations caused a great deal of extra work. The village demarcation plans had been made during the previous rainy season, and differed so much on comparison with the Surveyor's boundaries, as to necessitate a completely fresh demarcation of all the lower lands. This materially increased the work of the Surveyors, and caused such interruption, as to preclude the possibility of bringing up areas and comparisons in the field. The outer line of village survey, however, was found to agree with the previous survey, and trijunction sites for pillars were selected accordingly. It was with difficulty that the entire area was correctly surveyed and passed with the Thakbust by 1st June 1869."

51. CHECK.—The Sub-Surveyors were inspected, and their work tested in the field by the Assistants, who also inspected the sites fixed on for permanent pillars, and saw they were properly secured.

52. **CLOSE OF FIELD SEASON.**—The Dearah Survey Camp broke up for recess in the middle of June 1869.

53. The maps, areas and comparative tables, showing the amount of accretion and decretion in each village, with remarks accounting for differences, have all been made over for the Civil Superintendent of Survey, and copies have also been furnished to the Collector.

54. **ABSTRACT.**—The total out-turn of the season is exhibited below :

			Square miles.
Punchannogram	..	..	11.01
Dearah Survey	..	..	461.03
Dum-Dum Cantonment	..	..	21.17
Bhaugulpore and Barrackpore extension			9.0
Total area	..	..	502.21

55. **COMPARISON WITH GREAT TRIGONOMETRICAL SURVEY.**—Seven Great Trigonometrical Survey stations of the Brahmapootra series have been taken up, and closed upon, but the Great Trigonometrical Survey direct distances of this series (of 1868-69) are not yet available for comparison with the Revenue Survey values.

56. **INSPECTION OF OFFICE BY THE DEPUTY SURVEYOR GENERAL.**—This office has been twice inspected since my return from furlough, in the months of August and September. I noticed a decided improvement since my last inspection of it in April 1867, more system, regularity and order, in rendering work. Some of the native surveyors, who have been promoted from Tindals, experience difficulty in preparing their board plans in accordance with present requirements, but they are very pains-taking, correct surveyors, and a very useful class to retain in the department.

57. **WORKING OF ACT IX OF 1833.**—The working of Act IX of 1833, is beset with some difficulties, which Captain Stewart appears to be unable successfully to cope with. If, as alleged, the Legal Remembrancer has given it as his opinion that under that Act, the Deputy Superintendent has no authority either to summon landholders, or to impose fines, his position is very embarrassing indeed. He should undoubtedly be armed with sufficient powers for that purpose. I venture to bring this to the notice of the Board of Revenue.

58. **PERSONNEL.**—Captain Stewart expresses himself well satisfied with his Assistants. In my inspection I was very favorably impressed with the result, more especially of Lieutenant Cowan's, and Mr. David's labours.

59. **PROGRAMME FOR 1869-70.**—During the present season, the Deputy Superintendent will be employed in completing the survey of Punchannogram, and in the re-survey of a portion of the Hooghly District.

60. **LEVELS.**—Levelling operations have likewise been sanctioned for the districts of Hooghly and Midnapore, by Government, for which a small additional establishment will be detailed. In the present field season, the series of Levels, which may be determined on, will be confined to Hooghly.

61. It having been ordered by Government that permanent bench marks, at selected tri-junctions of villages, shall be built, at the expense of the zemindars, the stations to be selected by the Professional Surveyor, no time should be lost in having them raised. This should be done prior to survey, as otherwise, additional expense will be entailed on Government, by the Surveyor having to go over the ground twice. This very useful reform of more permanently utilizing the labours of the Professional Survey in Bengal, it appears, can only be carried out by passing a law, for which a separate bill will have to be prepared. On the importance of having this done soon, I would especially invite the attention of the Board.

FIFTH DIVISION.

LOWER PROVINCES.

62. COMMENCEMENT OF FIELD WORK.—The field establishment of this party was organized at Rungpore on the 11th November 1868, one

Mr. J. H. O'Donel, Deputy Superintendent,
1st Grade.

ASSISTANTS.

Mr. J. Pickard, Surveyor, 2nd grade.
D. H. Billon, Assistant Surveyor, 1st grade, transferred to 4th Division, Lower Provinces, from 1st December 1868.

Mr. T. D. Moran, Assistant Surveyor, 2nd grade.

Mr. J. E. P. Lincke, Assistant Surveyor, 3rd grade, transferred from 4th Division, Lower Provinces, from 1st December 1868.

Mr. W. J. Lane, Assistant Surveyor, 3rd grade, transferred from 3rd Division, Lower Provinces, from 1st November 1868.

Mr. G. H. O'Donel, Assistant Surveyor, 3rd grade.

Thirty Sub-Surveyors, &c.

camp started on the 19th for the Eastern Dooars, and another on the 21st for Cooch-Bihar. Survey operations were carried on in Dooar Bijnee, which alone remained to complete the Eastern Dooars of the Goalpara District, and the Survey of the Tributary State of Cooch-Bihar was commenced and extended over nearly the western half of that State.

LIMITS OF COOCH-BEHAR.—North and west lies the district of Julpigoree; south, district of Rungpore; east, run the

Toorsa and Juldoka or Singemaree Rivers, which separate the surveyed from the unsurveyed tract.

LIMITS OF GOALPARA.—Dooar Bijnee, which completes the district, lies in the north-east corner, having Bhootan on the north, and district Kamroop of Assam on the east.

63. AREA.—The total out-turn of area in both districts, including an overlap of 50.46 miles along the Bhootan Hills north of Dooar Bijnee, amounts to 1,023.74 square miles, thus distributed :—

SQUARE MILES.

In Cooch-Bihar, 539 Traverse Circuits ...	603.31
In Goalpara 65 Traverse Circuits ...	369.97
Add area of Bhootan Hills	50.46
<hr/>	<hr/>
Total .. 604 Traverse Circuits, and	1,023.74

64. Several skeleton circuits had to be run out to connect Great Trigonometrical Survey stations: these connecting circuits enclose an area of 264 square miles, which, however, is not included in the area of the season, though it represents part of the work done by the party.

65. COST.—The total cost amounts to Rupees 57,973-8-1 and thus distributed :—

	Rs.	As.	P.
For District Goalpara	22,037	4	8
„ Cooch-Bihar State	35,936	3	5
<hr/>	<hr/>	<hr/>	<hr/>
Total Rupees	57,973	8	1

the average rate per square mile being Rupees 59-9-0, to which I would invite early attention. This would reduce the cost of the Survey, as a charge to the Government, which would then stand at Rupees 22,037-4-8. The cost of the Cooch-Bihar Survey, the Deputy Superintendent states, “still remains to be adjusted with the Cooch-Bihar State.”

66. UNIT OF MEASURE.—In November 1868, the Surveyor proceeded to meet Colonel Haughton, Commissioner, Cooch-Bihar Division, at Ruheemgunj, to arrange for the Survey of the State, and field work commenced there on 10th December. The Talook or Mouzah has been adopted as the unit of measure in Cooch-Bihar; the Jote being too small, is defined by the Khusrah or settlement, and the Talook by the Professional Survey.

* No. 5424, dated 12th November 1869, from Collaborating Secretary to the Government of Bengal, to the Commissioner of the Cooch-Bihar Division.

67. **EXTENT OF DETAIL IN COOCH-BEHAR.**—It was decided by His Honor the Lieutenant-Governor, in the letter cited in the margin, that the Cooch-Bihar Survey should show :—

1st.—Existing Jotes and Talooks.

2nd.—Rent-free tenures.

3rd.—Jungle divided into convenient blocks.

4th.—Topographical features, everything beyond this being filled in by non-professional Khusrah and Settlement parties.

TALOOKS AND JOTES.—A "Talook" as defined by the Commissioner, is an aggregation of Jotes or small holdings belonging to one person, the "Jotedars" being, next to the Rajah, proprietors of the soil.

The average size of Jotes is 16 to 20 Acres.
Ditto of Talooks 300 to 400 „

68. **DEMARICATION.**—"Masonry platforms" says the Surveyor, "were erected over a part of last seasons's work in Cooch-Bihar by the Settlement Deputy Collector, under orders, of the Commissioner of Cooch-Bihar, and maps showing tri-boundaries of villages were furnished for the Deputy Collector's guidance." The boundary marks of 22½ villages, area 190 square miles, demarcated the previous season by the Deputy Collector, were set up by his Ameens in December 1868.—315 villages, area 414 square miles were demarcated by the Surveyor, who also demarcated in advance for 1869-70, the boundaries of 290 villages, area about 200 square miles. The demarcation establishment at the disposal of the Surveyor consists of three Peshkars and thirty Ameens.

In the Goalpara District, the boundary marks of villages demarcated the previous season were set up, and the few remaining villages were demarcated by the Surveyor.

69. **THAKBUST MAPS.**—"The comparison of Thakbust Maps was in general good, the boundaries that differed were immediately examined in the field and corrected."

70. **DETAIL WORK IN GOALPARA.**—Regarding the work in Goalpara Mr. O'Donel remarks,—“The interior details have been minutely surveyed. All doubtful work has been revised. The intersections to the Bhootan frontier hills were taken by Mr. Pickard, he was assisted by a native surveyor who traced up the streams and sketched in the hills.”

71. **CHECK SURVEY.**—Check lines were run by European Assistants across the detail work, which stood the test very satisfactorily; 83½ linear miles of Check Survey were taken through Cooch-Bihar, and twenty-two through Bijnee Dooar; in all 105½ miles.

72. **BOUNDARY BETWEEN RUNGPORE AND COOCH-BEHAR**—A good connection has been effected between Cooch-Bihar, and District Rungpore, surveyed in 1858-59, many of the Survey stations in the latter having been identified and incorporated in the traverses of Cooch-Bihar. Mr. O'Donel, in reply to a reference from this office, states,—“The old Rungpore boundary in Cooch-Bihar has been copied throughout. Many of the old stations were found, they have all been taken up. The changes are trivial; in two places where the Rungpore boundary does not agree exactly with the old Thakbust Maps, the correct boundary has been taken. In one detached village, Fulnapore, Pergunnah Patgram, district Rungpore, the boundary has been changed by orders of the Special Commissioner, who decided the dispute in favor of Fulnapore. The district boundary to the east is disputed, owing to the Sunkos River having changed its course. The Collector of Rungpore and Deputy Commissioner Cooch-Bihar have both decided to adopt the old surveyed boundary. This will be looked to in 1869-70.”

73. ORIGIN OF SURVEY.—The origin of Survey for Cooch-Bihar is the Great Trigonometrical Survey Tower Station of Dhurumpore on the Teesta River, on the western extremity of the State.

74. GREAT TRIGONOMETRICAL SURVEY STATIONS AND PERMANENT POINTS.—The positions of fourteen prominent points, principally Hauts, Forts, and Police Stations have been laid down, ten in Cooch-Bihar and four in Dooar Bijnee, besides which, fourteen principal stations of the Assam Longitudinal Series have been connected with the work of the season, viz :

1. Dhurumpore	} In Cooch-Bihar.	
2. Chilahatee ...	...	..	..
3. Balapara ...	...	..	..
4. Mekligunj ..	...	..	..
5. Koochlibaree	...	..	..
6. Nendarpar ...	...	..	..
7. Jugutber ...	...	..	..
8. Barabhita ...	...	..	..
9. Golai Naohatee	...	..	..
10. Chunderpore	...	..	..
11. Jigabaree ...	...	..	..
12. Atarobanki ...	...	..	..
13. Narikola		} In Goalpara.
14. Bhoirab ...	..	...	..

75. STATE OF THE TOWERS.—“ Towers one to six have fallen down, and are now mounds. Towers seven to twelve are in a very dilapidated state, the masonry is kept together by the roots of *peepul* trees. The posts used round Jugutber are now large *semul* trees. The bricks of Barabhita Tower fall at every step one takes to go to the top. Jigabaree Tower erected on the ramparts of the old capital of Cooch-Bihar, Komatapore, has partly fallen down on the northern side, facing the outer ditch. Atarobanki Tower is barely standing. The tops and sides of Golai Naohatee and Chunderpore towers were covered with large *peepul* trees.” Such is the description given by the Surveyor.—

76. RATIO OF REVENUE SURVEY ERROR.—The following tabular statement exhibits the difference of the Revenue Survey direct distances (given by the Surveyor,) as compared with Great Trigonometrical Survey sides :—

GREAT TRIGONOMETRICAL STATIONS.	DIRECT DISTANCES IN FEET.		Error of Revenue Survey.	Error per mile in feet.
	By Great Trigonometrical Survey.	By Revenue Survey.		
Dhurumpore to Chilahatee ...	57,358.21	57,369.18	+ 10.97	1.00
Chilahatee to Mekligunj ...	51,378.92	51,348.00	- 30.92	3.16
Dhurumpore to Mekligunj ...	62,908.77	62,903.02	- 5.75	0.61
Chilahatee to Balapara ...	57,522.87	57,532.86	+ 10.00	0.97
Mekligunj to Balapara ...	49,581.70	49,581.84	+ 0.06	0.01
Balapara to Koochlibaree ...	51,375.01	51,396.18	+ 21.17	2.17
Mekligunj to Koochlibaree ...	59,720.64	59,760.30	+ 39.72	2.99
Mekligunj to Jugutber ...	57,158.67	57,159.86	+ 1.19	0.13
Koochlibaree to Nendarpar ...	47,928.19	47,923.00	- 5.19	0.24
Jugutber to Nendarpar ...	55,508.22	55,484.62	- 23.60	2.42
Koochlibaree to Golai Naohatee ...	55,361.05	55,331.10	- 29.95	3.14
Nendarpar to Golai Naohatee ...	59,716.33	59,693.70	- 22.63	1.91
Nendarpar to Jigabaree ...	55,503.74	55,498.09	- 5.66	0.53
Nendarpar to Barabhita ...	49,456.92	49,401.72	+ 4.80	0.51
Jigabaree to Barabhita ...	57,213.69	57,175.80	- 37.79	3.46
Golai Naohatee to Chunderpore ...	51,032.01	50,995.58	- 36.43	3.87
Jigabaree to Chunderpore ...	54,107.24	54,360.48	+ 253.24	3.06
Jigabaree to Atarobanki ...	58,234.99	58,227.68	- 7.31	1.23
Chunderpore to Atarobanki ...	53,355.51	53,295.68	- 59.83	5.82
Chunderpore to Atarobanki ...	58,151.90	58,132.14	- 19.65	1.77
Chunderpore to Atarobanki ...	53,789.23	53,791.98	+ 2.75	0.27
Average where the error is plus	.....	.....	.....	1.08
Average where the error is minus	.....	.....	.....	2.33

From which it will be noticed that the maximum and minimum differences per mile in feet, are respectively, 3·87 and 0·01 whilst the average error per mile is 1·91 only. This comparison which is very satisfactory, bears ample testimony to the care bestowed by the Deputy Superintendent in the conduct of his survey operations.

77. PERSONNEL.—Mr. O'Donel reports well of all his Assistants.

78. OUTBREAK OF CHOLERA.—During March, April, and May, 1869, cholera of a bad type was raging over the Cooch-Bihar Territory. Survey parties were moved from place to place, wherever there was a chance of doing work, but on the 9th May there was a serious outbreak of the disease in the Survey Head Quarters' Camp. Out of sixty persons, twenty-four were struck down, of whom ten died, and the panic became so great, that the Surveyor was obliged to break up camp and retire to Rancegunj, thence to recess quarters at Rungpore. During this period of alarm the country was fast being inundated by heavy continuous rains, but through all these difficulties the programme of the season was carried out in its integrity.

79. PROGRAMME FOR 1869-70.—The survey will this season complete Cooch-Bihar, with a reduced establishment. The remaining area is estimated at 700 square miles.

80. The Surveyor's description of the country will be found in the Appendix.

SIXTH DIVISION.
LOWER PROVINCES.

Captain J. Sconce, R. A., Deputy Superintendent of Survey, 2nd grade.

ASSISTANTS.

Lieutenant E. W. Samuels, s. o., Assistant Superintendent of Survey, 1st grade.
Mr. J. Todd, Surveyor, 4th grade.
Mr. W. H. Vyall, Surveyor, 4th grade.
Mr. G. H. Cooke, Assistant Surveyor, 2nd grade.
Mr. R. C. Ewing, Assistant Surveyor, 3rd grade, transferred from 1st Division Lower Provinces, from 1st October 1868, joined 3rd November 1868.
Mr. H. Hexter, Probationary Surveyor, 4th grade, appointed 10th October 1868.
Twenty-one Sub-Surveyors, Computers, &c.

81. WORK ASSIGNED.—The work of the season consisted in completing, *first*, the Mouzahwar or village Survey of Sub-division Palamow, district Lohardugga ; *second*, in surveying the boundaries of a belt of villages abutting on district Gya ; *third*, the commencement and prosecution of the re-survey of district Hazarebagh Topographically on the scale of one mile to an inch. The area is distributed in the following manner:—

	VILLAGES. SQUARE MILES.	
Tuppeh Ontaree of Sub-division Palamow ..	124	185·23
An overlap of 34 linear miles on the Mirzapore and Gya Districts		16·75
Main Circuit No. 10 of Palamow		201·98
Re-surveyed in district Hazarebagh, inclusive of an overlap of 188·86 square miles on Districts Gya and Monghyr		1,343·97
Total		1,545·95

82. NATURE OF WORK IN PALAMOW.—Sub-division Palamow was completed on the full scale of four inches to a mile. The Main Circuit Survey was based on triangulated points, the coordinates being referred to Kootna Hill Station of the Calcutta Longitudinal Series, the origin of survey. Regarding the detail Survey of Sub-division Palamow, the Deputy Superintendent states,—“ In open cultivated country, all details were fully and accurately mapped. In jungle tracts, the omission was ordered of streams under five chains in length, of patches of cultivation under one acre in area ; streams under fifteen chains in length were also ordered not to be fully surveyed, their sources and their junction with the parent streams alone being fixed, the course of the stream being shewn dotted.”

83. CHECK SURVEY.—The Check Survey extended over forty-two villages, or thirty-four per cent of the work in Sub-division Palamow. This is pronounced by the Surveyor to be “thoroughly reliable.” The detail parties were also frequently visited by the Assistant in charge, who tested the plane tables and corrected the hill sketching of some of the younger Surveyors.

84. DEMARCATION.—The demarcation is good, masonry platforms being built at all trijunctions of villages, the intermediate inflexions of boundary being marked by heaps of stones or earth. If these mounds had been larger, the demarcation would have been permanent and most complete.

85. MAPS.—The Thakbust maps were found to be of the same character as those of last season. The distances between pillars had been measured, but the bearings sketched by eye, the maps were consequently in most cases distorted, the exception being in the maps of the small villages in plain country, which agree fairly with the Professional Survey.

86. NORTHERN BOUNDARY.—The above remark does not apply to the Thakbust record of the common boundary of districts Gya and Marzapore with Palamow, which was re-demarcated in 1867-68 by extra Assistant Rakhal Das Holdar, specially deputed for the purpose. The maps are prepared by compass and to scale, and the “comparison with the professional Survey records is very good.”

87. BOUNDARY ON GYA.—When Main Circuits 4, 5, and 6, of Sub-Division Palamow were surveyed, in 1864-66, by Major Thompson, the boundary touching on district Gya was not surveyed, but was obtained from the records of the Gya Survey. In the survey of this boundary in 1868-69, “it was necessary,” the Deputy Superintendent states, “that the entire boundaries of villages along the common district boundary should be surveyed so as to obtain an accurate connection of the boundaries of the adjoining villages with the district boundary.” The extent of this skeleton survey amounted in area to 88.42 square miles, in length to 103 miles, the number of villages abutting on Gya being 85.

88. RE-SURVEY OF DISTRICT HAZAREEBAGH—Under orders of the Supreme Government cited in the margin, the re-survey of district Hazareebagh was conducted Topographically on the scale of one mile to an inch. The strength and cost of establishment having been arranged, the Deputy Superintendent received his instructions early in August 1868. To save valuable time, he utilised some of the old materials of the previous Survey, as far as he could do so with perfect safety. On this subject he remarks,—“The Topographical re-survey was decided on during recess without any triangulation, for plane-tabling having been done during the previous season, and I was led to consider how far, the original triangulation done by Major Thompson, for the check of the Revenue Survey traverses, could be made available, for plane-tabling so that the Topographers might take up their work without delay at the commencement of the season. In the Revenue Survey Triangulation the angles had been observed to minutes only, but the comparison with the Great Trigonometrical Survey rays was good, and the work appeared to be sufficiently accurate for Topographical plane-tabling. I determined, however, to adopt the old triangulation data, only for the field work of the past season. It was evident, that the triangulation of the district must be reconstructed, and the observations taken with greater accuracy. There was another subject for consideration, which would tend to expedite the work of the past season (1868-69). In examining the records of the first survey, it appeared that the failure had been in the delineation of the Topographical details, and that the skeleton work of Main Circuit and village traverses in plain country was sufficiently accurate and reliable. This skeleton Survey could then be made available for a re-survey to the extent that the marks originally laid down were now to be recognised, and as permanent village trijunction platforms had been built, in that portion of the district to be brought under Survey)

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there was at command, where the survey had been Mouzahwar, a plot of the trijunctions to be used as points of departure for laying down the Topographical details * * *. To have this skeleton survey available, during our first season's operations, was especially valuable as the native surveyors had not been trained to work by interpolations from triangulation points, and as a large portion of the district proposed for survey was flat, where to work by interpolations only would not have been possible."

89. HAZAREEBAGH ONE INCH MAPS.—The entire district of Hazareebagh will be mapped eventually in 21 standard sheets, on the scale of 1 mile=1 inch, measuring 30° Longitude by 15° Latitude. Main Circuits 8 and 9, re-surveyed in 1864-65, will be incorporated in these standards. The area under review is included in five sheets, three of which have been completed in the office of the Deputy Superintendent; the remaining two, partly filled up by the Executive, will be completed for publication at the Head Quarters' Office, by insertion of Main Circuit No. 8.

90. PORTION SURVEYED.—The re-survey of Hazareebagh, commenced at the north-east of the district, as being most convenient for two reasons, first because the tract is contiguous to the already re-surveyed Main Circuits 8 and 9, next because the village work, which it was intended to utilize, lay in that part of the district.

91. POSITION.—The tract lies north of the trunk road, north of parallel 24° 15' and east of meridian 85° 30'.

92. GREAT TRIGONOMETRICAL SURVEY CONNECTION AND MINOR TRIANGULATION.—The revised triangulation of 1868-69, with that in advance for 1869-70, covers an area of 3,900 square miles. The triangulation is based on eight stations* of the Great Trigonometrical Survey, and two rays of the Calcutta Longitudinal Series, viz., Bamini to Ghoringi on the north, and Parasnath to Cheinpur on the south, have been made use of as independent bases, for the work of the season. The value of the side between secondary hill stations Kootma and Purtkola deduced from the two bases referred to, shows difference of only 2·4 feet or 0·2 feet per mile.

93. HEIGHTS.—The heights of six secondary and thirty-eight tertiary stations were determined by double observations, and by deductions from two stations, the average difference between two deductions being 2·4 and 2·7 feet, respectively, for the secondary and tertiary points. The average number of heights is one for every twenty-six square miles of area mapped in the Hazareebaugh District, exclusive of the overlap on adjoining districts.

94. DETAIL SURVEY.—The proportion of interior survey done by European and Native Surveyors is shown below :—

	SQUARE MILES.	
By European Assistants	757·81
By Native Surveyors..	586·16
		1,343·97

95. СПЕК.—The average number of plane table stations per square mile is 10·2. The Deputy Superintendent reports, that he personally examined, and tested in the field, the boards of all the native surveyors, and their work was also checked by chain measurements.

96. PERSONNEL.—The Deputy Superintendent expresses himself well satisfied with the work and conduct of his Assistants during field and recess. He states, that on inspecting Mr. Ewing's plane-table, he found his interpolations good, and the Survey of all plain features

accurate, but his hill sketching was faulty, and he was consequently directed to revise the whole of the hill portion. "As finally turned out, Mr. Ewing's board is very creditable to him." Mr. Hexter's hill sketching had also to be revised, but his board as finally tested is reported accurate; with a little more experience this young Assistant will do well. Mr. Vyall is specially mentioned as having exercised excellent control over the detached party entrusted to him, for the survey of Palamow. The work turned out by him is reported to be most satisfactory.

97. **INSPECTION.**—In August last, I proceeded to Hazareebagh to inspect this Survey Party, the details both of field and office work were examined, and minute enquiries instituted, with a view of placing this establishment on a more appropriate footing for the Topographical Survey, on which it will be employed for two more years. The establishment has been recently strengthened in European agency, by the addition of two Assistants. As the survey remaining to be accomplished, in the Hazareebagh District, is, on the 1-inch scale, and Topographical only, Captain Sconce will be in a position to increase his yearly out-turn, without interfering with the quality of the work. The result of my inspection satisfied me, that great care has been bestowed by Captain Sconce in the conduct of his Survey, which has been close and searching. The establishment under ^{cap}able superintendence is both efficient, and in good working order.

98. **PROGRAMME FOR 1869-70.**—The Topographical Re-survey of district Hazareebagh will be continued in season 1869-70.

UPPER ASSAM, REVENUE AND TOPOGRAPHICAL SURVEY.

Mr. H. B. Talbot, Assistant Superintendent of Survey, 3rd Grade, in charge.

ASSISTANTS.

Mr. J. D. Lynch, Assistant Surveyor, 2nd Grade.
Nine Sub-Surveyors, &c. (for professional Survey.)
Five Ameens (for Civil Demarcation.)

99. **LIMITS OF SURVEY.**—The party this year finished the south-eastern portion of district Seesaugor, bounded north by district Luckimpore; north-west by the Seesaugor Survey of 1867-68; and south by the Naga Hills.

100. **CLEARING OF SURVEY LINES.**—Line clearing parties under two Sub-Surveyors were sent out in November 1868; the Officer in charge with his Assistant took the field in December, and the survey of the Main Circuits was commenced early in January 1869. Though the line cutters had a start of more than two months, yet the jungle was so dense that very little progress was made, and the survey of the Circuits was not completed till late in the season; 50 to 60 men were employed daily in each of the two Main Circuits, and some idea may be formed of the obstruction offered by the dense forest, from the fact, that it took fifty men per day for nearly a month and a half, to clear five miles along the Naga Hills frontier, from the Suffrai to the Towcock River, "the forest being of the toughest wood to be found in Assam called *nahore* and *ajar*, and many measuring from 8 to 10 feet in circumference.

101. **CAUSE OF SMALL OUT-TURN.**—The rains set in on 23rd January 1869, and continued uninterruptedly till May, when there was a break of two or three weeks only, before the close of the field season. This heavy rain-fall, combined with the difficulty of procuring coolies and keeping them supplied with food, besides the sickness which prevailed among the Sub-Surveyors and Measurers, all tended to the small out-turn of the season which contrasts so unfavorably with that of 1867-68.

102. **DEATH OF A SUB-SURVEYOR.**—One of the Sub-Surveyors deputed to supervise the line cutting, died of fever, and his loss was much felt, as he was one of the only two boundary Surveyors in the party.

103. AREA.—The area surveyed consisted of three Mouzahs, which, in Assam are equivalent to pergunnahs, containing 24 Traverse blocks and 20 Grants, covering 256 square miles.

104. DETAIL SURVEY.—The Assistant Superintendent states, that the detail survey has been minutely and carefully done, on the full scale of 4 inches to the mile, and checked in the field by him and his Assistant. He adds, however, that “it was found impossible to sketch in the hills which fell within the Main Circuits, excepting those portions which had been cleared by the planters. I tried to carry out the water courses, in hopes that I might get some idea how the ridges and spurs ran, but the forest was so heavy that I was unable to do so without spending a great deal of money, which I had not to spare.”

105. DEMARCATION.—The Assistant Superintendent reports, that he tried to survey the boundaries as shown on the Thakbust Maps, prepared by the late Civil Demarcation establishment, but had to abandon the attempt, as a good number of the boundaries of Grants had to be altered, owing to grantees having relinquished portions of their Grants. All the trijunctions of Grants have been secured with posts and earthen mounds, and the trijunctions of Mouzahs have also been secured by the professional Survey, but in future, in accordance with paragraph 13 of the Assam Survey Rules, the Assistant Superintendent will leave temporary marks at the trijunctions of Mouzahs, to be secured by the Deputy Commissioner of the district.

106. LAKHIRAJ LANDS.—There were no Lakhiraj lands in the area surveyed in 1868-69.

107. PERSONNEL.—The Assistant Superintendent reports well of his Assistant Mr. Lynch, as also of his Sub-Surveyors, who are all said to have worked well.

108. PERMANENT MARKS.—In compliance with instructions issued from this office, masonry pillars have been built by the Assistant Superintendent, along the left bank of the river Brahmapootra, as well as at convenient points within district Seesaugor, for future connection by the Great Trigonometrical Survey. In all, nine masonry pillars have been built, and of these, four are at intervals along the left or south bank of the Brahmapootra, for connection with the survey of the opposite bank, which was not taken up with the Seesaugor Circuits, owing to the great width of the river, eight to ten miles, and the large island of Majolee which lies between districts Seesaugor and Luckimpore, extending from the Dehing Mookh to Golaghat, covering an area of about 300 square miles, and which with the right bank of the Brahmapootra, will be almost a season's work in itself.

109. PROGRAMME FOR 1869-70.—The area to be surveyed in 1869-70, consists of a tract bounded on the north, by the Brahmapootra River; south, by the Naga Hills; east, by the surveyed area; west, by the Dhunsiree River; which forms the western boundary of district Seesaugor. This portion comprises an estimated area of 450 square miles, and will complete the district south of the Brahmapootra River, leaving the River and the island of Majolee to be dealt with hereafter.

110. INSPECTION.—This party was inspected in March 1869, by Major John Macdonald, Officiating Deputy Surveyor General, who reports a general improvement in the conduct of the Survey.

111. Extracts from the Surveyor's Narrative will be found in the Appendix.

SUPDT. OF REVE. SURVEYS' OFFICE; }
LOWER CIRCLE, }
Calcutta, 12th January 1870. }

D. C. VANRENEN, *Lieut.-Colonel, R. A.,*
Superintendent of Revenue Surveys, Lower Circle.

APPENDICES.

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Memorandum, by Lieutenant W. BARRON, Officiating Deputy Superintendent, on the operations of the 2nd Division, Lower Provinces, Revenue Survey, in the Luckimpore district of Assam, with an estimate of the probable area remaining for survey, both Mouzahwar and Topographical, the probable cost per square mile, and the number of seasons required, to finish, accompanied by sheets No. 2 and 3, North-Eastern Frontier, Bengal.

Accepting the British boundary of the Luckimpore district of Assam on the North-Eastern Frontier as running in the general direction of the line shewn by dot and stroke on sheets Nos. 2 and 3 from Borhaut on the Disang River near Jeypore to the top of the Patkoi mountains, along these, round the affluents of the Borce Dehing and Noa Dehing, thence to the Lat Thi, reaching the Brahmapootra at Tylung, thence along the Brahmapootra to Kloresongs, then along the top of the first range of hills north of Suddya, striking the Dihong where it debouches from the hills thence, continuing along the top of the first range of hills on the right bank of the Brahmapootra, till it reaches the hills opposite the Moramor Nuddee. The district Luckimpore will contain in all 11,600 square miles. It must, however, be borne in mind that this area and the area for Topographical Survey are uncertain, depending as they do, on the imaginary line given as the Luckimpore boundary.

2. Of this area, the portion surrounded by the dotted line, comprising 3,650 square miles, will be surveyed, Mouzahwar on the scale of four inches=1 mile; the remaining portion between the dotted and dot and stroke lines, amounting to 7,950 square miles, will be surveyed topographically on the scale of two inches=1 mile.

3. The areas for Mouzahwar and Topographical Survey are distributed as follows:—

	Mouzahwar Square Miles.	Topographical Square Miles.
On the right bank of the Dihong, Brahmapootra, and Lohit rivers	... 1,200	... 1,680
In the beds of the Dihong and Brahmapootra Rivers	... 300	... 50
On the left bank of the Dihong, and Brahmapootra Rivers	... 2,150	.. 6,220
Totals	... 3,650	.. 7,950

4. On the right bank of the Lohit and Brahmapootra rivers between the Moramor Nuddee and the Behalee Nuddee, lies that portion of the Luckimpore district lately made over to Durrung, this has been excluded from the present calculations.

5. Of the 2,150 square miles of Mouzahwar work on the left bank of the Brahmapootra, about 1,750 square miles will be completed by the end of the present survey season of 1868-69 leaving about 400 square miles to be taken up next season to complete the village survey on the left bank.

6. The area surveyed is composed as follows :—

Mouzah Jeypore, including seventeen grants of waste-lands, with a small portion of Khaloighogra proposed to be transferred ..	290	square miles.
Mouzah Khowang, including eleven grants ..	150	” ”
Eighty-one Mouzahs of the Muttock country, including seventy- two grants	1,130	” ”
Tract of waste land intervening between the Mouzahs ..	180	” ”
Total	1,750	

7. The area unsurveyed on the left bank consists of eight
Mouzahs, including four grants 400 square miles.

8. The Mouzahwar area on the right bank of the Brahmapootra,
consists of twenty-five Mouzahs, including sixteen grants 1,200 ” ”

9. The rate of out-turn has been as follows :—

	Square Miles.	Per Mensem.
First year, half the survey for five and half months ...	268	= 97½
Second year, <i>weak</i> survey for six months ...	513	= 85½
Third year, full survey for seven months, say ...	950	= 136

10. The cost has been—

First year, Rupees 132 per square mile.	
Second year ” 115 ” ”	
Third year ” 70 ” ”	(probably.)

11. With the survey at full strength, working say seven months clear, I think the remaining area for Mouzahwar survey, viz—

On left Bank	400
On right Bank	1,200
In Rivers	300
Total	1,900 square miles

could be completed in two years, giving about 950 square miles yearly and costing Rs. 70 a square mile. With my experience of survey in this district, I think it would be merely blinding ones-self to facts to give a probability of a larger outturn, or a less rate of cost. The portion remaining on the left bank is in very heavy tangled Jungle, the river portion will be a difficult and laborious task, I hear the Luckimpore or right bank is more open than the left, still I doubt, if, taking every contingency into consideration, the Mouzahwar area can be finished under two (2) seasons' work.

12. I come now to the Topographical part of the work on a scale of two inches=1 mile. I would propose that the following system be adopted :—All rivers, streams, roads, and foot-paths, to be traversed by theodolite and chain, as well as surveyed by the plane-table. Hill peaks to be intersected wherever possible by the theodolite, their bearings found and their co-ordinates worked out for plotting. A traversed circuit to be run round large blocks, wherever possible, on which the traverses of the interior streams and roads would join; it would also give stations for extending the traversing of streams and roads where no circuit lines could be carried. These circuit block-lines would have to be carried along the foot of the hills or along the tops, where necessary and possible. They would form the basis of the survey and check the detail

work There is a good deal of the country level. The large hills occur near the border, with the exception of the large spurs of the Patkoi range near Jeypore, and the hills near the Dupha Boom, and between it and the Brahmakoond. On the level portion, triangulation, or survey by intersection, would be utterly impossible, owing to the dense jungle with which the country is covered. In some portions of the hills this system might be found possible but the most of the work must be done with theodolite and chain, giving traverse checks on the plane-table details.

13. With the present imperfect knowledge of the country, it is impossible to say how much of it will be found level and how much hilly, but having gone up the Boree Dehing by boat as far as the point marked A. where the Noa Dehing divides into two, part running down by Beesa to join the Boree Dihing, I saw no hills of importance of the left bank of the Boree Dehing, except near Jeypore, nor any large hills close to A, I therefore judge that many of the hills, as marked on this map, will be found to be mere undulations, and that a good deal of level ground will be found between the Boree Dehing and the Patkoi hills, while north of the Noa Dehing and Suddya, large plains do exist. With regard to the right bank or Luckimpore side I am unable to hazard an opinion.

14. Taking into consideration the almost uninhabited condition of large portions of this waste tract, and the consequent impossibility of obtaining extra labor for jungle clearing, the necessity there will be of proceeding cautiously in some places, owing to the restless nature of the inhabitants, also the difficulty in procuring food for the survey parties when engaged near the border, and the extra labor entailed in surveying the hilly tracts. Bearing all these things in mind, I do not think that more than an average area of 1,600 square miles over all could be surveyed yearly. This rate, however, ought to give a good map, with very carefully surveyed topography. The cost would be about Rs. 40 per square mile.

15. This estimate of yearly out-turn for topographical work may appear small, and the cost per square mile large, but it must be taken into consideration that the rate of wages of our Native Establishment is almost doubled in Assam, and much extra expense has to be incurred in keeping up the establishment; moreover, with all the contingencies of want of labor, bad weather, and heavy jungle clearing, I do not think it would be right to put down such an estimate for area and cost, as might be found impossible to attain even under the most favorable circumstances. Besides, in this memorandum I am endeavoring as far as I can, with the experience I have already had of Assam, to estimate the probable time this Survey Division will be occupied in Luckimpore District, and what the cost of survey must be.

16. Taking the above estimate therefore, the area to be surveyed topographically, *viz* :— 7,950 square miles, will be completed in five years. This gives a total of (7) seven years more for this district, say 4½ seasons on the left bank of the Dihong and Brahmapootra, and 2½ seasons on the right Bank of the Dihong, Brahmapootra, and Lohit.

17. When I consulted Major Stewart, late Deputy Commissioner of Luckimpore, as to whether the whole of the Mouzahwar work should be finished before the Topographical work was taken in hand, he gave it as his opinion that the whole tract on the left bank of the Dihong and Brahmapootra, both Mouzahwar and Topographical, ought to be taken in hand first, and on the survey being completed as far as possible on this side, that then the Luckimpore or right bank side should be taken up. He was anxious that more should be known of the country, and the tribes lying to the north and east on this part of the Frontier. This Programme is also most suitable for the survey making the work more continuous from year to year, and allowing better arrangements to be made for its successful prosecution. I would recommend that this plan be adopted.

18. The arrangements for next season will then be, that one camp will have its head quarters at Suddya, to finish the Mouzahwar area lying in that quarter, afterwards to take up

Topographically the country north of Suddya and to the east of the Dihong. The other camp would have its head quarters at Jeypore, and would take up Topographically the country to the east of Jeypore, between the Boree Dehing and the Patkoi Hills.

19. In subsequent seasons the first camp would work eastward by the Brahmakoond to the Noa Dehing; the second camp would work northward from the Patkoi to the Noa Dehing; their head quarters be formed on the Boree or Noa Dehing, as the work progressed. These Rivers communicating with each other, give a means of water carriage between Suddya and Jeypore.

20. It might be thought to be more convenient to have both camps closer together, but as each is complete in itself and works independently, I consider this immaterial. The only considerations likely to effect the localities of the camps will be with reference to their better protection. I think that as long as the camps can work from Suddya and Jeypore, these are the best points for their head quarters; as each camp could take up the tracts most convenient for it, unfettered by the presence of the other, and the supplies of food would be drawn from two different centres, and therefore be the more easily obtainable. Afterwards, when the work is approaching completion, the camps might be amalgamated at the point A, which is convenient of access by water from Suddya, or Jeypore. Food could be carried to this point by Suddya, up the Noa Dehing.

21. There is only one circumstance that might make it an object to take up the Mouzahwar work on the Right bank sooner than it is now proposed, and that is to complete the Survey of Grants of Waste lands in the district. On the right bank there are at present sixteen grants of Waste Land, of these, fifteen comprise an aggregate area of seventeen square miles. The sixteenth contains fifty-one square miles, but this is altogether an abnormal area and I do not think it can be sanctioned as a grant, as it is so extremely unlikely that the rules for clearing can ever be complied with. There may, therefore, be said to be about in all twenty square miles of grants, and if thought necessary a small party under a Sub-Assistant could be detached to survey them, and they could be incorporated with the Mouzahwar Survey afterwards. This would not interfere with the arrangements proposed above, which in my opinion are by far the best, and will prove most expeditious and economical in the end.

22. Having now reviewed the technical details involved in the prosecution of the survey, I venture with diffidence to offer a few remarks on the political aspect of the survey operations, as affecting the border tribes.

23. Public attention has lately been largely directed to the North-Eastern Frontier of Bengal and, it would seem inevitable that the Luckimpore district, will be chosen as the basis of any future operations, undertaken for opening out communications with the Western China Provinces. In fact, I believe that Mr. Cooper the explorer, is at the present moment at Debrooghur making arrangements for a trip through the border country into China or North Burmah, should he be successful in the object of his expedition, there is no doubt that the aspect of affairs on the Luckimpore Frontier will rapidly change, and the spirit of enterprise will not rest satisfied that large tracts of country ostensibly within the British Boundary, should remain unexplored and unsurveyed; that insignificant tribes under our rule should defy us, and endeavor to keep the country they live in, in a "terra incognita."

24. I think therefore the time has now come when it is necessary to lay down a definite boundary, and within that boundary to insist on the inhabitants living at peace with each other and respecting life and property. In some portions of the district our territory is made a scene of feuds between branches of the different tribes, the Nagas for instance, near Jeypore. Clans of the Mishmi tribes near Suddya are at enmity with each other, and some of them when they come down to Suddya or Debrooghur to trade, have to come in large parties, for mutual protection, and have to use great precautions in coming from and returning to their own

homes. Lately a band of Abors at the junction of the Brahmaputra and the Dihong on the left bank, robbed one of my Survey parties, killed one man and wounded another. They safely reached their country, and there is a great chance of the murderer escaping justice. The influence of our rule in some directions seems hardly to extend beyond our outposts; beyond these, the tribes consider themselves secure from punishment: but if the British boundary is to be any thing but a mere name, and if the border tribes within that boundary are to feel our influence and respect our laws, it is now imperative that the survey of the District be carried to the outskirts of the territory claimed by us, the boundary definitely settled, and the inhabitants made to feel that outrages will meet due punishment. The presence of the survey gives a good opportunity for laying down any boundary which shall be decided on.

25. It is not likely that another survey will be in this quarter for very many years, and I think it is almost certain that if any of the country now claimed by us is left unsurveyed, that portion will be claimed by the inhabitants thereof, and it will be the more difficult to exercise authority over it. I may instance an effect of this which I hear has been lately influencing the Naga tribes in the hills to the south of Jeypore. Our boundary ostensibly runs along the top of the Patkoi Range of Hills, but at present the surveys extend only to the foot of the hills. Beyond this, and among the hills, coal grants are sold, tea gardens are worked, and oil wells have been sunk under the sanction of Government. However, from these hills having been hitherto left unsurveyed, the Nagas have begun to look upon themselves as independent, and it is not long since two different factions were fighting among themselves for the superiority in that quarter. The Naga Rajahs, so called, sometimes visit the factories at Hookanjoorie and at Makoond and demand revenue, saying that these are their territories, and although they are generally peaceable and easily got rid of, this circumstance tends to show their feeling on the subject. It would guard against all future misapprehension, if all uncertainty is removed by the survey being extended to the top of the Patkoi, and the boundary definitely fixed.

26. The Singphoes and the Kamptis are, I believe, very friendly, and with an assurance that the survey has nothing to do with the imposition of new taxes, would, I think, either assist the survey operations or at least would not be hostile to them. The Abor Tribe is the only one likely to give trouble, but lying as they do so near to Debroogurh and Suddya, I think it would be merely confirming them in their opposition if our territory on the right bank is left unsurveyed. The frontier all round must now be definitely fixed and rendered complete, as has been done in other parts of Bengal, whence surveys have extended to the border.

27. Near Jeypore from Borhaut on the Disang to the top of the Patkoi hills, I have included in Luckimpore all the country lying on the north-east of the Disang or its apparent principal affluent. This, I think ought to be the boundary of the Luckimpore district in this quarter; all to the south-west of the Disang to belong to Sebsaugor.

28. If the survey is to be extended as far as I have indicated, it will of course be the province of the Deputy Commissioner as head of the frontier agency, to deal with the tribes in such a manner as is most likely to insure a successful result to the survey operations. He will have to decide what guards are necessary for the protection of the survey parties when engaged in the work. The chiefs will have to be conciliated and induced if possible to take an interest in the work. No steps can be taken by the survey which are not communicated to, and approved by, the Deputy Commissioner, but with mutual co-operation and cordial support, I see no reason why the whole tracts within our boundary should not be brought under survey. I am also convinced that the after results of this would be very beneficial.

29. Having now shown the extent of the country to be surveyed, the number of seasons' work, and the cost, with my reasons for recommending that the survey should be carried out to

the British boundary wherever that lies, I leave it to be decided by Government whether the whole of this tract will be brought under survey by this division, or, if not, how far it will be extended, in what directions, and under what limitations.

30. The survey will take the field again, I trust, in November, before which time I hope some decision will have been arrived at, to guide us in our future operations.

Extract from Annual Report on the operations of the 2nd Division, Lower Provinces, Revenue Survey, by LIEUTENANT W. BARRON,—Season 1868-69.

23. GENERAL DESCRIPTION OF MAIN CIRCUIT No. 5.—Main Circuit No. 5 is bounded on the north by the Suddya road and the Dibroo *Nuddee*; south by the Dehing River, and the Naga Hills; east by the Manmul *Nuddee*, Pungooree Ghur road, and Debroo River; west by the Tingrai River.

SURFACE.—The north-west portion of the Circuit is level and covered with dense forest jungle. The south east portion bordering on the Dehing is undulating, and near Jeypore there are small hills rising to 200 or 300 feet above the plains.

POPULATION.—The population is 3,000 souls.

AREA.—The area of the Circuit is 425.69 square miles.

ROADS.—The following roads lie in the Main Circuit:—1, The Seang Allie from the Tingrai *Nuddee* to the Daohall Hills near Jeypore, forming the right bank bund of the Dehing River. From Tingrai *Nuddee* to Tipling *Nuddee* this Allee forms part of the Debrooghur and Jeypore road, and is open for wheeled traffic, beyond the Tipling *Nuddee* it is in jungle. 2, From Jeypore to Makoom Fort, a Government road on the right bank of the Dehing. The Dehing is crossed by a ferry at Jeypore. This road is for the first part over hills, and is almost impassable for an elephant. The second half of it towards Makoom is level. 3, From Tingrai Tea Factory to Teensulia Thannah, parallel to, and on the left bank of the Tingrai *Nuddee*; this road communicates with several Tea Factories, but is not adapted for wheeled carriages. 4, From Jeypore northward to the Suddya road, through heavy jungle. 5, From Makoom almost due north to Dooadooma on the Debroo River, joining there the Suddya road. This road is open, but passable only by elephants. 6, From Khojooodeeh southwards towards the Singphoe Country; this road is known as the Pangooree Ghur, and is a very old road, with very high embankments. 7, From Kehang on the Tingrai eastward, through the middle of the Main Circuit joining No. 4. It communicates with different Tea Factories. 8, The Seel Ghur, a continuation of the Raj Ghur Allee, which skirts the Naga Hills on the Jeypore Mouzah, runs for some way along the top of the Tippum Hills, parallel to No. 4, and then stops. 9, The government road from Debrooghur to Suddya lies on the northern boundary of the Circuit, it is in good order, a wide road and open for wheeled traffic.

RIVERS AND STREAMS.—The rivers and streams are:—

1, The Dehing, forming the southern boundary of the Main Circuit, navigable for large boats throughout the year, and during the rains it has borne a Brahmapoetra steamer as far as Jeypore; above Jeypore the river is more rapid, and the navigation more difficult, on account of numerous "snags" which lodge in it. 2, the Tingrai *Nuddee* rises in a low tract of country towards the eastern part of the Circuit, near road No 5. For two thirds of its length, it flows in a direction almost due west, it then takes a south-westerly direction and falls into the Dehing. It is navigable for about one-third of its length for canoes in the cold weather, and for larger boats during the rains.

3, The Tipling rises in the middle of the Main Circuit, and after a south-westerly course, falls into the Dehing at Tipling Ghat near the Dehing Ferry on the Debrooghur and Jeypore road. The Digboy rises in the same low marshy tract as the Tingrai. It has a general south-westerly direction, falling into the Dehing. It is navigable for canoes for two-thirds of its length. South of the Digboy occurs the undulating tract before mentioned, in which rise the smaller streams called Thung-Thung, Jungloo, Powai, Tarakassie and the Manmul. These all run southward into the Dehing. To the north of this tract run in a northerly direction, the Deekea Jan, the Muran Jan, the Khar Jan, and the Messai Jan. They fall into the Debroo *Nuddee*. The Debroo *Nuddee* on the north boundary of the Circuit is navigable for large boats throughout its length.

GOLD.—Formerly, gold used to be washed for in the Jungloo *Nuddee*.

SALT WELLS.—Salt wells, called “poongs,” occur in the Tippum hills near Jeypore, near such wells as these, are formed elephants’ kheddahs, as the elephants are in the habit of going to lick the salt, and are thus easily entrapped.

PETROLEUM.—Near Makoom, on the left bank of the Dehing, petroleum was bored for, found and worked for some time. This enterprise has been abandoned lately.

COAL.—Coal is found on the Dehing and its affluents, and is worked to a small extent. It is brought down the Dehing to the Brahmapootra. I believe its quality stands comparison with any coal found in India.

TEA FACTORIES.—There are Tea Factories at Tingrai, Hoogreejan, Jeypore, Kehang, Chota-Tingrai, Noholia and Bazaloni.

THANNAHS.—There are two thannahs, one at Makoom, the Police force consisting of one Sub-Inspector, one Head Constable and twenty Constables; the other at Teensukia, the Police force being one Sub-Inspector, one Head Constable and six Constables.

INHABITANTS.—The principal inhabitants are of three races; Assamese, Doaneas, and Thakials. The Doaneas were formerly, I believe, the slaves of the Burmese invaders. The Thakials are, they say, pure Burmese. There are three villages of them, they keep themselves separate from the Assamese, and intermarry with each other. Their modes of worship and dressing differ from those of the Assamese; and like numerous other hill tribes, they manufacture a sort of tartan cloth.

24. **GENERAL DESCRIPTION OF MAIN CIRCUIT No. 6.**—Main Circuit No. 6 is bounded on the north by the Brahmapootra River; on the south by the Sessa *Nuddee* and the Suddya road; east by the Tingrai Allee, and the path from Ruungagora to the Pobha Guard on the Brahmapootra; west by the Rajghur Allee, the Myejan, Debroo, and Meekla *Nuddees*.

AREA—POPULATION—CASTES.—Its area is 270.25 square miles, and the number of inhabitants is 7,630. They are mostly Assamese (Ahoms and Muttucks); there are a few Kocharis, besides the imported Bengal Coolies on the tea gardens.

CULTIVATION.—The greatest amount of cultivation is in the centre of the Circuit, in mouzahs Gorpora, Digholi, Rohmorla, Hiloidari, Dingoi and Nadoa. The largest Tea cultivation lies in Titadimoroo and Konaigaon near Debrooghur. The rest of the villages and cultivation are scattered over the country lying between the Debroo and the Sessa, the largest proportion being towards the western part of the Circuit and along the Suddya and Ruungagora Roads.

WASTE TRACT.—Between the Debroo *Nuddee* and the Brahmapootra, there is nothing but a dense jungle, full of elephants, buffaloes, tigers, deer, monkeys, &c. On the Brahmapootra edge of this tract may sometimes be found the temporary huts and cultivation of a few

wandering *miris*, otherwise the tract is a jungle waste. It is traversed by several streams from the Brahmapootra to the Debroo, and in the rainy season, it is liable to be swamped when the Brahmapootra is in flood. Between the Debroo *Nuddee* and the Suddya road the country is more open than any other part of the district hitherto surveyed.

GRASS CHAPOORES.—Large tracts of high grass land, called “Chaporees,” intervene between patches of forest jungle. After the rains, when the grass is sufficiently dry, these grass lands are fired, to allow the new grass to spring up for the cattle. Then it is possible to see for some little distance across the country, but in general, the jungle in this part of Assam, both forest and grass is so heavy, that it shuts out the view of everything except the spot on which the observer stands.

ROADS.—The roads are :—1, The Suddya Road from Debrooghur, running almost due east through the Circuit. It is a good cart road and is kept in good repair.—2, The Rungagora Road from Debrooghur, running in an easterly direction, north of, and almost parallel to, the Suddya road, and at an average distance of five miles apart. It is a good road, but not adapted for wheeled carriage throughout. It is kept open, and the jungle is cut yearly.—3, The Tingrai Allee, running north and south from the Suddya road at Teensukia Thannah to the Debroo River at Rungagora. It is open for carts.—4, The Pobha Guard road, a track cut through the forest from Rungagora to the bank of the Brahmapootra, opposite the Pobha Guard.—5, The Hathi Allee, north and south from the Jeypore road to the village of Dinjoi in the middle of the Circuit.—6, The Noga Allee, from the Suddya Road northward, meeting 7, the Nadoa Allee, which joins the Rungagora Road.—8, The Rajghur Allee, on the western boundary. Neither of these last four are fit for wheeled conveyances. The Hathi Allee and the Rajghur Allee are old Assam roads, but are now broken and in jungle.

RIVERS AND STREAMS.—The *Nuddees* are :—1, The Debroo *Nuddee*, running from east to west through the Circuit, navigable for large boats its whole length, throughout the year.—2, The Sessa *Nuddee* on the southern boundary of the Circuit runs in a westerly direction. Its course is very winding, and it is navigable for small canoes, to where it is joined by the Dinjan at mouzah *Chabowra*. The smaller *Nuddees* are :—3, The Myejan, running westward into the Debroo.—4, The Dollajan.—5, Balleejan, and 6 Dinjan, running northward into the Debroo.—7, The Dinjan and Diklijan running southward into the Sessa. The Sessa *Nuddee*, and Dinjan (6) both rise in one tract of low-lying land, in the village of Bojaltoli, and during the rains they meet. During the floods the Brahmapootra runs into the Debroo through the following channels called Sootees, the Sabroojan, Sienkee Sootee, Burola Sootee, Jora Sootee, and Meckla. The whole tract bordering on the Brahmapootra is called Paropora.

TEA FACTORIES.—There are Tea Factories at Myejan, Mothola, Nagaghoolie Rohmorla, Rungagora, Bokol, Lahowal, and Dikom. Rungagora was once occupied as a cantonment; it has been abandoned, the troops having been advanced to Suddya.

MAIN CIRCUIT No. 7.—25. As Main Circuit No. 7 has not been completed, no general description of it can be given at present. It lies between the Suddya road, and the Brahmapootra. On the Brahmapootra, the jungle tract called Paropora, continues as described in last para. The part on the Suddya road is divided into mouzahs.

SURVEY PARTY ATTACKED BY ABORS.—26. There is only one incident of importance to be recorded relative to this season's work. On the 13th May some men of the Abor tribe attacked a party under Sub-Surveyor Myjeeboollah while he was encamped at the junction of the Dibong and Brahmapootra Rivers in Paropora. They stole his gun, and when his men tried to get it back from the thieves, one of them fired his own gun at them, killing the *tindal* and

breaking a *kalasses* arm, they escaped into the jungle. The civil authorities have, I believe, traced the crime to some members of the Abor tribe. Those engaged in the affair have not yet been apprehended, and such is the apparent difficulty of dealing with these frontier tribes, and especially the Abors, that I should not be surprised to hear that eventually the murderer evaded punishment.

Description of country surveyed in districts Goalpara and Cooch-Bihar,—Season 1868-69, by J. H. O' Donel, Esquire, Deputy Superintendent of Revenue Survey, 5th Division, Lower Provinces.

TRACT OF COUNTRY SURVEYED.—The tract of country surveyed, includes parts of two districts; the remaining portion of the Eastern Dooars, district Goalpara, and nearly the western half of the Cooch-Bihar District.

2. **GOALPARA PORTION.**—The portion in the Goalpara District includes Dooar Bijnee, bounded on the north by Bhootan; on the west by Dooars Cheerung, and Sidlee; on the south by pergunnah Khoontaghat; and on the east by the Monas River and its old beds, which separate it from district Kamroop of Assam. It is twenty-four miles long north and south, and fifteen miles broad from east to west, and the area is 2,36,781·64 acres, or 369·97 square miles.

3. **DOOAR BIJNEE, GENERAL APPEARANCE.**—The general appearance of the country is an extensive plain of high grass and reeds, with only a small forest of *khair* trees on the Bhootan boundary. Cultivation extends for about seven miles north of the town of Bijnee, and the intervening tract up to the frontier, is entirely uninhabited. The large belt of cultivation east of the village of Goonburgaon is intersected by numerous small streams: throughout, the cultivation is much scattered and intermixed with grass jungle. 19,630 acres are cultivated, and the remaining 2,17,152 acres are waste land. The proportion of cultivation and wasteland is as, 1 to 12. Rice and mustard seed are the principal crops. The number of inhabitants, chiefly Rajbungsees and Mech, is 9,753 or 27 to the square mile.

4. **ROADS.**—The road from Alipore to Raha Thannah in Assam, passes by the town of Bijnee. The Aie and Monas Rivers are crossed by ferries at Geroobaree and Borobilla. The old Monas River is fordable during the dry season. The road does not appear to have been repaired since it was first made in 1865.

5. **TOWNS.**—The only place of note, called a town, is Bijnee. The Rajbaree is enclosed by a brick wall in ruins, 160 yards long and 80 broad, the ditch outside is filled up. It was burnt down and plundered by Jaolia Mech, the manager of the neighboring Dooar Cheerung during the last Bhootan war, and has since been abandoned by the Rajah's family, who removed to Doomuria in Pergunnah Khoontaghat. There is a small bazar and haut. The Police station, since May last, has been removed to Salmara. A few Bhootan traders bring down for sale, India-rubber and Munjeet. Rice and mustard-seed are exchanged for salt, tobacco and other goods from Goalpara. The number of inhabitants is 200.

6. **MONAS RIVER.**—The Monas River leaves the hills near Bagdoaar Stockade, where it is 550 feet wide. As it flows a mile lower down, the bed enlarges considerably, and for fifteen miles increases to nearly two miles in breadth; there are two channels in this part of its course, much broken up into numerous small islands and sands, which unite a little above Borogaon ferry, where it is half a mile broad. Lower down for twenty-one miles, the current continues strong; it is nowhere fordable, and within Bijnee, is crossed by two ferries at Bor^{CO}ja and Borogaon ghats. It is navigable for large boats as far as Borogaon; small boats of 5 to 15 maunds proceed to Bijnee by the Doolanee *Nuddee*. It receives the waters of the Aie *Nuddee* near the village of Bhudara and numerous other small streams on both banks, and falls into the Brahmaputra near Jogeeghopa.

7. **FORESTS.**—There are no *Saul* or *Sesoo* forests in Bijnee. A block of *khair* forests containing 8,040 acres, has been marked and reserved for the Forest Department. It is situated on the Bhootan boundary, about half a mile east of Bikrum Rajah's stockade, and has Kokoloong Surra, on its north-west boundary.

8. **COOCH-BEHAR PORTION.**—The Cooch-Bihar portion includes nearly half the western side of the district. It is bounded on the north and west by the new district of Julpigoree; on the south by Rungpore; and on the east by the unsurveyed portion of the district as far as the Juldoka and Toorsa Rivers. The extreme length east and west is forty miles, and the extreme breadth north and south is thirty-six miles, and the area is 386,123·40 acres, or 603·31 square miles.

9. **GENERAL APPEARANCE OF THE COUNTRY.**—The general appearance of the country is an extensive cultivated plain which yields crops of rice, sugar-cane, jute, oil-seeds and tobacco. At intervals it is covered with numerous villages, and plantations of bamboos and other trees. Almost every village is surrounded in the cold weather, with fields of tobacco. On the western boundary the old bed of the Teesta is marked by a belt of high ground, with a sandy inferior soil, on which nothing will grow but a short stunted grass. High grass is seen in places along the churs of the Juldoka and Toorsa Rivers. The few old tanks are almost all choked with weeds. Water for domestic purposes is generally obtained from wells, which are fifteen to twenty feet deep, and cost about Rupees 2 each for digging, nearly every family has one for its own use.

10. **FORESTS.**—The forests described by Dr. Buchanan in 1809, have been entirely cleared and cultivated. No traces except village names such as Jhar Singasur, Jhar Pejoree &c., now remain. A *saul* tree is not to be seen in this part of the district.

11. **WASTE LAND.**—Towards the north-east on the boundary adjoining the Dooars there are belts of grass jungle: but with the great advantage of a quiet frontier, the border inhabitants will soon forget their former condition of anarchy, when they were constantly terrified by alarms of aggressions. There was no restraint on the gangs of armed men engaged by the temporary Bhootan managers of the Dooars. Men and women were carried off in open day, and property plundered. The men were confined and money exacted from them on pretence of debt. The women were made over as wives to their followers, or sold as slaves. With internal tranquillity restored these lands will soon be brought under cultivation.

12. **FORMER LIMITS OF COOCH-BEHAR.**—The territories of the ancestors of the Cooch-Bihar Rajah formerly included the districts of Rungpore, Julpigoree and Cooch-Bihar. About the beginning of the last century the Mogul army wrested Rungpore from his descendants. The Bhootas encroached on the north and took possession of the Dooars, now known as the sub-division of Falakata.

13. **BYKUNTPORE.**—Pergunnah Bykuntpore was settled on the descendants of Seeb-Singh, from whom the Rajahs of Cooch-Bihar were bound to choose their chief ministers called Roykotes. In 1772, Dorpo Deo the chief minister rebelled against his master and kinsman, Dherjinder Narain; by ceding the portion of his estate east of the Teesta River (Chuckla Minagoree, &c.) to the Deb Rajah, he obtained assistance and troops, and invaded Cooch-Bihar. The Rajah was taken prisoner and carried away captive into the hills.

14. **OUR CONNECTION WITH COOCH-BEHAR, 1772.**—It was during this period of trouble and distress that the Rajah of Cooch-Bihar applied for assistance to the Collector of Rungpore and offered through the Nazir Deo to pay an annual tribute of half his revenue. The proposals were agreed to, Captain Jones was ordered to proceed with four Companies of Sepoys and *a field piece*: the town of Cooch-Bihar was taken by assault. Dorpo Deo and the Bhoota army fled on all sides to the hills. In the following year, Captain Jones took the fort of Dalimkoto.

A treaty of peace was concluded with Bhootan on the 25th April 1774,—the captive Rajah was released from confinement. By the fourth article of the treaty between the British Government and Dherjinder Narain, Rajah of Cooch-Bihar, the Rajah agreed to make over one half of the annual revenue of Cooch-Bihar for ever. The amount of tribute was permanently fixed in 1780.

15. **BYKUNTPORE ANNEXED.**—After the restoration of peace, part of Bykuntpore west of the Teesta River, which had not been ceded by Dorpo Deo to Bhootan, was restored to him as an ordinary zemindaree, and a revenue of Rupees 32,000 fixed on his lands. The fact that the portion east of the Teesta River was ceded by his ancestor Dorpo Deo is now ignored by the present zemindar. The cession appears to have been only confirmed by Government, when the Teesta River was settled as the frontier boundary.

16. **CHUKLAS BODA, PATGRAM AND POORUB-BHAG.**—The three Chuklas named, were assigned to the Nazir Deo, or commander of the troops, for the payment of the army, but when the British army was bound by treaty to defend the country, the Rajah represented that the general had no pretence for keeping lands to maintain troops. The Rajah holds these estates in Rungpore as zemindar. After these changes, Cooch-Bihar was reduced to its present limits.

17. **DISTRICT JALPIGOREE.**—A new district called Julpigoree has lately been formed by adding Pergunnah Bykuntpore and Chukla Boda of Rungpore to the West Dooars. The Sub-district of Julpigoree is separated from the Sub-district of Falakata by the Juldoka River; Pergunnah Patgram is nearer to Julpigoree than to Rungpore, and is likely to be transferred to the former district. The name Julpigoree is entered on all the maps of the current season bordering on Cooch-Bihar.

18. **RIVERS.**—The principal rivers are the Teesta, Juldoka and Toorsa. All these rivers have changed their courses since the Surveys of the last century by Major Rennell. After leaving the hills they flow with strong currents in a light sandy soil, and constantly form new channels. The country is intersected with numerous old beds of rivers, in some places obliterated by cultivation, in others formed into *heels*.

19. **TEESTA RIVER.**—The Teesta flowed near the station of Dinagepore, and discharged its waters into the Ganges. In 1789 it suddenly entered one of its old beds near Ruheem-gunge, during a great storm and flood, and carried away half of both people and cattle near the new source which the river assumed. This channel passes Dimlah, and is almost dry in the cold weather. The river now flows about twenty miles east of Rungpore, and falls into the Brahmapootra near Kaleegunge. The entrance into the Teesta is dangerous, from constant shifting sands, and a very shallow channel at its mouth. Boats have to be unloaded, and goods placed in small boats, or carried by coolies for a mile. For fourteen miles the Teesta River flows through the Cooch-Bihar District. It is more than a mile broad from bank to bank, the bed is broken up into a number of islands and extensive sands, and the fair way of the stream is about 1,400 feet broad. It is nowhere fordable, and in the short distance of fourteen miles is crossed by seven ferries.

20. **JULDOKA RIVER—MANSALIE-SINGEMAREE.**—The next river to the east is the Juldoka. For seven miles east of Choorabundur it forms the boundary on Dooar Chamoorechee, ten miles lower down it receives the waters of the Doodooa *Nuddee*, and four miles further the Moojnaie *Nuddee*. The name here changes to Mansalie. Some years ago it flowed eastward to the station of Cooch-Bihar where it joined the Toorsa. The present channel takes a southern course and has forced itself across the Durlah River, near Seebpore Bowra, and further south into the Singemaree *Nuddee*, by which name it is now known in the lower part of its course, till it joins the Durlah near the village of Doorgapore. During the dry weather it is fordable as far as the mouth of the Doodooa *Nuddee*, lower down it is crossed by several ferries and admits of boats of 300 maunds in the dry weather, and of the largest size during the rains. The average breadth is 1,320 feet, or about a quarter of a mile.

21. **TOORSA RIVER.**—The Toorsa enters the district about four miles east of Falakata, the new Sub-division Station of Julpigoree. The breadth of the stream narrows from half to quarter of a mile as it flows towards Barabhita, where the entrance into the old bed, which passes the town of Cooch-Bihar is blocked up with high sand. There is high grass jungle on both banks, which are inundated during the rains. A little below Deenhutta it flows into the old bed of the Durlah, and retains this name till it falls into the Brahmapootra near Bugwah. It is fordable in some places above Barabhita, lower down it becomes deeper and is crossed by several ferries.

22. **ROADS.**—There are several roads passable for carts. The most important road is from Julpigoree to Cooch-Bihar. It enters the district near the village of Bhotbaree, and after the third mile leaves it at Chengrabanda, where it passes through Pergunnah Patgram of Rungpore. It re-enters near Balarhaut and after passing Matabhanga Police Station leads to the Station of Cooch-Bihar. The Telegraph line follows the course of this road to Cooch-Bihar, and further on to Assam *via* Dhoobree.—

The road from Julpigoree to Rungpore passes through Cooch-Bihar for five and a half miles near Kaseabaree on the western boundary.

The road from Julpigoree to Deenhutta, once the residence of the Commissioners of Cooch-Bihar, passes Mekligunge Police Station, and Setulkoochee Outpost. It enters the ruins of the old capital Komatapore at the Bagdoor gate, and after crossing the Singemaree River at Lengheechura ghat passes on to Deenhutta. The roads from Morunga haut and Choirabundur are much out of repair, the latter is cut away in many places on the banks of the Juldoka River.

23. **FERRIES.**—There are generally two canoes at each ferry, they are joined together with a bamboo-mat for crossing carts or horses, many of the canoes are old and unsafe.

24. **POLICE STATIONS** —There are two Police Stations. Mekligunge with an Outpost at Jamalda, and Matabhanga with an outpost at Setulkoochee. Mekligunge includes the whole of Main Circuit No. 1 and part of No. 2, from near Echagunge to the Doodooa *Nuddee*. Matabhanga includes the remainder of Main Circuit No. 2 and part of No. 3, except a small portion on the south-east corner which belongs to Deenhutta. There are several detached villages of Mekligunge within Matabhanga Thannah, which it will be necessary to transfer to the latter before the limits of each Thannah are finally adjusted. This adjustment is the more necessary as the revenue sub-divisions, such as pergunnahs or zillahs are entirely unknown to the present generation of inhabitants, though they appear to have existed at the time of the last settlement made by Mr. Ahmuty, Commissioner, about the year 1789.

25. **HAUTS OR MARKETS.**—There are several hauts or market places. Dewangunge, Echagunge, Morunga haut, and Seelpore-Bowrah, are the largest. Goods from the surrounding country for many miles round are brought for sale and barter. The number of people who attend these hauts may be counted by thousands.

26. **TOWNS.**—There are no large towns. Ruheemgunge derives its importance from the country west of the Teesta, being called Ruheemgunge, and from the Khas Tehsildar's Kutcherry being situated there. Dewangunge the largest market in Cooch-Bihar is close by, Lalbazar is now an old deserted mangoe tope. A small haut still remains.

Bowrah of Rungpore, situated on the borders of Cooch-Bihar, near the village of Koochlibaree, is a place of much commercial importance. Jute is the chief article of export.

27. **RUINS OF KOMATAPORE.**—The ruins of Komatapore, the old fortified capital of Cooch-Bihar, are situated on both banks of the Singemaree River. The city is surrounded on three sides by high embankments, 30 to 50 feet high, and 120 feet at the base: there was

probably a parapet on the summit of the rampart from the number of scattered bricks lying close by. The inner ditch is completely filled up, as cultivation increased; the outer ditch is 264 feet wide, and is still deep at the Bagdoor gate. From the north-west corner, another high embankment is continued four miles westward, and terminates at the village of Gurkola. On the east the city was defended by the Durlah River, now an old bed. The length east and west is eight miles, and the breadth north and south is four miles. There are two gates on the north called Hokodoor and Jaidoor, two on the west called Somsur and Bagdoor, and one on the south called Sildoar.

Near the Bagdoor gate there is a tank lined with bricks, the descent to the water is by stone steps, it is surrounded by a terrace on which there is a stone image of a *Naginee*, the upper part a woman, the lower a serpent, and an image of *Sheeb*. At Nak-katee haut a little further on along the road there are several stones lying about with carved images, one of a Hindoo chief and a female dancer, and three others with figures of females, all with noses cut.

28. SURVEY OF EAST SIDE NOT COMPLETED.—The ruins on the east side of the Singeemaree River have not been surveyed. The most striking object is a large artificial mound 500 × 400 feet at the top, lined with bricks on the eastern side, and about 40 feet high. The remains of two wells are still to be seen, and a *peepul* tree surrounded by large stones is pointed out as the Rajah's Pât or palace. Beyond the names of the gates and the images which are objects of worship, little is known of the ruins by the inhabitants. There are several villages within the ramparts, the land is all cultivated, even the enclosure called the royal residence.

29. TREASURE FOUND IN THE RUINS.—About a mile to the south of Jigabaree, Great Trigonometrical Survey Station on the northern rampart, a large hoard of ancient coins was seen falling into the river as the bank was cutting away. Rupees 13,500 were lodged in the local treasury, they have since at the suggestion of Colonel Haughton been received as bullion by Government in part payment of the annual tribute of Cooch-Behar. The coins are of interest, and contain varieties hitherto unknown. The different kinds of coin found are detailed in the proceedings of the Asiatic Society of Bengal for September 1864.

30. EDUCATION.—Education is much needed. There are forty-four Schools attended by 977 pupils, and four girls' schools with fifty-five pupils. Till very lately the exhibition of indecent images at markets was a great attraction to the people, indicating reprobate minds. Any person hearing the wonderful accounts of the building of the old capital Komatapore and its fortifications would not hesitate to pronounce them very ignorant, and capable of believing any thing grossly absurd.

31. RAJAH AND NATIVE OFFICIALS.—The present Rajah, a lad of six or seven years of age, has been placed at the Wards' Institution at Benares. The Dewan died last December, his temporary successor has since been convicted of a capital crime and sentenced to transportation for life. The Ahelkar Foujdaree, or Deputy Magistrate has been dismissed. The only European Official residing in the District is the Deputy Commissioner.

32. LAND REVENUE.—The management of the land revenue is very complicated. Major Jenkins in his report dated 25th April 1849, says,—“ This system of land management has no doubt retarded the progress of agricultural improvement in Cooch-Behar, by rendering the demands on the ryots uncertain, and in its operation must have been very prejudicial to the Rajah's finances; for the object of the complex mode in which the land taxes are imposed and levied, seems, to screen speculation and indirect gains, and to maintain a host of tax gatherers.”

All the old revenue records in the Dewan's Office were destroyed by fire in 1842, and some again in 1867.

The following table exhibits the mehals and land revenue:—

No.	Names of Mehals.	Land Revenue.
1	Izarah Mehals	2,19,175 1 3
2	Khas Ditto	84,196 3 3
3	Sairat Ditto	35,336 1 7
4	Debobur Ditto	25,860 8 2
	Total, Rupees ..	3,64,567 14 3

Nearly two thirds of the land revenue is farmed in *Izarahs* by the officers of the court, the Ranees and relatives of the Rajah. The 104 *Izarah Mehals* are not compact, but scattered in small holdings (jotes) in almost every village in the district, except the *Khas* lands under the management of the Dewan. They are let and sublet to so many persons, that it is difficult to trace them. Between the recorded landholder on the rent roll, and the actual cultivator, there are several middlemen; the *Dur Izaradar*, the *Jotedar*, the *Chukaneedar* and the *Dur Chukaneedar*. With few exceptions all are non-residents, in other districts or at the station of Cooch-Behar, having a pecuniary interest in the same lands. The exactions of so many middlemen leave the jote ryots or cultivators barely sufficient to support themselves.

33. NEW SETTLEMENT.—The settlement now in progress will greatly improve the condition of the jote ryot or cultivator. The cultivator is allowed five-tenths of the crop, three-tenths go to the jotedar or landholder, with whom the settlement is made, and the remaining two-tenths to the State. The Rajah when he comes of age, is not likely to confirm so liberal a settlement; the administration of Cooch-Behar by British Officers has proved a benefit, and will no doubt, be advantageous to the welfare of the people for the remaining fifteen years of his minority.

Extract from annual Report on the operations of the Upper Assam Revenue and Topographical Survey, by H. B. TALBOT, Esquire,—Season 1868-69.

21. The cultivation as compared with the area, is very small, but there is no doubt that both the *mouzahs in Circuit No. 10 were at one time better cultivated, as there are traces of field and village sites to be seen. The falling off of the cultivation and desertion of the villages were caused prior to the Burmese invasion by the Singpoos, a warlike tribe, to the east of Jeypore, coming annually down from the hills and pillaging all the villages and carrying away whatever they could find. And as the Assamese Government could render the villagers no protection, they were obliged to seek the protection of the Naga Chiefs, for which they agreed to give the Nagas land in the plains, called "Khats," which "Khats" the Nagas claim to this day; the Assamese cultivated the "Khats" and gave three-fourths of the paddy to the Nagas, besides which they paid an annual sum in money fowls, cattle, &c., to the chiefs.

22. There are no less than ten different Naga tribes along the southern boundary of Circuits 9 and 10, i. e., from the Deefang or Dille River to the Dikhoo, a distance of about forty miles, and run as follows; from east to west; 1st, Bordooreenas; 2nd, Hooroomittons; 3rd, Bormittons; 4th, Baupharas; 5th, Jubookas; 6th, Namchangeegas; 7th, Lakmas; 8th, Borgeons; 9th, Jaktangs; and 10th, Koongoos.

*Bhoroosahally,—Obhoy-poor.

23. The Bordooreas are on the right bank of the Deesang or Dillee River in mouzah Jeypore, and the chief of this tribe is the Gye, or chief Rajah over 5 "changes" or village^s viz:—Hooroo, Panedooareas, Poolongees, Loongtoongees, and Kanai. All these "changes" or villages are engaged in the manufacture of salt, which they sell to the Assamese, who prefer it to the salt imported, as they think it contains some medicinal properties. Twelve years ago the Panedooareas had a dispute with the Bordooreas about the manufacture of salt, and were driven from the hills, and had to take shelter in the plains. Colonel Holroyd, then the Deputy Commissioner of Seesaugur, allowed the Panedooareas to settle on the left bank of the Deesang in Boorooachallee Mouzah.

24. The cattle disease has carried away almost all the cattle between the Dikhoo River and Golaghat, but fortunately the disease has not appeared on the eastern portion of the district up to date, and it is hoped it will die out as the winter approaches.

Copy of letter No. 169, dated Calcutta, the 9th December 1869, from LIEUTENANT-COLONEL D. C. VANRENEEN, R. A., Boundary Commissioner, Bengal, to the Superintendent, Revenue Surveys, Lower Circle.

I HAVE the honor to forward, 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 year, 1868-69.

ORISSA DIVISION (*formerly known as the Cuttack Division*).—Descriptive statements of the revised boundaries of the districts, sub-divisions, and thannahs, of this division, as sanctioned by the Government of Bengal on the 20th November 1868, have been distributed to the local authorities, to enable them to carry out the revised arrangement. A copy of the one inch district maps, and of the quarter inch map of the division, have been prepared and sent to the Surveyor General of India, for publication by Photozincography. As soon as these maps are published, copies will be forwarded to the Commissioner, with the revised limits colored thereon, for the use of his office and for that of the Magistrates. Changes from one district to another have also been noted in the village volumes of the Revenue Survey. In those parts of the districts, which were surveyed, "Mouzahwar," and of which village plans exist in the records of your office, detailed lists of villages of each thannah have been prepared. As soon as these lists are examined and printed, they will be ready for issue to the local officers.

BHAUGULPORE DIVISION.—The descriptions of the boundaries of districts, sub-divisions and thannahs, of this division, as revised in communication with the Commissioner, and the Magistrates, and submitted through your office, to the Government of Bengal, in May last, were approved of by the Lieutenant-Governor, on the 2nd June following. Copies of the above boundary descriptions, have been issued to the local authorities. Changes from one district to another, and the names of thannahs, have been noted in the village volumes, detailed lists of villages of each thannah have also been prepared, and are undergoing examination.

DACCA DIVISION.—In the boundaries of sub-divisions and thannahs, of district Dacca a few alterations have been lately proposed by the Magistrate, and the District Superintendent of Police. As soon as these are settled, revised boundary descriptions, for this district, will be prepared. Of district Backergunge, the boundaries of sub-divisions and thannahs have been revised and described, with the exception only of the portion transferred in April last, from Noacolly to Backergunge. The sub-divisional and thannah arrangements in the said portion have not yet been finally settled. The descriptive statements of sub-division and thannah boundaries, of district Mymensingh only, have been approved of by the Commissioner.

The boundaries of the thannahs and sub-divisions of district Sylhet, already laid down on the map, and described in this office, have not yet been finally approved of by the Commissioner. The Commissioner states, that the disturbances going on, on the frontier, will cause alteration of Police boundaries of this district. He has, therefore been requested to communicate to this office the final determination of the Police boundaries of district Sylhet, when the disturbances cease. Of district Furreedpore, a map, shewing the existing thannah boundaries, was sent to the Commissioner, in June last, to enable him to mark on it, in consultation with the local officers, any alterations in the limits of the thannahs. The map has not yet been received back.

RAJSHAHIE DIVISION.—The boundaries and sites of the several thannahs of districts Rungpore and Dinagepore have been laid down on the district maps, after communication with the Commissioner of Rajshahye. Descriptive statements of the thannah boundaries, of districts Maldah, Pubna, Rungpore, and Dinagepore, are in course of preparation. Those of district Rajshahye, have been partly prepared. Of district Moorsshedabad, the boundaries of a few thannahs are still remaining to be defined. A map, on a large scale, has been sent to the Commissioner for the purpose of having the required limits marked off. In district Bograh, a few changes in thannah boundaries have been proposed by the Magistrate. As soon as this is settled, boundary descriptions of the thannahs of the Bograh District, will be ready.

BURDWAN DIVISION.—Changes in the thannah boundaries in the Burdwan Division, since Major Sherwill's time have been marked off on the maps,

The Commissioner of Chota-Nagpore, in March 1869, proposed to break up the Bancoorah District, by transferring portions to districts Burdwan, Beerbhoom, Midnapore and Maunbhoom. The subject has been submitted for the decision of Government, to whom a map, shewing the existing boundaries of the several thannahs and sub-divisions of districts Burdwan Beerbhoom, Bancoorah, and Midnapore, has been sent from this office, to enable the Lieutenant-Governor to dispose of the matter.

CHITTAGONG DIVISION.—The one inch maps of districts Tipperah, Noacolly and Chittagong, which were prepared in this office and sent to the Commissioner of the division, to enable him to mark on them, the thannah and sub-divisional boundaries, as may be proposed by the local officers, have not yet been received back.

CONDUCT OF ESTABLISHMENT.—I am well satisfied with the general conduct of the members of this establishment. The Head Writer, Baboo Nebarun Chunder Mookerjee, and the Head Draftsman, Moonshee Mehir Ali, especially, continue to afford every satisfaction.

LISTS AND STATEMENTS PREPARED.

1. Detailed lists of 3,444 villages of six thannahs of district Balasore, 1,483 villages of three thannahs of district Pooree, and 2,863 villages of nine thannahs of district Cuttack, shewing name, Thakbust number, area, number of houses, and population, of each village, and the pergunnahs to which each belongs.

2. Detailed lists of 1,400 villages transferred from one district to another, *viz* :—

187 Villages of Pergunnahs Futeabad and Bhelora Chour from district Midnapore to district Balasore.

187 Villages of Pergunnah Mundulgât from district Hooghly to district Midnapore.

292 Villages of Pergunnah Bhaugulpore from district Bhaugulpore to the Sonthal Pergunnahs.

282 villages from district Noacolly to district Backergunge.

433 villages from district Rungpore to district Julpigoree.

19 villages from district Patna to district Tirhoot.

3. A detailed list of 126 villages contained in the suburbs of Calcutta.
4. Detailed list of 383 villages of three thannahs of district Julpigoree, for the district, Superintendent of Police, Julpigoree.
5. Descriptive statements of the revised boundaries of 3 districts, 8 sub-divisions, and 22 thannahs, of the Orissa Division, have been examined, corrected, printed, and distributed to the several local authorities.
6. Descriptive statement of the revised boundary between districts Bograh and Pubna prepared and submitted to the Government of Bengal.
7. Descriptive statement of the local limits of the Sealdah and Alipore Police Courts of the Calcutta Suburbs, prepared and sent to the Magistrate of 24-Pergunnahs.
8. Descriptive statements of the revised boundaries of 3 districts, 11 sub-divisions, and 35 thannahs, of the Bhaugulpore Division, have been examined, corrected, printed, and distributed to the several local authorities.—

MAPS PREPARED.

Scale 1 Mile = 1 Inch.

1. A Tracing, shewing the villages transferred from the district of Patna to that of Tirhoot, for the Government of Bengal.
2. The old and revised boundaries of district 24-Pergunnahs have been marked and colored on the District map, for the Magistrate of 24-Pergunnahs.—
3. A Tracing, shewing the villages transferred from the district of Ghazepore to that of Shahabad, sent to the Government of Bengal.
4. A Tracing, shewing the proposed local limits of the Junghypore Moonsiffce of district Moorshedabad, sent to the Judge of Moorshedabad.
5. Three Moonsiffce Maps of District Gya, shewing moonsiffce and thannah boundaries for the Judge of Gya.
6. A Tracing of the Pergunnahs, transferred from district Bhaugulpore to district Monghyr, has been prepared and added to the map of Monghyr.
7. A map shewing the boundaries of sub-divisions and thannahs of district Monghyr, for the Judge of Bhaugulpore.
8. Thannah boundaries have been marked and colored on the maps of districts Dinagepore and Rungpore, after reference to the Survey records and after communication with the Commissioner of the Rajshahie Division.
9. Two Moonsiffce Maps, of district Patna, shewing moonsiffce and thannah boundaries, for the Judge of Patna.
10. Tracings of the three districts, *viz.*, Pooree, Cuttack and Balasore, shewing the revised district boundaries, have been prepared and sent to the Surveyor General of India, for publication by Photozincography.

11. A Tracing, shewing the revised boundary between districts Bograh and Pubna, sent to the Government of Bengal.

12. A Map, shewing the boundaries of thannahs, Sunnaseekata, Boda, and Fukeer-gunge, transferred from the district of Rungpore to that of Julpigoree, for the Commissioner of the Cooch-Behar Division.

SCALE 4 MILES = 1 INCH.

13. A Map, shewing the revised boundaries of districts, sub-divisions and thannahs of the Orissa Division, sent to the Surveyor General of India, for publication by Photozincography.

14. A Tracing of the map of district Beerbhoom, shewing thannah boundaries as laid down by Major Sherwill, sent to the Commissioner of Burdwan.

15. Two copies of a map, shewing the revised boundaries of sub-divisions and thannahs of district Purneah : one for the Commissioner of Bhaugulpore, and the other for office use.

16. The revised boundries of districts, sub-divisions and thannahs, of the Orissa Division, were marked and colored on five copies of the Atlas Sheets ; four for the Commissioner of Orissa, and one for the Surveyor General's Office.

17. A Tracing of district Midnapore, shewing thannah boundaries, for F. ones, Esquire, Superintendent of Settlement and Survey.

18. District boundaries were marked and colored on the map of Tipperah and Noacolly for the Surveyor General's Office.

SCALE 8 MILES=1 INCH.

19. Two copies of the map of the Orissa Division, shewing the revised district, sub-division and thannah boundaries : one submitted to the Government of Bengal, and the other to the Deputy Surveyor General, Lower Circle.

20. A Map, shewing changes in the Koosy River, for Major Searle, Superintendent, Irrigation Department, Sahibgunge.—

21. Two copies of the map of the Bhaugulpore Division, shewing the revised zillah, sub-division, and thannah boundaries : one submitted to the Government of Bengal and the other to the Deputy Surveyor General, Lower Circle.

22. A Tracing, shewing the existing boundaries of the several thannahs and sub-divisions of districts Burdwan, Midnapore, Beerbhoom and Bancoorah, for the Government of Bengal.

SUPDT. OF REV. SURVEYS' OFFICE,
LOWER CIRCLE,
Calcutta, 12th January 1870.

} D. C. VANRENEN, *Lieut.-Colonel, R. A.*,
} *Superintendent of Revenue Surveys, Lower Circle.*

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GENERAL REPORT

ON THE

REVENUE SURVEY OPERATIONS OF THE LOWER PROVINCES

FOR

SEASON 1866-67.

1st DIVISION.

LOWER PROVINCES.

ON the transfer (in November 1866) of Mr. R. B. Smart, to the charge of the Second Division, Central Provinces, Lieutenant A. D. Butter, Assistant Revenue Surveyor, First Division, Oudh, was nominated to this Party and assumed charge in December from Mr. Brownfield, Assistant Surveyor, who had conducted the duties during the intervening month.

CHANGE OF EXECUTIVE.

2. Owing to the breaking up of the Commissariat establishments and withdrawal of the Government cattle at various points between Gowhatty and Dewangiri, the Survey Party experienced great difficulty in procuring carriage to move into the Field, and it was not till late in December, that active operations commenced. The interval between the closing of Recess and the beginning of the Field was, however, turned to account in clearing rags.

DIFFICULTY IN TAKING THE FIELD.

3. The survey of District Kamroop was resumed. The belt which came under survey lies between the portion executed last season and the Dooars, and is bounded on the east by District Durrung; on the west by the Eastern Dooars of District Goalpara. It is situated approximately between $\frac{26^{\circ}16'}{25^{\circ}36'}$ North Latitude, and East $\frac{91^{\circ}45'}{91^{\circ}45'}$ East Longitude.

POSITION OF TRACT.

4. The total area is 858 square miles, comprising 961 villages, which were all surveyed in detail, or "Mouzawar" on the full scale of four inches=one mile.

AREA.

5. An attempt was made to survey another Circuit of 400 square miles, extending to the foot of the Bhootan Hills, but owing to the sickness prevailing in these Terai tracts, the survey was abandoned and the Party withdrawn in April. This area will be completed this season.

SURVEY OF A FRONTIER CIRCUIT ABANDONED.

CONNECTION WITH G. T. SURVEY.

* Narikola H. S.
Mulaigarh H. S.

6. Two* principal stations of the Assam Longitudinal Series in District Goalparah were connected upon. Langtia a secondary point is reported as having been destroyed, apparently in search for treasure.

CONSPICUOUS OBJECTS.

7. Two conspicuous objects were fixed for future identification, viz :

1.—Noongai Hill. A schuchan tree on it.

2.—Rancegunge Haut. Bamboo post in the centre of the Haut.

8. Owing to the absence of temples, mosques, and conspicuous buildings, the Surveyor has received instructions to build masonry pillars in carefully selected places, to serve as points for future connection.
- SURVEY PILLARS.**
9. A check survey aggregating 85½ miles in length was carried through the work and proved the detail-survey to have been carefully executed.
- CHECK SURVEY.**
10. The demarcation was completed before the survey entered the District, but the Thakbust maps, the Surveyor reports, are still undergoing "revision." This subject has already been brought to the notice of the Board and need not be enlarged on.
- THAKBUST MAPS.**
11. The Surveyor bears testimony to the zealous and cheerful assistance he received from the members of his Survey Party, European and Native.
- ASSISTANTS.**
12. He also reports the hearty co-operation of the Civil Authorities, especially of Captain Sherer, the Deputy Commissioner, whose aid is warmly acknowledged.
- CIVIL AUTHORITIES.**
13. The operations of this season will embrace the Dooars, extending from the northern limits of last season's work to the foot of the Bhootan Hills and will complete that portion of District Kamroop, lying north of the Brahmapootra, leaving the country on the south of the River to be dealt with hereafter. The estimated area for the ensuing season is 612 square miles.
- PROGRAMME FOR 1867-68.**

2 N D D I V I S I O N .

LOWER PROVINCES.

14. A small Party, as per margin*, having been told off to finish the area alluded to in the last Report, para. 27, as lying west of the Soobunreeka River in District Maunbhoom, the main body of the Survey, under Captain D. Macdonald, embarked at Kooshtea for Assam, on the 30th November 1866, and landed at Debroogurh on the 14th December. No time was lost in arranging preliminaries and detailing line-cutting parties, and by the 1st January 1867, active survey operations had fairly commenced in District Luckimpoor of Assam.
- PARTY DETAILED FOR DISTRICT MAUNBHOOM.**
- * Mr. W. Sinclair, Civil Assistant, 4th Grade.
 Mr. H. Wray, Sub-Assistant, 3rd Grade.
 1 Office Assistant and Native Doctor.
 8 Native Surveyors.
 95 Measurers
15. Captain D. Macdonald was transferred to Sind on the 26th September 1866, and Lieutenant Barron, of the Huzara (Punjab) Survey, appointed to the charge of the Party.
- CHANGE OF EXECUTIVE.**
16. The Maunbhoom Party commenced work early in December 1866, and came into Recess quarters at the end of May 1867, having surveyed 303 square miles, comprising portions of Pergunnahs Cossyepara and Patkoom.
- AREA SURVEYED IN MAUNBHOOM.**
17. The system of survey was Revenue-Topographical, the tract being divided into sixty-nine blocks as a check on the plane tabling; village boundaries were not surveyed, but details of cultivation and waste were carefully defined.
- SYSTEM OF SURVEY.**

18. In addition to the area surveyed in Pergunnahs Cossyepara and Patkoom, the boundaries of twenty-four villages were re-surveyed for comparison with last year's work. As these villages were scattered over a large area, nearly a month was occupied in this harassing work, which of course does not count towards the season's outturn.

BOUNDARY SURVEY OF DETACHED VILLAGES. 19. The remainder of the boundary between Maunbhoom and Singbhoom, (mentioned in para. 23 of last year's Report,) was completed.

BOUNDARY BETWEEN MAUNBHOOM AND SINGBHOOM. 20. Sixteen minor stations of the Chota-Nagpoo Topographical Survey were connected by triangulation with the season's work, forming a good junction between Districts Maunbhoom, Singbhoom, and Chota-Nagpoo. No G. T. S. Towers fell within the limits of survey.

CONNECTION WITH CHOTA-NAGPOOR SURVEY. 21. The accuracy of the detail survey was checked by lines run across the plane table sections by Mr. Sinclair, Assistant, and Mr. Wray, Sub-Assistant.

DETAIL SURVEY. 22. The survey of District Maunbhoom, which has just been brought to a close, was commenced in December 1861, by Captain J. L. Sherwill, Revenue Surveyor.

SURVEY OF MAUNBHOOM COMPLETED. 23. The District lies between $\frac{22^{\circ}-38'}{23^{\circ}-03'}$ North Latitude, and $\frac{85^{\circ}-50'}{87^{\circ}-16'}$ East Longitude and covers an area of 5,559 square miles, of which 1,827 square miles were surveyed on the Revenue-Topographical system, and 3,732 square miles purely Revenue or Mouzawar.

TOTAL AREA.
NATURE OF SURVEY. 24. District Maunbhoom is bounded on the North by Districts Hazareebaugh, Beerbhoom and Burdwan; South by Singbhoom and Midnapore; East by Baneoorah; West by Hazareebaugh and Chota-Nagpoo.

LIMITS. 25. Survey operations in District Luckimpoor, Assam, commenced with Mouzah Jyepoor, lately transferred from District Seesaugor. Jyepoor is situated at the South-East corner of Luckimpoor, and is limited on the North by the Dehing River; South by the Desang River and District Seesaugor; East by the Naga Hills; West by the Seesaugor District and Mouzah Khowang. It lies between $\frac{27^{\circ}-6'}{27^{\circ}-21'}$ North Latitude and $\frac{96^{\circ}-4'}{95^{\circ}-30'}$ East Longitude.

FIELD OF SURVEY IN ASSAM. 26. For convenience of survey the Mouzah or Pergunnah, containing 257 square miles, was divided into forty blocks, including twenty-six Grants. The boundaries of villages are not defined, and even the Mouzah boundary, the Surveyor states, is liable to alteration. The Grants, which come under the Waste Land Rules, were separately surveyed and their limits clearly defined.

POSITION OF TRACT. 27. The lines dividing the blocks were as far as possible carried along roads and streams across open ground and through villages to make the Survey of these items as accurate as possible. The surveyor says that "all cultivation, village sites, forest glades, nullahs and beels were carefully mapped, and the area under tea cultivation accurately defined."

CHARACTER OF DETAIL SURVEY.

28. The following abstract shows at a glance the various descriptions of land in the Mouzah, given in acres :

Detailed areas in Mouzah Jyepoor.	Tea cultivation.	Cultivation other than Tea.	Barren waste.	Culturable, forest and grass lands.	Total area.
Area included in Grants ...	618	87	922	19,536	21,163
Ditto under Mouzadars ...	61	6,175	4,636	1,39,227	1,50,099
Total area ...	679	6,262	5,558	1,58,763	1,71,262

29. The Surveyor remarks on the absence of permanent marks to define the boundaries of Grants. "Although we used every means to make the boundaries of Grants agree with the Thakbust Maps and a rigid comparison was carried out, still where no permanent marks were left, I think that the result must be unsatisfactory, since such a boundary in the middle of a fast-growing jungle must soon be obliterated."

ABSENCE OF PERMANENT LAND MARKS.

30. The detail survey was tested by check lines carried through the work by the European Assistants, and the result of comparison was satisfactory.

31. The G. T. Survey triangulation not having been extended to Assam, it became necessary to fix points for future connection. The following were selected for the purpose :

1. Mark on Dadhaul hill near Jyepoor
2. Quarter Guard, Cantonment of Jyepoor.
3. Triple-junction of Jyepoor, Sebsaugor, and Naga-Hills.
4. Triple-junction of Jyepoor, Sebsaugor, and the Desang River.

ORIGIN OF SURVEY.

32. The centre of the Church Tower at Debrooghurh was adopted as the origin of survey.

ASSISTANTS.

33. Lieutenant Barron reports in high terms of all his Assistants.

34. The total outturn of the season is 570 square miles, viz:—

TOTAL OUTTURN.

In District Manbhoom ..	303 square miles
„ „ Luckimpore ..	267 „
Total ..	570 „

35. Mouzah Khowang was included in the season's programme, but owing to the survey operations having commenced so late, the interruptions caused by rain, the scarcity of labour for clearing the heavy jungle and the severe sickness which crippled the Party during this their first year in Assam, the Assistant in charge found it impossible, with his establishment reduced to almost half strength, to complete the work cut out for him.

SURVEY OF MOUZAH KHOWANG DEFERRED.

36. During the ensuing season the survey of Khowang will be taken up, and the survey extended as far east as possible over that portion of District Luckimpore which is bounded on the South by the Dahing; on the North and West by the Brahmapootra River.

PROGRAMME FOR 1867-68.

CANTONMENT SURVEY.

* Dum-Duin, Barrackpore, Fort William, Chinsura.

37. The detached Party under Mr. Sinclair will be employed on the survey of the Cantonments* urgently called for by the Secretary of State for India.

3RD DIVISION.

LOWER PROVINCES.

38. The operations of this Party were resumed in District Cachar. The country which came under survey is situated south of the Barak River
 POSITION OF TRACT. between $24^{\circ}-27'$ North Latitude ; $92^{\circ}-32'$ East Longitude, and $24^{\circ}-51'$ $92^{\circ}-50'$ embraces an area of 312 square miles.

39. The bulk of the survey left Dacca by boat early in November and reached the Civil Station of Silehar on the 26th, the Surveyor having
 DATE OF TAKING THE FIELD. preceded the establishment by six weeks in order to make arrangements for labour and the erection of boundary marks ahead of the survey, in which work he was assisted by the Deputy Commissioner.

40. Field work continued to the beginning of May, when the rains set in. For the first two months, the whole Party was employed in clearing jungle
 LINE CLEARING. along the boundaries indicated by Grantees, but owing to the late extensive failures in tea, it was in most cases found impossible to obtain assistance from the Managers of Tea Gardens, to clear lines along the boundaries of estates.

41. The rice crops in Cachar are not gathered till the middle of January, and the Surveyor states that serious
 OPPOSITION OFFERED BY VIL- opposition was offered by the villagers to the survey of lagers. standing crops.

42. Eight large triangles, emanating from a base formed by the side between Murphuta
 TRIANGULATION. and Salama G. T. S. Towers, were spread over the season's work.

43. The interior details in the plains and cleared portions of Grants have been filled up to scale. The Surveyor states that every Grant was visited by
 DETAIL SURVEY. an Assistant who personally satisfied himself of the accuracy and minuteness of the topography. Streams were traced up as far as practicable in the jungles, and those which were not accessible during the field season, were surveyed during the rains in canoes. Large streams such as the *Goonga*, *Jalinga*, *Baleeceera*, and *Larsinga*, were carefully traced up between traverse points, and the smaller streams which could not be surveyed along their entire length, have their approximate courses dotted in on the maps. The positions of the Hill Ranges have been fixed by triangulation.

44. On the subject of demarcation the Surveyor observes: "The boundaries surveyed do not agree with the Thakbust maps, but the surveyed
 DEMARCATION. boundaries, with the exception of a few still unadjusted, have been upheld by the Deputy Commissioner. I surveyed the boundaries as shown in the field, and submitted every discrepancy between the surveyed and Thakbust boundaries to the Deputy Commissioner, and I have obtained his formal sanction to every boundary on my map that differs from the Thakbust record." If the professional survey is to be upheld, it is clear the settlement survey should be cancelled. At present there are two records of the same boundary, totally different, yet both authenticated.

45. The boundary between Sylhet and the Cossyah Hills, re-adjusted by the special
 BOUNDARY BETWEEN SYLHET Boundary Commissioners, (Mr. Jones, Civil Supt. of Survey and Capt. Clark, Deputy Commissioner of the Cossyah Hills,) under orders of the Government of Bengal, No. 2428, dated
 AND THE COSSYAH HILLS.

21st September 1866, was surveyed by a detached Party of this Division. The boundary, extending over seventy miles, has been marked by forty-two mud pillars. It now remains with the Department Public Works to render this expensive boundary survey of permanent value by the erection of masonry pillars on the spots indicated by temporary marks.

46. The pay of the Assistant and his Party employed on this work alone, from the middle of November to the 24th February, and the expense of jungle clearing at the heavy cost of Rs. 12 per month for each cooly supplied by the Deputy Commissioner of the Cossyah Hills, have been thrown on the outturn in Cachar, and have, as the Surveyor observes, served to increase the cost and rates of work, since the survey of a boundary line yields no return of area.

47. The Surveyor's remarks on the difficulties and danger likely to result in an attempt to explore and survey the hilly tract lying between Cachar and Chittagong, will be found in the Appendix. These hills are inhabited by a tribe called "Looshais." Two deputations were despatched on the 3rd October last by the Deputy Commissioner to the Hill Chiefs, with the intention of explaining the objects of the survey and securing their co-operation towards the exploration and survey of the Dhulessur and Sonai Valleys, and the laying down of the eastern frontier boundary between Cachar and Manipore.

48. There still remain eighty-eight Grants for survey in Cachar, viz.:

AREA OF GRANTS REMAINING FOR SURVEY IN CACHAR.				No.	Sq. Miles.
Unopened Grants	...	...	...	51	240
Opened Grants	...	...	...	37	260
				Total	500

49. These will come under survey during the season 1867-68, and will, with the topographical survey sketched out in the preceding paragraph, fully employ this Party for the season. Under the revised system of survey which will henceforth be followed in Cachar in common with Assam, we may hopefully look forward to large areas.

50. The year under review has been quite exceptional, and difficulties quite beyond the control of the Surveyor have crippled his energies, and resulted in a small area effected at a disproportionate cost.

4TH DIVISION.

LOWER PROVINCES.

51. This Party was inspected at Dinapore early in November 1866 by the Deputy Surveyor General, and on the 15th of the same month assembled at Bhaugulpore to arrange and allot the season's work.

52. The operations embraced the survey of the River Ganges and contiguous villages on either bank, in Districts Bhaugulpore, Purneah and Maldah.

53. It was intended, in compliance with a request conveyed by the Board of Revenue, to extend the Deareh survey through Districts Moorshedabad and Rajshaye, but it was discovered that in these Districts the provisions of Act IX. of 1847 were inapplicable, ten years not having elapsed since the publication of the last survey maps.

54. In addition to the survey of the Ganges Dearehs, the survey of the relaid boundary of the Damin-i-koh was successfully accomplished. The appendix contains an elaborate report by the Revenue Surveyor on this important and long-disputed boundary, with an Index map to illustrate his remarks.

55. The total number of villages surveyed is 903 of which 727 are beyond the influence of the river, and 177 are Dearch villages, subject to yearly inundation and alteration. The area is thus distributed :—

		Sq. Miles.
500 Villages, District Bhaugulpore	= . ..	392
182 Ditto, ditto Malda	=	232
219 Ditto, ditto Purneah	=	102
3 Ditto, ditto Moorshedabad	=	1
Area of river	=	79
Total area		856

56. The Towns and Civil Stations of Monghyr and Bhaugulpore have been surveyed on the scale of twenty inches to the mile, for Municipal purposes.

57. The Dinapoor extension survey showing the country two miles all round Cantonments and the Line of the Gangetic inundation, was also completed on the scale of eight inches to the mile, to meet the call from the Secretary of State for India.

58. No comparison can be instituted between Great Trigonometrical Survey and Revenue Survey direct distances, as only one Trigonometrical Tower, Burari, falls within the work.

59. All remarkable objects have been fixed by Traverse. There are masonry platforms at village tri-junctions along the upper line of villages, and 314 of these were taken up as survey stations. The platforms in district Maldah were not built until after the withdrawal of the survey, but a Party was sent out in June to connect the points with the boundary Survey.

60. The Surveyor reports very unfavorably regarding the use of the demarcation : " Of the villages bordering the river, 193 had not only to be re-surveyed, but re-demarcated by special Amcens guided by the former Thakbust plans. I might say that the bulk of the season's work, specially so the important part of it (Dearehs) had to be re-demarcated and re-surveyed ; a very onerous task, considering how the sand on the sand banks is raised by the violent winds of March. Hence the loss of stations on the Dearehs, and objection to a fresh demarcation on the part of land-holders who know no boundary but that of possession. These annoyances would be obviated by demarcating and surveying simultaneously. Serious complaints were addressed to me by the Zemindars, who refused to accept the correctness of the boundaries then being re-laid by the Demarcation Amcens on the lands previously demarcated, but now found to disagree with the Thakbust plans." These re-demarcations and re-surveys seriously retarded professional operations and wasted the time of the Revenue Surveyor, who spent a considerable time in the field in May, adjusting these discrepancies. These obstructions must be borne in mind when considering the cost of survey.

32
61. Before retiring from the field in May, every village boundary had been adjusted and surveyed, agreeing precisely with the Thakbust maps, which were signed by the Revenue Surveyor and returned to the Deputy Collector.

COMPARISON WITH THAKBUST MAPS.

62. Early in April this Party was once more inspected by the Deputy Surveyor General, Colonel Vanrenen, who after a searching examination of every detail of work, expressed himself quite satisfied with the conduct of the survey.

INSPECTION BY THE DEPUTY SURVEYOR GENERAL.

63. Lieutenant Stewart writes in high terms of the exertions of his Assistants when they were working under physical difficulties, and suffering from repeated attacks of fever, brought on by living in the swamps and heavy jungle of the Dearehs.

ASSISTANTS.

PROGRAMME FOR 1867-68.

64. The survey during this season, 1867-68, will be over Dearch lands in District Moorshedabad, Nuddea, Rajshaye and Pubnah.

65. Number of linear miles of the Ganges and Gunduk Rivers, surveyed from 1863-64 to 1866-67 = 569. Number of linear miles of the Ganges, remaining for survey = 195, which will be completed either this season, (1867-68,) or very early in 1868-69.

66. The Cantonments and Civil Station of Berhampore will be re-surveyed on the scale of 12 inches = 1 mile, with two miles of environs.

5TH DIVISION.

LOWER PROVINCES.

FIELD OF SURVEY.

67. The survey of the West Dooars was resumed about the middle of December, 1866.

68. The tract taken up this season is bounded on the North by Bhootan; South by the Cooch-Bihar District; East by the Rydak River and the unsurveyed portion of the Dooars; West by the Dooar. Chamoorchee, surveyed in 1865-66.

LIMITS.

69. The area within these limits is 956 square miles, comprising parts of the Bulla and Buxa Dooars of the Sub-districts of Minagoorie and Allkeepoor. In addition to which eighty square miles of hills outside the new Bhootan boundary were surveyed and sketched in, making a total of 1,036 square miles as the season's outturn.

AREA.

70. The country under survey was divided into three Main Circuits, which were sub-divided into ninety-seven Polygons as a check on the Plane Tabling. A net work of forty-four secondary triangles was thrown around Buxa and over the hill tracts on the Bhootan Frontier.

MODE OF SURVEY.

71. The interior details of cultivation, waste, &c., were carefully mapped, not only in the open country, but within the Terai. Lines were cleared along streams and roads, and the hill streams traced up as far as practicable by chain and compass. The scale of survey is two inches = 1 mile.

DETAIL SURVEY.

72. Check lines were run across each Main Circuit by the European Assistants, and every possible care was taken to establish the accuracy of the detail survey.

CHECK SURVEY.

73. The Surveyor states that platforms of stone and mud, six feet square and two feet high, with a peg in the centre, and a ditch two feet wide all round the platforms, have been made as temporary marks at triple-junctions of villages and on the Bhootan boundary. Maps showing the positions of these platforms will be furnished for the guidance of the Public Works Department by whom permanent marks will be made.

DEMARICATION.

THAKBUST MAPS.

BOUNDARY BETWEEN BHOOTAN AND WEST DOOARS.

74. The comparison between the Thakbust and professional plans was satisfactory, and the few discrepancies noticed were adjusted before the survey Party adjourned to Recess.

75. The Surveyor's description of the new boundary between the West Dooars and Bhootan will be found in paragraph 26, Appendix.

CONSPICUOUS OBJECTS.

76. The positions of twelve remarkable objects, chiefly temples, bungalows and hauts were fixed by traverse and triangulation. No Trigonometrical Survey Stations were met with.

BUXA CANTONMENTS.

77. The Buxa Cantonments were surveyed on the scale of eight inches to the mile, and the hills around enclosed in a net work of thirty-eight secondary triangles.

OBSTRUCTIONS.

78. The Surveyor remarks that the country under survey being chiefly covered by forest and high grass, with a scanty population and extensive uninhabited tracts, the chief obstruction to survey was the delay and difficulty in obtaining labor for line clearing. Progress was also impeded by severe sickness which prevailed among the Surveyors throughout the season. From December to May, there were no fewer than 307 admissions into hospital. It reflects credit on Mr. O'Donel's management that in the face of these difficulties he effected a most satisfactory season's work.

ASSISTANTS.

79. He writes in high terms of all his Assistants.

PROGRAMME FOR 1867-68.

80. On completion of the West Dooars District, of which only one hundred square miles remain, the survey will, during the ensuing season, 1867-68, be extended to the East Dooars, lately transferred to District Goalpara.

6TH DIVISION.

LOWER PROVINCES.

81. Under the orders of the Bengal Government quoted in paragraph 82 of the last Report, Major Thompson was relieved on the 2nd November 1866, by Captain Sconce. This Officer remarks on the arrears of work: "On receiving charge I found the work of the previous season not fully brought up, and a considerable delay was thus occasioned before I and a portion of the establishment were free to take the field."

CHANGE OF EXECUTIVE.

ARREARS.

82. The Native Surveyors were told off on the 7th November, and the European Assistants took the field between the 20th and 26th directly after completion of their Recess duties. The Surveyor himself, on the despatch of the various survey records to the Head Quarters Office, marched from Hazareebagh on the 4th December 1866.

COMMENCEMENT OF FIELD WORK.

83. The work proposed for the season was the completion of the Palamow Pergunnah of District Lohardugga, but for reasons to be noted hereafter, this programme was modified.

84. The Surveyor's attention was first directed to the detail survey of the area previously triangulated by Major Thompson. Two main circuits, comprising 103 villages and 216 square miles were completed in detail.

85. Another Circuit was surveyed, 400 square miles triangulated, and twenty-five villages done in detail, when orders were given to suspend the survey of Palamow and run check lines across main Circuits 11 to 13, of District Hazareebagh, surveyed by Major Thompson in 1862-63.

86. The work in Pergunnah Palamow was closed on the 28th February 1867, and the remainder of the season was solely employed in testing old work in Hazareebagh.

87. The actual area surveyed during the season appears small, but it is due to the Surveyor to quote his remarks on the many difficulties he had to contend with. His explanation will be found in paragraph 18 of the Appendix.

88. In addition to the Check Survey and the area surveyed in Pergunnah Palamow, the boundary between Districts, Hazareebagh and Lohardugga, was re-surveyed, and the survey of the Hazareebagh Cantonnments commenced, on the scale of 12 inches=1 mile, and the environs, embracing in all fifty square miles, on the scale of 6 inches=1 mile. One-third of this work has been done, and the remainder will be completed either during this field season or in the Recess of 1868.

89. The survey of the hill station of Parisnath will also be made during the Recess.

90. The detail survey in Palamow has been very minute, all descriptions of land and every Topographical feature having been accurately mapped.

91. The detail check surveys were executed by the European Assistants to the extent of 38 per cent of the total number of villages, and the result of comparison is satisfactory.

92. The Surveyor states that "the field demarcation of the country surveyed was generally complete, the boundary marks were standing and easily traced. At the tri-junction points there are masonry platforms and intermediately small heaps of earth and stones with posts."

93. The Thakbust maps originally furnished were mere eye sketches, but the comparison between the professional plans and the new Thakbust plans prepared by the Revenue Surveyor according to the rules issued by the Board of Revenue, was quite satisfactory.

94. The minor triangulation has been based on the stations of the North Parisnath Meridional series noted in the margin.* The G. T. S. of Sindraili which lies in the work of season 1862-63, has been adopted as the origin of survey.

CONNECTION WITH G. T. SURVEY.
* Hurta Bagt, Nawadooh, Bijka, Sewaree.

95. The Surveyor reports favorably of the services rendered by his Covenanted ASSISTANTS. Assistant Lieutenant Samuells, and the Uncovenanted Assistants Messrs. Todd and Vvall.

96. The area remaining for survey in Pergunnah Palamow is estimated at 800 square miles, which will be completed during the ensuing season 1867-68.

1ST ON DARJEELING WASTE LANDS SURVEY.

FIELD OF SURVEY. 97. The work given to this party was the completion of the Daling Sub-division of District Darjeeling.

98. The survey Parties were started from Darjeeling on the 1st November 1866 under Mr. Cowley Sub-Assistant, but owing to the difficulty of getting coolies for line cutting, operations did not commence till the middle of the month.

99. The Surveyor was for some time detained at Darjeeling, to arrange for the Survey of certain building locations, and re-division of estates, surveyed during previous seasons.

SYSTEM OF SURVEY. 100. The system adopted in the Daling Sub-division was a combination of main Circuit traverse and minor triangulation.

TRIANGULATION. The triangulation was undertaken by the Surveyor and his Assistant, who experienced no small difficulty in travelling over a country covered with dense forest and without roads or even foot-paths. The high ranges on which the stations were fixed, were enveloped in snow, and the heavy mists which hang over these elevations obscured the signals for days together, and caused serious delay.

101. The area covered by this net work of triangles was divided into two Main Circuits comprising 224.46 square miles, in addition to which the Surveyor completed thirty square miles left unfinished last year.

102. A small circuit of 31.44 square miles enclosing a piece of Chukla Tondoo, east of the Jaldhoka River, was also surveyed, to fill up a gap in the West Dooars survey.

103. The Hope Town Settlement, alluded to in paragraph 92 of last Report, was surveyed topographically.

104. The total area surveyed during the season is 295.23 square miles, as shown below :

			<i>Square Miles.</i>
	Daling Sub-division	...	254.46
	Hope Town Settlement	...	9.38
	West Dooars	...	31.44
			<hr/>
TOTAL AREA SURVEYED.	Total	...	295.28
			<hr/>

105. The entire area was surveyed topographically on the scale of two inches to the mile. The details were laid down as minutely as the dense forests would admit of. The ranges and spurs were fixed by triangulation and intersection, and lines were run along rivers, streams and elephant tracks. The Terai portion of the district was penetrated as far as the heavy jungle would allow, and where it was too dense to admit of clearance, cross lines were run along elephant tracks and the streams sketched in. Streams so laid down are shown by dotted lines on the maps.

DETAIL SURVEY. 106. Check surveys were made and fairly tested the accuracy of the detail Survey.

107. The work in the Darjeeling District, apart from the Daling Sub-division, consisted chiefly in the survey of building sites, and the re-division of blocks given up by former purchasers and again leased out, re-sold, or reserved by Government; but as the boundaries of Government reserves have been only partially surveyed or divided, no area can be given.

GRANTS AND GOVERNMENT RESERVES. 108. As work of this desultory nature is likely to continue for years, the Civil authorities have made arrangements for the employment of a Native Surveyor.

109. Regarding the Nepal boundary on the western limits of District Darjeeling, the Surveyor states. "The pillars will be erected this cold season. I have sent out a Native Surveyor to mark their sites. Several men belonging to the Deputy Commissioner have been sent out with the Native Surveyor, to see the spots marked, so that there will be no difficulty in getting the pillars up, when the season will admit of masons being sent out. The other portions of the District boundary are formed by rivers, where there is no necessity for pillars."

110. The survey of the Daling Sub-division is now completed. This tract is bounded North by the Rungpore and Teesta Rivers, which separate it from Sikkim; South by the West Dooars; East by Bhootan; West by the Hill Territory of Darjeeling.

LIMITS OF THE DALING SUB-DIVISION. 111. The total area of the Sub-division is 485·91 square miles.

AREA. 112. The total area of District Darjeeling, of which the Sub-division forms part, is 1,234 square miles, viz:—

	<i>Square Miles.</i>
Daling Sub-division	485·91
Darjeeling Hill Territory	465·37
Hope Town Settlement	9·38
Station of Darjeeling	1·97
Pathurghata .. } Plains {	161·32
Hateegheesa .. }	110·33
Total ..	1,234·28

113. Mr. Johnson's Party has now been told off for the survey of Cantonments, in compliance with the urgent requisition of the Secretary of State for India.

WORK FOR 1867-68. The survey of the following Cantonments, with two miles of environs, will be taken in hand during the season 1867-68, on the scale of twelve inches to the mile, viz:—

Benares.
Allahabad.
Delhi.
Umballa.

2ND OR UPPER ASSAM REVENUE AND TOPOGRAPHICAL SURVEY.

114. Work recommenced in the Sebsaugor District on the 15th December 1866, in that portion of the District which lies North-East of the area surveyed last season.

SCENE OF OPERATIONS.

115. The outturn gives an area of 378 square miles, surveyed in two main circuits, containing thirty-one Grants and seventeen Mouzahs, which were sub-divided into forty-eight traverse blocks for convenience of survey.

AREA.

116. The survey was topographical on the full scale of four inches to the mile, showing boundaries of Mouzahs and all Grants demarcated at the time of survey.

CHARACTER OF SURVEY.

117. Streams and roads were traced up as far as possible in the heavy jungle, but the delay, difficulty and expense attendant on line clearing, very often baffled the Surveyor.

DETAIL SURVEY.

118. Check Surveys were made, and the detail work on the whole proved correct.

CHECK SURVEY.

119. The Surveyor remarks that no pukka pillars have been built either by the Civil Superintendent of survey, or by the planters, but two or three of the planters have put up wooden posts with earth heaped around them.

DEMARICATION.

120. The Thakbust maps gave no clue to the marks on the ground, and portions of Mouzahs were re-demarcated by the Civil Superintendent who adopted the professional survey lines as boundaries.

THAKBUST MAPS.

121. The chief obstructions to the progress of the survey were caused by the extreme difficulty of line cutting, and the impossibility of getting aid from the Mouzahdars, who would not attend even to point out the limits of their Mouzahs.

IMPEDIMENTS.

122. The great Trigonometrical Survey Triangulation not having been extended to district Sebsaugor, the Surveyor was instructed to build masonry pillars on prominent sites, to serve as points for future connection. Eight points have been selected for this purpose.

SURVEY PILLARS.

123. Considering that the Surveyor took the field with only four Native Surveyors, and six Apprentices (who were of little use) the area effected is satisfactory.

124. In reply to a reference by the Surveyor regarding the southern boundary of district Sebsaugor, the Deputy Commissioner states, "As the southern boundary of this district might eventually be extended into the Naga-Hills, you can only now survey the existing Mouzah boundaries, as they have been demarcated by Mr. King."

SOUTHERN BOUNDARY OF THE DISTRICT.

125. It is proposed this season, 1867-68, to extend the survey to the Naga-Hills Frontier on the south, and to work east to the limits of district Luckimpoor, and as far north as practicable. The area thus marked out is estimated at 400 square miles, leaving about 1,500 square miles to complete the District.

WORK FOR 1867-68.

By Surveyor's Office } (Sd/-) J. Macdonald Major
Calcutta, 2nd Decr/67 } Offy Supt of Revenue Surveys
Lower Circle,

Extract from Annual Report of the Operations of the 1st Division, Lower Provinces, Revenue Survey, by LIEUTENANT A. D. BUTTER,—Season 1866-67.

16. The country under survey during past field season was flat, and for Assam, open and well cultivated. The chief crop is paddy. Where there is no cultivation, the jungle grass grows rank, and harbours tigers and other dangerous animals. The bamboos and other graceful tropical vegetation about each village make the landscape often very beautiful. The Bhootan hills close in the view to the north, rising tier on tier; and to the south the Ceela and other bold detached hills on the bank of the Brahmapootra, with the distant straight grey line of the Cossyah and Garrow range. The villages are exceedingly picturesque; and their neatness must strike any one accustomed to district life in the North-West and Oudh. This is chiefly caused by the entire absence of mud-huts, and therefore of unsightly pits, blank walls, and ruined houses. The cottages, which are all of grass, on wooden frames, and thatched, have a cleanly look. There is usually a neat and stout fence, rendered necessary by the wild beasts, round each village, and on each side of the paths through the larger villages. At the entrance there is a "Nam-gurh," a public room, formed by a thatch-roof over the gateway, which has a social and pleasant appearance. The luxuriant palms, bamboos, &c., with many magnificent timber trees, complete as pleasant a picture as could be wished. The inhabitants, however, are selfish and inhospitable to a degree perhaps unknown elsewhere; they will neither give food nor shelter, if they can help it, for any money.

17. A great number of streams, flowing irregularly from north to south, come down from the Bhootan hills and fall into the Brahmapootra. They are all clear good water, usually with steep banks, and occasionally dangerous bottom. An elephant has frequently to wade up and down half an hour trying to cross one of these. The principal rivers in the season's work are the Monass and the Bor Nuddec, the west and east boundaries respectively of the district, dividing it from District Goalpara and the Bengal Doars on the one side, and from district Durrung on the other. The Chawlkhawa River, which flowing east and west, forms the southern boundary of the work of camp 2, is the only other noticeable stream.

18. All roads in Northern Kamroop are embankments, which during a great part of the year, pass through sheets of swamp. The frail wooden bridges are swept away by sudden floods on the numerous hill streams which intersect the country; and there is no road on which it is worth while at any time of the year to attempt to take a cart, except that from Gowhatty to Diwangiri, to which, as it is an imperial road, the above description is not intended to apply. But even upon this road the bridges are still of wood.

19. Perhaps the chief impediment to Surveyors in Assam is a heavy thick fog, which during the greater part of the field season covers the face of the country every morning. This mist does not dissipate till 10 o'clock generally; and the usual mirage sets in directly the fog has disappeared. Thus the most valuable part of a Surveyor's day is lost; for the fog is too thick to admit of work.

20. Another well-known obstacle is the difficulty of keeping up an establishment to full strength; the utter aversion of all Hindoostanees to Assam; and the high pay and local allowance necessary to induce them to stay, which has all to come out of the same maximum allowance as is fixed

for a survey elsewhere. The Assamese Proper are a miserable race of men ; but there are a class, called Kacharees, whom we have been able to enlist. These men are greatly superior to the Assamese in physique, but have their disadvantages as slashies. We have not found one who gives the least promise of learning to be of any service, except for the most ordinary manual labor. They are a sulky class of men and apt to desert, owing to the ease with which they can make a comfortable livelihood in their own villages.

21. The roads being such as I have described, carts are, of course, almost unknown in the district, and there are none for hire. Some belonging to the Department Public Works, are occasionally to be got on Her Majesty's Service, when the Executive Engineer finds himself able to lend them. Bullocks are sometimes employed, but carry very little, and have a habit of throwing their loads off or carrying them into the jungle. The only other forms of carriage are men and elephants. I have already remarked, how independent the people of the district are ; it is very difficult generally to get coolies. We have four elephants attached to the survey, and they are always hard at work. I have represented in a recent letter that without more of them, we shall find it very hard to get on in the Dooars, and also on the southern bank.

22. Although we have fortunately had few fatal cases this last field season, there is usually a very great deal of fever and dysentery in the camps ; and these and a languor, which results from the moist climate, are of course serious impediments to work.

23. It is hard to say when the actual monsoon sets in in Kamroop. Rain generally commences to fall in February, and is heavier every month. As the district soon becomes extensively under water, it is a risk to keep the establishment out in the field after May. The country has, moreover, then become unsuitable for surveying. These swamps continue to exhale malaria till so late in the year that it is not safe to take the field until December. Hence our field season is very short, especially taking into account the time lost, owing to the want of carriage in moving to and from recess quarters.

26. About February the Natives commence to set fire to jungle all over the country ; and when a Surveyor, at work, surrounded on every hand by a sea of tall dense grass, suddenly hears in several directions the roar of the approaching fire, his position is occasionally rather critical. I know several instances in which they have had to run ; and one party, whom I met in the field a few hours after their misfortune, lost nearly every scrap of property and clothes they had with them.

Extract from Annual Report of the Operations of the 2nd Division, Lower Provinces, Revenue Survey, by LIEUTENANT W. BARRON,—Season 1866-67.

MAUNBHOOM.

12. * * * The ravages of the famine do not seem to have been felt here so severely as in other parts of the Pergunnah. South of the Karkari River the country is wild and hilly. Mr. Sinclair says, "The villages along the base of the hills are sparsely populated, the inhabitants having mostly died or been imprisoned for depredations committed during the late famine. In such places supplies were not procurable and had to be got from villages seven and eight miles off. Great difficulty was also experienced in procuring labor for line cutting ; as a last resource I had to fall back on the assistance offered me by the wives and daughters of the deceased and imprisoned : the offer of a few pice found them always ready to work, though in small numbers. They are strong and hardy, able to handle the axe, as well as the men, and perform a better day's work."

13. The produce of the country is rice, dāl, kooltee, surguja, surso, raggi, tobacco, and mouwa. A large trade is carried on in rope made from a grass called "sabur," and dishes chiselled from a peculiar soft stone. These dishes are in great demand, the price varying from two to four annas. The people who cut them seem to be well off and are a particular caste called "Gors."

14. Inchagur, the capital of the Pergunnah Patkoom, and the residence of the Raja, is situated on the banks of the Karkari, which during the rains is a rapid mountain torrent, but at other times is nearly dry. Here there is a market held every Thursday and Sunday, to which flock the villagers from within a radius of seventy to eighty miles.

16. The inhabitants are principally Sontals, Bowries, Bhumiches, Bhoorias, and a Pariah tribe called Khurias. The last are of no caste, eating indiscriminately whatever can be had, and having no prejudices. Brahmins are to be found in nearly every village.

18. Mr. Sinclair says, "owing to the exposure this Party had to undergo in a proverbially unhealthy district, the health of all has suffered greatly. Ever since coming into recess, I have been under medical treatment, my establishment the same, and none of us has as yet recovered from the effects of the climate."

OF ASSAM.

Lieutenant Barron writes the following:—

39. The country is flat, and covered with dense tangled forest jungle, except in the low-lying parts which are either permanent marshes, or are covered with water during the rains only. On these the forest jungle does not grow; they are, therefore, covered either with water, reedy jungle, grass jungle, or rice cultivation. On or near these open spaces are collected all the villages and huts of the inhabitants. The only produce of importance is rice, and the inhabitants being without energy produce little more than is necessary for their own food. When tea-planting was in a flourishing condition, and many coolies were imported into the District, the price of the country rice rose greatly, and the supply being insufficient, planters had to import it from Bengal at a considerable loss; but even then the high prices did not stir up the inhabitants to cultivate more: I am inclined to think it had a contrary effect, as less labor sufficed to supply money for the purchase of opium, the invariable stimulant of the adult Assamese villagers.

40. On looking at the present state of the Mouzah of Jeypoor, and at the roads which formerly must have been large imperial works, and important means of communication, it is apparent that it must have once been thickly inhabited and well cultivated. In this Mouzah are seven lines of road, which also serve as bunds to keep the rivers from overflowing the country during the rainy season. Bounding the Mouzah on the East is the Rajghur Allee which formed the old boundary between Assam and the Naga tribes. Parallel to this, at an average distance of about two miles is the Doodur Allee, extending from Sebsaugor to Suddya, as I am informed. It is open and in good order. Running in a south-westerly direction, and forming the western boundary of Jeypoor, is the Sologoorce Allee, extending to Sebsaugor; it is remarkably straight in this part of the country. At right angles to these three roads, and extending from east to west are four roads which form bunds along the principal rivers; another also called "Sologoorce Allee" commences where the Debing debouches from the hills and follows its left bank until it reaches the Brahmapootra. The Hapnee Allee, starting from and closing on this last named

bund, crosses the centre of the Mouzah and forms a bund to the Desang. The Rajghur Allee, starting from where the Doodur Allee crosses, the Desang, runs in a north-westerly direction until it reaches the centre of the Mouzah, whence it takes a south-westerly direction and forms a bund to the Deeroee Nullah, which rises in the low marshy lands belonging to the cluster of villages known by the common name of Tinkang. The last of the four is the Mamoorah Allee, which forms a "bund" on the right bank of the Desang from the hills to the Brahmapootra. Except where the villagers or Tea-planters use these roads and keep them open, they are overgrown with forest jungle. Our line cutters had to cut down the jungle and large trees growing on them, before their courses could be mapped.

41. The Mouzah is very thinly populated; the most of the villages are to be found along the Doodur Allee, and in the centre of the Mouzah where the whole of the villages are known by the common name "Tinkang." Very few of the Grants have been cultivated, and of those that have been partially cleared, many have been allowed to lapse into jungle.

42. During the cold weather the Dehing and Desang are very low and easily fordable, but during the rains they swell to large rivers. The steamers that navigate the Brahmapootra can then go up the Dehing as far as Jeypoor. During the last rains the Steamer "Burmah" went up to Jeypoor, taking up rice, and bringing down tea and coal.

43. Coal of an excellent quality is found near Jeypoor just beyond our last season's work; it is also found on the Desang, near where it breaks through the hills. Grants of these coal-fields have been sold, and are being demarcated. I believe they will be surveyed this field season owing to their importance. Petroleum also has been found and bored for near Jeypoor, and at a place called Makoom a few miles beyond Jeypoor on the Dehing. It is doubtful as yet whether sufficient quantity can be found to make it a successful commercial speculation, but some experimenters, here, are confident that petroleum and coal would give a good return on the outlay.

44. Jeypoor is at present garrisoned by a company of the 42nd Assam Light Infantry. There is a small bazar, but no extensive trade. The road from Debrughur to Jeypoor crosses the Dehing at Tipling Ghat where there is a ferry.

45. In the jungles are found wild elephants, buffaloes, rhinoceroses, tigers, leopards, jackals, deer and wild pig, besides smaller game. * * * * *

Copy of letter No. 56, dated Cachar, the 4th September 1867, from N. T. DAVEY, ESQUIRE, Revenue Surveyor, 3rd Division, Lower Provinces, to the Officiating Deputy Surveyor General, Lower Circle.

IN reply to your Memo. No. 61,* I have the honor to report that the Sonai and Rookni Rivers were surveyed by native Surveyors Subdul and Kadur Bux, the latter of whom I regret to add died on the 9th ultimo.

* Dated 17th ultimo.

2. Till November next no field work can be attempted in the hills and jungles of Cachar. It would be profitless to send European Assistants in canoes up these streams during the rains, even if it were practicable at this season of unceasing rain to do any thing. When the proposed exploration south-ward is effected, it will then be possible to fix the positions of

the streams by connection with the points of the Triangulations, and to examine in detail the work of the native Surveyors. It will be necessary for my Assistants to go up the streams whenever the assistance of the Looshais can be obtained, and the examination of the measurements already made can be carried out, as the streams are the only routes southward. If the survey of the remaining Grants is to be completed, both the Dhullessur and Sonai Rivers for a good portion of their lengths will be fixed by traverse data. The Dhullessur to Pally Churra out-post, and Sonai to Monair-khall out-post, will come under survey by traverse Circuits.

3. In reply to Memo. No. 61 $\frac{T}{T}$ * I have to state that, the past season's Atlas Sheet

* Dated 17th ultimo.

maps could not be completed owing to every thing connected with boundaries being unadjusted as reported in my letters as per margin.† The Deputy Commissioner of Cachar, however, had the loan of the maps during the season, and he has returned them to me for completion; but they have not yet been forwarded to him. The one-inch map of the previous season was only compiled in skeleton, as the names and boundaries of Grants and Villages were liable to alteration, and were not entered to prevent erasures on the map. The details of interior were for a similar reason, not completed. This map for your Office, with the exception of a few boundaries still unadjusted, has been completed during the past month.

Extract from Annual Report of the Operations of the 3rd Division, Lower Provinces, Revenue Survey, by N. T. DAVEY, ESQUIRE,—Season 1866-67.

4. The establishment left recess quarters at Dacca early in November, and arrived at

Commencement of field work.

Silehar, the Civil Station, on the 26th November, the intervening fortnight having been spent in travelling by boat with the consent of Colonel Vanrenen, to whom I had personally explained the exceptional work in Cachar. I preceded my establishment by six weeks to make the necessary arrangements for procuring labor, and getting boundaries marked. As soon as it was practicable to travel I started on a tour (with Mr. Edgar, Officiating Deputy Commissioner,) and visited most of the Grants surveyed this season to inspect the progress of the demarcations, so that my establishment, on arrival, should be employed to the best advantage in the Grants that had labor to supply and boundaries that could be traced. Field work was continued for five months to the 1st May when field work was no longer practicable, and the periodical rains had set in. The rain-fall during April was 25 inches, and for days during the month, no out-door work was possible. The outturn was affected in little more than two and a half months of actual field measurements. For the first two months little or no measurements of any kind could be effected, and the whole establishment of native Surveyors and Measurers was employed in clearing jungle along the boundaries indicated by foot tracks, or else pointed out by the agents of Grantees. The three Assistants were almost daily in the field supervising the work of jungle clearing, and by their presence and personal communication with planters, they got the survey requirements complied with, and prevented the demand for labor becoming unnecessarily burthensome to Grantees driven to extremities by the sudden collapse of tea.

Obstructions.

It need not be disguised that the depreciation of tea property and the failure in some instances of Tea Companies and private Grantees, left half the managers of gardens, throughout this season of field work, without means to pay the current expenses of their gardens, and tended to complicate matters and make it difficult, if not impossible, for them to render prompt aid on which the progress of the survey must depend. I should note here that the rice crops in Cachar are not gathered till the middle of January, and that, with standing crops it was impracticable to measure the plain lands. It is within my experience, that to attempt to ride across country in the rice lands is resisted by the villagers "*viet armis*," and an attempt to measure before the crops had been gathered,

brought a whole village community with exaggerated complaints of every wrong that nature ingenuity could devise, with a bill of costs to compensate for the alleged injury to the crops. I mention this as illustrative of the difficulties of dealing with the natives of the country, and the difficulty found in diverting a Survey Party, temporarily stopped from any cause in the gardens, to survey in the mean while in the plains.

7th. * * * The boundaries surveyed do not agree with the Thakbust and Settlement maps of the Civil Officers, but the surveyed boundaries have been upheld by the Deputy Commissioner with the exception of a few still unadjusted. Whatever steps may be necessary to amend the Thakbust and Settlement records, and to supersede them by professional maps as records of fiscal boundaries, must, I presume, be taken by the Civil Officers; but it is incumbent on me to point out that authoritative sanction is necessary to give validity to the professional record of existing rights, and to cancel or amend the existing Thakbust and Settlement maps and papers, which, of course, remain valid documents until they are cancelled by competent authority. It is an anomaly for the survey to supersede, instead of to closely follow as a guide, the Settlement maps in regard to boundaries, and I, therefore, bring the fact prominently to notice. I surveyed the boundaries as shewn in the field, and submitted every discrepancy between the surveyed and Thakbust boundaries to the Deputy Commissioner; and I have obtained his formal sanction to every boundary on my map that differs from the Thakbust record. My responsibility and duties in connection with boundaries of Villages and Grants have therefore ended, but I beg to draw attention to the fact that the Survey, Thakbust, and Settlement maps are each authenticated records, and in many instances each map shews totally different boundaries for one and the same Grant.

10. The hilly country lying between Cachar and Chittagong is inhabited by an independent hill tribe called Looshais, who claim and hold all the tract of country to the south of the parallel of the latitude of Chatterchoora Hill, and east of Hill Tipperah to the Tepai River is the Burmese frontier. The relations of the Government with Sookpilal, the Chief of the Looshais, had been for some time back very unsatisfactory, and it was very recently proposed to send an armed expedition to punish him for a raid in which he took captive fifty British subjects. The policy was changed to one of conciliation and negotiation, and the Deputy Commissioner proposed to meet Sookpilal on the 20th February last, to make terms with him for the captives, and to try to gain his consent and aid for my proposed exploration southward. The Looshai Chief failed to appear at the time and place appointed for the interview, and negotiations were renewed through a deputation headed by Manjee How, the Kookee Chief. Major Stewart was decidedly against the risk of my attempting to carry my survey southward with the probability of complicating political negotiations then on foot, and handed me the orders of Government of Bengal quoted on margin,* which had reached him only a few days before. He, however, was of opinion that a native Surveyor might trace without much risk of coming into collision with the

* From the Secretary, Government of Bengal, to the Commissioner of Dacca, No. 50, dated 3rd January 1867.

"On the contrary any desire on the part of any European to proceed into the Looshai country or beyond the limits of the ordinary jurisdiction of the Deputy Commissioner, should be authoritatively prohibited, and they should be warned of the risk they run of putting themselves beyond the reach of protection."

hill people, the Dhullesur River

† 10 Miles direct distance south of Pally Cherra Police out-post.

Cherra out-post and surveyed by means of canoes to Gooter Mookh, beyond which Major Stewart prohibited his proceeding.‡ I have detailed at some length the relations with the Looshais, as it has not been clearly understood that my inability to penetrate into the Looshai

‡ Vide Deputy Commissioner's letter forwarded with my letter No. 10, dated 15th March 1867.

country, has not been for want of effort on my part, but is due solely to causes quite beyond my control. To attempt to force a Survey Party through an unknown country without guides or coolies to make the route clear and in spite of hostile savages, would have been a weak effort that must have proved a failure, if even no worse consequences ensued. The Officiating Deputy

Commissioner in his last communication on this subject, states as follows:—vide letter No. 370, dated 16th September 1867, Para. 2nd: “ Unless the Chiefs assent to your going down, and give you assistance in cutting jungle, &c., it will not be possible for you to do any thing. You will not be able to get any coolies from this district, and I consider it would not be safe to take Hindustanee Classies into what has been up to a late period a hostile country.” Para. 3rd: “ There are great difficulties to be overcome in dealing with them.* Sookpial is very likely to suspect that the survey of his country is connected with some plan for taking vengeance on him for the destruction of the Adampore Villages and the massacre of many of our subjects; while all the Chiefs will probably think that, survey is preparatory to the extension into their country of tea cultivation, of which they have a very lively dread.”

* Chiefs.

Extract from Annual Report of the Operations of the 4th Division, Lower Provinces, Revenue Survey, by LIEUTENANT W. J. STEWART,—Season 1866-67.

41. Before stating what has been done towards re-laying the Damin-i-koh boundary this season, it is well to notice what was done the previous season. * * * * *

Damin-i-koh.—My instructions.
It was intended that the published boundary as shewn in Captain Sherwill's map, should be defined in a permanent manner on the ground; at all events whether that was intended by the Civil authorities or not, I was led to infer that such was the wish of Government, and in various personal interviews with the local authorities, and the Commissioner of Bhaugulporc, I have made them cognizant of what was being done, and no objection was raised; moreover the section plans sent by your office for my guidance indicated this line of boundary and no other. I mention this as I have heard that doubts exist in the Boards' Office as to what were my orders in this matter.

42. With this object in view I commenced work last year in March, but found that the whole length of the line proposed for that season in Pergunnahs Teeleaghurhee and Jumoonce was disputed and the boundary (Sherwill's) by no means accepted as the correct one by either the Government Officers or the Zemindars, and before deciding on maintaining the published boundary, survey was necessary to estimate to what extent present possession would be affected thereby, as well as to ascertain by comparison whether the pillars existing were or were not those shewn as Sherwill's boundary pillars, also to verify or otherwise, the pillars built by Civil Engineers subsequent to Sherwill's village survey.

Damin-i-koh—preliminary work of last season alluded to.

43. These plans and the areas within and without the line proposed (Sherwill's) through Teleaghurhee, Jumoonce and on further as far as Mohobut-poor near the Goomanee Nuddee, were laid before the Commissioner on the 10th July 1866 in time, it was hoped, to enable Government to decide on the line of boundary to be demarcated.

Damin-i-koh—plans and areas in Teleaghurhee and Jumoonce Pergunnahs, submitted to Commissioner last recess season.

44. Such boundary, viz., Sherwill's, was decided on by the Commissioner and demarcated by me this season in the presence of the several Deputy Commissioners of the respective districts, adjoining the Damin-i-koh.

46. I commenced in company with the Assistant Commissioner of Rajmekhal to demarcate the boundary in his Division in the early part of December, commencing from the original pillar No. 44, at Shahabad temple near the Railway, working eastwards through Pergunnah Teleaghurhee. Sites for new pillars were entrusted to the Assistant Commissioner who had made arrangements for the erection thereon of intermediate masonry pillars; these points, you will find, shewn in the Plan and properly recorded in the boundary field book.

Progress of Damin-i-koh boundary demarcation.

46½. As far as Teleaghurhee Fort, west of gate or more strictly speaking a point on the Railway embankment, a few yards north of the west entrance (where a pillar is stated to have existed formerly, No. 45), though the site is now covered by the railway embankment, the boundary line had been already demarcated by Mr. Vigors, c. E.: this line is disputed throughout its entire length.

47. From Teleaghurhee Fort west entrance, Mr. Vigors demarcated the boundary by two brick pillars as far as an original pillar No. 46, named Jugrootalao in Mouzah Gungapershad; as however the west entrance of the Fort is on the west side of a steep and high hill and the Gungapershad pillar is far away on the east side, I was doubtful what line had been thus demarcated by Mr. Vigors, and survey shewed that though Mr. Vigors had demarcated a correctly straight line, still that it differed materially from Captain Sherwill's line as shewn in his published map and in the section plans sent me from your office, inasmuch as it connected pillar No. 46, not with the western No. 45 gateway, but the eastern entrance to Teleaghurhee Fort, a considerable extent of valuable paddy land amounting to 232 acres being thus enclosed in the Damin-i-koh more than Sherwill's definition of the boundary warrants.

* Letter No. 172, dated 2nd March 1867, from the Deputy Commissioner, Sonthal Pergunnahs, to the Revenue Surveyor, Fourth Division.

48. This line was decided temporarily by the Commissioner (as noted in margin*) to be demarcated according to Captain Tanner's field book, if such could be found; if not, according to Tanner's plan, which here agrees with Sherwill's.

49. Accordingly I demarcated this line, laying off the deduced bearing of pillar 46, from the Teleaghurhee western entrance No. 45, on the ray trace principle, and over the hill down the east side across the Railway and the Deareh, as shewn in the plan as far as 46 pillar, and verified and corrected it backwards from Jugrootalao pillar No. 46, the bearing recorded (as is the case all through) is referred to the true astronomical meridian and not the magnetic meridian.

51. From the Gungapershad pillar to the pillar at the west end of Sahibgunj Bazar No. 47, Sobhonpoor, no fresh pillars were erected as Mr. Vigors' pillars were found correct: this line is disputed throughout.

52. From the pillar at the west end of the Sahibgunj Bazar No. 47, as far as the original at Samdah No. 48, Mr. Vigors has permanently demarcated Captain Sherwill's boundary: this line I tested and found correct: the boundary is disputed throughout.

54. From this pillar at Samdah 48, the line was disputed as far as the next pillar but one marked No. 49; however, as no orders had reached me authorizing me to depart from Captain Sherwill's boundary, or rather the boundary shewn in the published map and sections received from your office, this boundary was demarcated as shewn therein, and the points for permanent pillars made over to the Assistant Commissioner. Subsequently as instructed by your predecessor, this boundary was altered so as to omit and eject pillar No. 48½.

55. From this pillar at Gerria Nulla marked No. 49, to the original pillar at Maharajpoor No. 50, the line was demarcated by the delineation of the bearing deduced from the traverse table, it being impossible to see from one pillar to the other owing to the intervention of the Railway embankment, a hill, a jheel, and another hill and Railway embankment—the bearing was here checked by stellar observation for Latitude and Azimuth.

57. From the last mentioned pillar No. 50, the boundary being a natural one, viz., the Gurae Nuddee, was merely surveyed and no intermediate pillars erected between it and pillar No. 1 at Burriaband.

58. At pillar No. 1, at Burriaband an Azimuth was observed, and the bearing by traverse deduced from this point to pillar No. 2, omitting pillar 1½: this line, running as it does a considerable distance across a jheel, has been demarcated by three permanent intermediate pillars. This line is disputed and formal protest against my demarcation recorded in the

Deputy Commissioner's Office by the losing party. This disputed boundary had been previously settled after reference to the Board of Revenue, but their ruling had never been carried out and is now under re-consideration.

59. From the last mentioned pillar at Kunchunpoor marked No. 2, the bearing derived from the traverse table was demarcated to pillar No. 3, "Hurdwaree Kole," where another Azimuth was observed.

60. From pillar No. 3, near the Mission bungalow at Taljairee, as far as the pillar No. 6, called Gosain, the pillars being visible one from another, only one intermediate pillar has been required between four and five and one between five and six.

61. From pillar No. 6 Gosain Tank to pillar No. 7 Nichinta, the bearing obtained from the Traverse was laid down, omitting pillar No. 6½ Bhnttooband which is ejected from the Damin boundary by Captain Sherwill: owing to the distance between these pillars, also the irregularity of the ground, four intermediate pillars have been erected on the line at points I have selected and entrusted to the Assistant Commissioner.

62. From pillar No. 7, to pillar No. 8, the bearing obtained by traverse has been demarcated, neither pillar being visible from the other. One pillar 7½, said to have been erected by Mr. Pontet has been ejected from this line as shewn by Captain Sherwill: two intermediate pillars have been erected.

63. From this pillar No. 8 at Aujoodhya the boundary has again been laid by traverse to pillar No. 9 hidden by Teen Pahar hills, and two intermediate pillars constructed. An Azimuth was observed at Teen Pahar.

64. From pillar No. 9 to pillar 10, there is no interruption to the view and no intermediate pillars have been constructed.

65. Between the last mentioned pillar No. 10 and pillar No. 11, an old pillar is standing which is not considered to be on the boundary by Captain Sherwill and has been rejected by him, thereby including much valuable land in the Damin-i-koh: the boundary as shewn by Captain Sherwill has been here defined by the bearing deduced from the traverse table, and one intermediate pillar erected: the original pillars at either end of this line are not visible one from the other: this boundary is disputed.

66. The next three pillars Nos. 12, 13 and 14, are all near each other and clearly visible one from the other, so no intermediate pillars have been built.

67. From pillar No. 14 to pillar No. 15 on Rajapuharee, the deduced bearing was demarcated and four intermediate pillars built. The bearing was here checked by Azimuth.

69. Between pillar No. 15 and pillar No. 16, one intermediate pillar was required.

70. From Teen Pahar I sent Mr. Lincké ahead to traverse from pillar to pillar between Mohobutpoor pillar No. 21 and Goomurpuhar pillar No. 25, to enable me to estimate their relative bearings.

71. From pillar 16 to pillar 17, the bearing was reduced by traverse and demarcated, two intermediate pillars were constructed; the pillars at either end of this line are not visible from each other, owing to irregularities of the ground.

72. From pillar 17 to 18, Sherwill's boundary was demarcated and two pillars built.

73. Between pillar No. 18 and pillar No. 19, near Patna bungalow, one intermediate pillar was erected, the two pillars not being visible from each other.

74. From pillar No. 19, pillar No. 20 is distinctly visible, though it was found necessary to clear away portions of large trees on the line intercepting the view, but one intermediate pillar was thought advisable.

75. From pillar No. 20 to pillar No. 21 at Mohobutpoor, the line was again demarcated according to the bearing, and two intermediate pillars erected. One pillar found as shewn in Captain Sherwill's map, exterior of the boundary marked No. 20½ in accompanying plan, has been ejected as being built by Mr. Deputy Commissioner Pontet. At Mohobutpoor, the bearing was again checked by observing for Latitude and Azimuth.

76. From Mohobutpoor I made a forced march to examine Mr. Lincke's work and check the same by stellar observation before reducing the bearing; this being done, I returned to Mohobutpoor and recommenced laying off the boundary thence in company with Mr. George Smith, Assistant Commissioner of the Pakowr Division.

77. From the Mohobutpoor pillar No. 21 to the Hathkatta pillar No. 22, the bearing was deduced from the traverse table and demarcated as shewn in Captain Sherwill's map, leaving out of the Damin, a pillar No. 21½, supposed to have been built by Mr. Pontet: the ground between these two pillars is very irregular and six intermediate pillars were built.

78. From the last mentioned pillar No. 22 to a point on Bamuni Hill where there is a heap of stones piled, called pillar No. 23, the line was laid without reference to the bearing (with which, however, it agreed,) the two ends of the line being visible from each other (with a good telescope) after clearing a few trees and jungle. An Azimuth was observed at Dhowpuhar to check the bearing at the foot of Bamuni Hill. Six intermediate pillars were built.

79. From Bamuni Hill No. 23, the pillar at Noni No. 24, is visible with the aid of a telescope; this line lies almost entirely through heavy jungle, and the intermediate space being very broken and irregular, it was thought necessary to build two intermediate pillars.

80. From this pillar at Noni No. 24, to the heap of stones on the apex of Goomur Hill No. 25, the line has been sufficiently well demarcated by Mr. Wyatt, with seven masonry pillars; these were tested and found to be strictly on the boundary; the line was cleared and all intermediate obstructions removed.

82. From here I made a forced march to Mr. Lincké, and took over his work as far as the Brahmini River, tested it by taking an Azimuth at Taldih, and reducing the bearings down, and considering Mr. Lincké competent to carry on the work without my immediate supervision, I sent him to the other side of the Damin into the Godda Division, to demarcate Sherwill's boundary from Kurmatarn bungalow, pillar No. 33, to the pillar where I had commenced at Shahabad in Telegurhee. I then returned to Goomur Hill, where I had left my camp, and in company with Lieutenant Cowan, commenced to demarcate the boundary between Goomur Hill and the pillar No. 26, at a place marked Tilbuna in Captain Sherwill's Plan, but known as Kalipuharee.

83. This was a long and troublesome line with intervening hills and almost uninterrupted forest; the bearing as deduced was first laid, and the error of direction apportioned throughout by offsets; the line was eventually made exact and seven intermediate pillars built.

84. From pillar No. 26 at Tilbuna to pillar No. 27, Daldullee, the boundary was demarcated by the bearing after the forest was cleared, the two pillars at either end were visible from each other with a good telescope, and the line was then made exact. Two intermediate pillars were built on this line.

85. From the Duldullee pillar No. 27 to the pillar at the spur of Rancepuhari, No. 28, after demarcating the bearing and clearing the forest, the pillar at the south end of the line was discovered and the line made exact; being through forest, nearly all the way irregularities in the rise of the intermediate ground preventing a distinct view, it was found necessary to build two intermediate pillars.

86. From Rancepuhari pillar to the bank of the Brahmini River the approximate bearing as shewn in the map, was laid down, and search made for Captain Sherwill's station near this. Laying off two chains to the west, I caused the ground to be thoroughly dug up and

eventually found the station with peg and charcoal almost intact ; having found this station there was no trouble in precisely fixing the intersection of the boundary shewn by Sherwill with the Brahmini River : we here built a pillar 28½.

88. On my return I found Lieutenant Cowan had made a topographical survey of the Brahmini as far as Paturkhoondee, and his traverse was kept carefully in the prescribed form of field book for Main Circuit measurements.

89. At Paturkhoondee I checked his bearing by an Azimuth and found his work on the Brahmini correct.

90. At Paturkhoondee the Deputy Commissioner of the Sonthal Pergunnahs joined us and accompanied us as far as Chuggut Puhar on the west side.

91. Between Paturkhoondee No. 29 and Sooltana pillar No. 30, a point was found from which both ends of the line could be seen, so that it was easy to find by shifting the theodolite, a point exactly on the required line; this being obtained the boundary was demarcated and two pillars erected.

92. From Sooltana pillar No. 30 the next pillar at Kurmapuhari No. 31 was visible; and this line was, therefore, easily cut and demarcated and two intermediate pillars built thereon: a pillar, Pontet's Sejooodoom, west of this line, is standing supposed to be built by Mr. Pontet.

93. From Kurmapuhari 31, under favorable circumstances, the pillar on Chuggut Puhari 32, was visible, so that a few intermediate points being fixed with theodolite, the line was cut right through, though it was found necessary to run a traverse round both hills, to attain the correct distance between the points on the hill. On this line eight pillars were built.

94. From Chuggut Puhari pillar 32, to Kurmatarud pillar 33, is a very long distance (over seventeen miles); but noticing in Captain Sherwill's map that the boundary crosses a hill near Kalajar called Byjal Puhari, I went to this hill in hopes of finding some point on the line from which I could see both ends of the line; after clearing the hill of forest trees on the whole of the top, and removing several boulders and rocks, I succeeded in placing my theodolite on a spot exactly on the line, from which I could see both ends. After laying off points north and south on the plain, I returned to Chuggut Puhari.

95. This line was demarcated without further difficulty, twelve intermediate pillars being built and Chuggut Puhar and Kalajar Puhar both traversed round to obtain correct measurements.

96. At Kurmatani I took my last Azimuth to check the bearing, which so far was perfectly correct.

97. Before leaving Taldip on the east side, where the Pakowr Assistant Commissioner left me, I sent back starting from my Azimuth stations there a party under a good Native Surveyor to survey the line of possession demarcated by the Assistant Commissioner between Taldeh and Mohobutpore pillars.

98. In the same manner and for the same purpose, I sent back another Party from Kurmatani to survey the line of possession between that place and Paturkhoondee demarcated for him by the Assistant Commissioner of Doomkah.

99. While at Kurmatani I was suddenly re-called to Bhaugulpore to meet the Deputy Surveyor General, who arrived at my camp there on the 1st April. I had scarcely time to reach there at the appointed day, and was consequently prevented from fully inspecting Mr. Lincké's work from Kurmtaur to Baltok Hill. Lieutenant Cowan was so ill from fever that he was also obliged to be brought into Bhaugulpore to receive medical treatment.

100. Therefore from this point Kurmtaur, the boundary was demarcated and reported on by Mr. J. E. P. Lincké.

101. Between Kurmtaur pillar 33, and Teloobun tank No. 34, five new pillars were built; there is also on the line of boundary a pillar of Mr. Pontet's at Telooleela. The country is open and cultivated though cut up by ravines.

102. From Teloobun tank 34, to Gunesseeree Hill 35, four intermediate new pillars have been built to mark the boundary, a pillar has been built by Mr. Pontet on the west side of the true boundary and outside the Damin-i-koh.

103. From Gunessceeree Hill to Bullia 36, three intermediate new pillars have been erected on the boundary, leaving out a pillar of Mr. Pontet's at Balacheenee.

104. Between Bullia 36 and Paharpoor 37, four new intermediate pillars have been built; there is also a pillar of Mr. Pontet's inside the Damin boundary a little off the line.

105. Between Paharpoor 37 and Doomoria 38, no new pillars are required.

106. Between Doomoria 38 and Nowadhee 39, one new pillar has been built at Bisoopoor.

107. Between Nowadhee 39 and Bungaon 40, a new pillar has been erected at Raidhee.

108. Between Bungaon 40 and Murroro 41, one pillar has been built at Barodhee.

109. Between Murroro 41 and Kooturhee 42, one pillar has been built at Tilooria.

110. Between 42 Kooturhee and Baltok Hill 43, one pillar has been built at Gokoola.

111. Between Baltok Hill and Shahabad two new pillars have been built.

112. The demarcation and survey of the boundary from Kurmtaur to Shahabad, occupied Mr. Lincké from the 26th February 1867, until the 29th April 1867, when he rejoined the Head Quarter Camp at Bhaugulpore * * * * *

113. The entire boundary has been demarcated between the pillars by stakes four feet in length and mounds of six feet over them; these stakes have been all accurately alligned by myself and Parties at every two chains, and high mounds erected over them by the Sonthals under the directions of the Assistant Commissioners.

114. After the 15th March, the climate in these hills renders surveying of any sort nearly impracticable. The Deputy Commissioner, myself, Lieutenant Cowan, and nearly all my native Surveyors, measurers and servants, were attacked with remittent fever and ague, between the 15th March and 1st April.

Extract from Annual Report of the Operations of the 5th Division, Lower Provinces, Revenue Survey, by J. H. O'DONEL Esq.,—Season 1866-67.

26. The new boundary on Bhootan along the West Dooars District commences from the confluence of the Jetea Nuddee with the Dechee or Juldoka River. It runs along the foot of the hills to the Alaikooree or Pana Nuddee. Thirty-seven platforms mark the boundary up to this point on the
New boundary on Bhootan.

western side of the Buxa Hill Tract. The foot of the hills from pillar to pillar forms the boundary except from platform No. 1 to 2 along the western bank of Jetee Nuddee for $4\frac{1}{2}$ miles, and from No. 4 to 5 along the Gantheea Nuddee for $2\frac{1}{2}$ miles. From No. 25 to 29 the platforms are on spurs of hills adjoining the Balla uplands on which are situated the villages of Doomchee, Topabasa and Sontarabaree occupied by Mech and Toto ryots. The boundary along the Buxa Hills commences from platform No. 37. From No. 37 to 38, the boundary runs along the Northern bank of the Alaikooree or Pana Nuddee called the Western branch of the Deemah Nuddee: From No. 38 along the Gechejo Pass to No. 39 Gechejo Hill on the Sinchula Range: From thence on the crest of the Sinchula Range to No. 41 Jyntee Hill: From No. 41 along the slope of the hill and Jynteechoo Nullah, known as the eastern branch of the Jangtee Nuddee, to No. 42 on the Jangtee Nuddee where the Buxa Hills terminate. From No. 42 to 47 the boundary again runs along the foot of the hills to the Thingchoo or Rydak River. For a distance of $86\frac{1}{2}$ miles, forty-seven marks for platforms have been erected.

28. The West Dooars include the tract of country at the base of the Bhootan Hills from the Teesta River to the Sunkos River on the East. It is about twenty-five miles broad, and terminates on the northern limits of Rungpore and Cooch-Behar. The portion east of Dooar Chamoorchee to the Rydak River has been surveyed during season 1866-67. Of the total area of 956 square miles, 47 square miles only are under cultivation, the remaining 909 square miles are covered with grass and forest.

29. The land rises gradually to the foot of the hills forming an upper plain about twelve miles broad of sand, gravel, and stones unfit for rice cultivation. Within this upper belt the beds of streams are almost all dry water courses; the water runs underground, and except in the large rivers, which flow from the snowy range, and Moojnaie Nuddee, water is not easily procurable. Water for domestic purposes is conveyed, nearly two miles in pipes and troughs formed of the hollowed trunks of trees and bamboos supported on cross-sticks, from springs in the hills to the villages of Sontarabaree and Topobasa. In other villages the women are out half the day and return with water-pots filled from the Bundapanee water-fall, or the Moojnaie Nuddee. Cotton, the principal crop, is sown on fresh land every year. A few plantains, tobacco, vegetables and mustard seed grow near the temporary villages, occupied by the Mech and Garrows, which are changed every two or three years as the land becomes unproductive. There is however sufficient soil to produce luxuriant forests of saul, seesoo and other trees, and a coarse high grass ten to thirty feet high; the fogs and mists and constant evaporation at the foot of the hills increase the productive powers of the naturally poor soil.

30. The lower portion is a flat alluvial plain, well watered by numerous small streams and capable of yielding rich crops, such as rice, sugar-cane, hemp, tobacco, oil-seeds, &c. The cultivation is now in small patches intermixed with grass jungle. The villages are scattered over the cultivation in hamlets of two or three houses. Bamboos and fruit trees are very scarce except round a few old villages. Herds of deer, hogs, and buffaloes are very destructive to the crops. Watching crops at night is harassing, and the loss sustained is generally from five to ten per cent of the grass produce.

31. The villages of Sontarabaree, Topobasa and part of Doomchee are situated on an elevated plateau about 200 feet high to the north-east of Balla Dooar towards the Toorsa River. The village of Sontarabaree is surrounded by orange groves and other fruit trees. The oranges are brought away on bullock loads and sold in the markets of the neighbouring districts. The area of the plateau is thirty square miles.

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32. The area of the Buxa Hills is fifty square miles ; the heights of hills are approximate ; they have been computed from the Bangabaree plain on the Rydak River. The Sinchula Range on the northern boundary attains an elevation of 5,910 feet at the peak of the same name close to the spot marked as Colonel Bruce's camp. There is not a single spring on the crest of the range, and the only water in Wumchoo is in hollows much discolored by vegetable matter. Water can be had from 500 to 1500 feet below on the slopes, but the ascents and descents are very steep. There is the same difficulty in obtaining water at Chuchkum, 4,390 feet on a spar lower down along the road where there is an old Bhotia Stockade. The Sinchula range is five miles from the foot of the hills. Buxa, about 1700 feet above the plains, is situated midway ; it is surrounded on three sides by Hills and only open to the south. A Regiment of Native Infantry is stationed at Buxa ; the Right Picket occupy the Umunea Hill, 2,086 feet high, and the left Picket, the Chereleeka Hill, 2,457 feet high. The Commissioner's and Assistant Commissioner's Offices and Post Office, are the only public buildings, within the small plot of ground 5.75 acres on the left of the road, called the Civil Station. The Bazar and Police station are little lower down. Carts can proceed to Sontarabaree at the foot of the hills, where Commissariat Stores and Cattle are kept near the cleared encamping ground. The summits of the Sinchula, Sachaphoo, Pamooseh and Tushgaon Hills are wide and habitable, but only on Tushgaon Hill, 2,230 feet high to the south east of Buxa, can water be obtained with facility. Limestone is plentiful all round Buxa and coal has been found near the sources of the Deemah Nuddee. The cantonments, civil station, and suburbs of Buxa have been surveyed on a scale of 8 inches= 1 mile.

33. There are no towns or large villages. Aleepoor the Head Quarters of the Sub-district of the same name is situated on the Kaljane River on the road Between Cooch-Behar and Buxa. In addition to the Assistant Commissioner's Office, there is Police Station, a Post Office and a small Bazar with two moodees' shops, all surrounded by high grass jungle. The Assistant Commissioner remains at Buxa during the rainy season. After the troops left Patlakowa in December 1865, it was entirely deserted. The Bungalows have been sold and the materials removed ; two or three are still standing, one is used as a rest-house. At Falakata, there is a Police Station, a large Haut and a Traveller's Bungalow, with two rooms six by eight feet each.

34. The total number of inhabitants is 12,564, exclusive of the troops and camp followers at Buxa, or thirteen to the square mile. They are detailed below :

Rajbungsee or Hindoos	...	..	...	...	9,380
Mussulmen	...	...	...	...	605
Mech and Garrows	...	...	..	..	2,423
Totos	...	..	...	..	84
Bhotias	...	...	..	..	67
					12,564
			Total	...	...

The Hindoos and Mussulmen occupy the villages in the cultivated tracts bordering on Cooch-Behar, they are very inadequate in numbers for increasing the cultivation of the extensive waste lands of the Dooars. The Mech, Garrows and Totos occupy the villages near the foot of the hills. The few Garrows have settled in the Dooars for many years, they are a very quiet inoffensive people, very different from the Bemulloa Garrows of Goalpara. The Totos live in the village of Sontarabaree. All Mech, Garrows and Totos cultivate cotton ; they pay Rupees 4 a dao as land rent. The Bhotias live in the village of Sachaphoo, at the confluence of the Sachaphoo and Koseeloom Nullahs ; they support themselves by cultivating vegetables for the market at Buxa. Chichakhata is a resting place in the plains for Bhotia traders ; four or five interpreters generally reside there.

36. The principal rivers are the Toorsa and Rydak ; they flow from the Snowy-range.
 Rivers. The Toorsa enters the Dooars east of the village of Sontarabaree ; during the dry season it flows in a narrow stony bed 200 to 400 feet wide, the current is strong, and it is fordable with great difficulty ; several persons hold each others hands as they cross. It becomes deeper as it enters alluvial soil below Madaree Haut, and is crossed by a Ferry at Raichenga Ghât where the new road to Aleepoor passes it. There are several old beds both on the east and west of the present main stream which now flows midway. Within the last fifteen years, the old bed near Patlakowa, still a flowing stream all the year, formed the main stream. The Rydak leaves the hills near the Bangabaree plain ; it becomes deeper at Teamaree Ghat on the road to Dutmah. The banks of both rivers are low, and the country on either side being subject to inundation, there are no villages on the banks. Except the ferry boats no others are seen on the rivers.

37. The minor streams are the Moojnaie and Doodooa in Balla Dooar. The Alaikooree
 Minor stream. or Pana Nuddee and the Deemah Nuddee flow from the Sinchula range and unite at Aleepoor, where the joint stream is called Kaljane. The Jangtee Nuddee also has its sources in the Sinchula range ; it is called Guddadhur in the lower part of its course, and joins the Kaljane six miles below Aleepoor. These streams and several smaller ones are principally valuable for floating down timber from the Buxa saul forest, for irrigation and for domestic use.

38. The road from Cooch-Behar to Buxa is kept in very good order ; carts can pass
 Roads. easily to Sontarabaree at the foot of the Buxa Hills ; the road was opened out further to Murichom in Bhootan. Elephants and laden cattle can traverse it with ease to the great convenience of traders. The road from Julpeegooree to Dutmah runs east and west across the Dooars. It was not open last April for carts to Aleepoor for want of bridges and Ferries. To the east of Aleepoor it was barely passable for foot passengers ; except at the Rydak Ghat there were no other Ferries. Instruments were carried across streams by men up to their necks in water at very great risk. Foot-paths connect villages, but they are difficult to find in the high grass and forests without guides. There is no trace left of several roads opened out during the Bhootan War.

39. The Bhotias bring down from the hills cattle, dogs, Thibet-silks, and blankets,
 Trade. butter, honey, wax, musk, and yak-tails, which they barter for tobacco, goor and English cloths.

40. The Buxa saul forests extend from the Toorsa River on the west to the Rydak
 Forests. River on the east, and from Chechakhata to the foot of the hills. In many places the forest is much intermixed with grass, in others it is only scattered in small clumps, but between the Gurum and Jangtee Nuddees, the largest and best timber is in great abundance. Large creepers like cables, render the forest impenetrable. The timber trade in Buxa is carried on by two natives who reside in the villages of Chokeerbos and Panbaree ; they hold Bhootia pottahs for cutting timber countersigned by the Commissioner. They pay Rupees 2-3 annually, and are allowed to cut, within certain limits, all trees above a cubit in diameter. These extensive valuable saul forests, worth lacs, but now entirely neglected, would yield a large increasing Revenue every year, if looked after. The Kaljane and Guddadhur Nuddees afford facilities for floating down timber to the Brahmapootra River.

Extract from Annual Report of the Operations of the 6th Division, Lower Provinces, Revenue Survey, by CAPTAIN J. SCONCE,—Season, 1866-67.

3. On receiving charge I found the work of the previous season not fully brought up, and a considerable delay was thus occasioned before I and a portion of the establishment were free to take the field.
 Delay in taking the Field.

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18. The chief reason for the small outturn is that the working season extended over a period of hardly three months, still the area accomplished during these months is small, and in explanation, I would offer the following remarks :

Reasons for small outturn, and comparison with the work of last season.

1st. There were natural difficulties. The country was intricate, being much intersected by streams and closely covered with jungle ; the details for survey were thus numerous, and from the necessity of clearing a ray for almost every chain line, the progress of the work was much retarded. * * * * *

2nd. To cope with a country where the work was necessarily tedious, the establishment was very much under strength ; the season commenced with only sixteen field Parties.

3rd. I request attention to the specimen sheets, with original board plans of the previous season attached, submitted under instructions from Lieutenant-Colonel D. C. Vanrenen, Deputy Surveyor General, with my Memorandum No. 67, dated 20th June 1867, from which it will be seen, although my predecessor with the same establishment made more rapid progress, that the work of previous seasons was not so searching. * * * * *

26. There is now remaining for survey in Purgunnah Palamow, an estimated area of 800 square miles, which I hope to be able to accomplish during the coming field season. It was originally proposed after Palamow should be completed, that the re-survey of Main Circuit Nos. 1 to 7, of the Hazareebaugh district should be taken up ; but I am not aware what the intentions of the Surveyor General on this point now are. I beg to draw your immediate attention to this, in order that the demarcation of the District for future operations may be taken in hand without delay. * * * * *

30. * * * * * The country is almost entirely covered with jungle, the cleared lands round the village sites bearing a very small proportion to the total village area. This jungle is seldom of much value, but a little *Sal* timber of fair size may be found towards the south-west and on the *Huttaie* Range. Great store is set on their rice land by all the villages ; these are of limited extent, but have been prepared at considerable labor and expense, and are for the most part terraced fields along the course of the smaller streams. They generally produce excellent crops. Small clearances of a few acres in extent are frequently met with in the jungle, these are usually cultivated for a single season after having been slightly fertilized by burning branches of trees spread over the land. The crops are the various oil seeds, and on the high grounds, cotton. The *Huttaie* hill is a broad bold feature, more prominent from the south. The *Arapoor* hill is of a sugar-loaf form and is also a prominent object. The village sites are much scattered, and generally intermixed with cultivation. The huts have usually coarse mat sides with a thin thatch, and are of the poorest description. A tiled roof with mud walls is a rarity and always attracts attention. The principal villages are *Rujdiria*, *Jutkoh* and *Kowl*. At *Nowa*, itself a small village, a weekly market is held on Saturdays. The market of *Pandoo* a large village in the *Gya* District about 2½ miles north-west of *Kouriya* is much resorted to. The direct route between *Gurwa* and *Maharajunge*, passes by *Cheepadohur Kulan*, *Rujdiria* and *Nowa* ; the road is quite impracticable for carts, but there is a considerable traffic by pack bullocks. Another road of a similar description from *Daltongunge* by *Kunda Khas* joins the above at *Nowa*.

Description of the country in Main Circuit, No. 5 A.

31. *Tuppeh Oodeypoor* which includes a large area of Main Circuit No. 6 A, is a portion of the estate of Jagheerdar who resides at *Chainpoor* near *Daltongunge*. The surface of the country is very irregular, much intersected by streams and ravines. The jungle which covers the whole extent is of little value, only suited for the requirements of the villages. Where practicable the courses of the streams have been extensively terraced for rice cultivation.

Description of the country in Main Circuit, No. 6 A.

The fields thus prepared receive the washings from the adjacent lands and have generally a very rich soil. There is also some excellent upland which is suitable for various crops. Gram is extensively grown and exported. Land of the highest elevation is chosen for cotton, which also forms an article of export. Another article of large export is *Ghec*, the produce of cattle belonging to the Purgunnah, as well as of herds brought from other districts for the extensive grazing. The huts in the villages are of the poorest description, no building of a permanent character being ever met with. The population is very scanty, the average inhabitants for this Circuit being 30.8 per square mile. The roads generally follow the water-sheds so as to avoid the deep ravines by which the whole country is intersected; they are mere foot paths, quite impracticable for carts. A main line of communication from the Sergoojah state traverses the Circuit by *Beerajpoor*, *Runkunda*, and *Dhawa* towards Daltongunge; there is a considerable traffic during the cold weather month.

The *Hatoo Nuddee* is the only stream of importance; it has a broad rocky bed, but is almost dry during the hot season.

Extract from Annual Report of the Operations of the 1st or Darjeeling Revenue and Topographical Survey, by E. T. S. JOHNSON, Esq.,—Season 1866-67.

13. * * * * * In the Darjeeling district, both in the Hills and Terai, it is likely that blocks will have to be demarcated hereafter as planters apply for lands; but up to the present time all such work, as far as I have received, I have finished off. It is also likely that some of the estates will have to be re-demarcated, in consequence of the proprietors not having put up their boundary pillars, on the survey being made. But I am glad to say, that, several of the planters now see the necessity of these pillars, and are gradually erecting them.

14. The Civil authorities are making arrangements for getting a native Surveyor to be permanently employed in this District.

17. The survey difficulties have already been commented upon in former reports, and it is not saying too much, that a more difficult country could not be met with; as from the absence of inhabitants and the want of any foot-paths or roads, it was no easy matter for a person to travel about the Daling Hills; even the few Bhootias I had with me knew little or nothing about their own country; consequently both Mr. Cowley and myself experienced very great difficulty in going about; even Hill ponies being perfectly useless. In one instance it took me four days to get to a place five miles away, this I accomplished with the utmost difficulty over precipices and snow eight to ten feet deep, in fact, from the very great exertion undergone in getting up and down the precipices, I with a great number of my coolies, suffered much from fever. Another great disadvantage to the progress of work in these hills, is the continual clouds and mists which hang about the high ranges. I had to move about for two months to try and observe the few angles that were required to be taken, and then they were observed with the greatest trouble, by watching for an opportunity. Of course my continual moving about, gave me a very fair idea of the nature of the country which was a great advantage in enabling me to delineate the hill features correctly. * * * * *

* * * * * Taken on the whole it is a wild and inhospitable country, and with the exception of milk and butter, no provisions are procurable. What the Bhootias can supply they will not give to Europeans, nor will they render them any assistance. They dislike and hate us, and do not hesitate to shew it. In no country have I met people so deceitful and utterly degraded as the Bhootias. The Lamas or Priests possess considerable influence over the people. They are proud of their learning, and pretend to know more than Europeans. The paintings on the

Lamas.

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walls of the monasteries that I have seen certainly shew some skill in the art, but beyond it, I do not see what they can boast of.

Religion. The religion is Buddhism.

Soil. The soil as stated in my last report is exceedingly fertile where flats occur, and adapted almost to every kind of cereal.

The valley of Rhenock is one of the richest in produce, and in it, there are numerous monasteries occupied by fat priests, and the upper class of Bhotiahs. Here I was astonished to see people resembling the natives of the plains in appearance, very different from the flat-featured and smooth-faced Bhotiahs. On enquiry, I was told that they were the descendants of Bengali women, carried off from the plains, and Bhotiah fathers.

Roads. The road to Western China, Thibet, passes through this valley, and to the east of Dumsong, and in the cold season Traffic. there is a considerable amount of traffic on this line; the Thibetans bringing ponies, yaks, yak-tails, musk, salt, sheep, goats, dogs, blankets, wool, knives, &c, and importing principally sugar, tobacco, and rice.

The Bhotiahs and Thibetans do not understand the term "Thibet"; if they are asked where they come from, they reply "Cheen." In my last report, I gave a description of the vegetables and fruits found in these mountains. I now mention a few of the principal trees. Oak, chesnut, magnolia, rhododendron, cinnamon, walnut, birch, holly, aliacs of two or three kinds, cherries, pine, figs, banian, "sal," "sissoo," "toon," Soap-worts, bamboos, rhubarb, limes, &c.

In the dense forest at the immediate base of the mountains are found wild animals of every description, amongst these are:—elephants, tigers, leopards, panthers, bears, and buffaloes, also deer of many kinds. In passing through the Terai, I shot a Boa-Constrictor which measured eighteen feet in length; I was told by the Mechias, that they had seen some much larger.

18. In addition to the above remarks I may say, that the country generally is adapted for Tea; the soil appears rich, and the spurs next to the plains are not very elevated. The soil there is the best, and could, if necessary, be well watered. But it is unlikely that any one will speculate in Teagardens after the failures in the Darjeeling district.

19. The Daling Sub-division is valuable in timber trees, the Terai part having a quantity of "sal," and the higher elevations, oaks, &c.

20. The principal rivers of Daling are, the Dechu, Mochu, Machu, Narchu, and the Teesta to the West; all these rivers have a considerable body of water, and are well adapted for irrigating the Terai; The word "chu" signifies in Bhotia, water.

21. There are no roads to be met with in the Sub-division but the cleared foot-path leading from Darjeeling to Daling. To the eastern part of the District, and the hills overlooking the Terai, there is not the slightest trace of a human path. The tracks of wild animals are of course numerous. * * * * *

Extract from Annual Report of the Operations of the 2nd or Upper Assam Revenue and Topographical Survey, by H. B. TALBOT, Esq., Season, 1866-67.

20. THE station of Seesaugor is situated on the bund of a tank of that name, about ten or twelve miles inland in a straight line from the left bank of the Brahmapootra River, coming up from the river the station is not seen till you are on the bund. The large tank, containing an area of 114 acres, the grand old temples on the south side, and the houses shewing through foliage, make altogether a very fine view when seen for the first time. There are very few dwelling houses, and those few are in a dilapidated state. The bazar, which runs along the bank of the Deekho River, is a miserable lot of grass huts.

21. The temples of Seesaugor are supposed to have been built in the reign of Shiboo Sing, eldest son of Roodro Sing, in 1722. Only two temples were built before them in Upper Assam. The first, of Joysaugor in 1698 by Rodro Sing, and the other of Gowree Saugor by Shiboo Sing in 1718.

22. The palace, in Mouzah Metaka, is near the temple of Joysaugor, and was built by Roodro Singh in 1698. It is a low dark dismal looking brick-building nearly covered over with jungle, and enclosed by a brick wall. The roof has fallen in in several parts, but the walls seem firm, though here and there great holes are to be seen in them, as well as in the flooring, made by people searching for treasure.

23. The Deehing, which is a portion of the northern boundary of the District, is the largest river in the District, but so full of grass that navigation by steamer is very difficult. In the winter it becomes very shallow like the other Rivers of Assam. The two next largest are the Deesang and the Deekho.

24. The district roads have been falling into decay for several years, owing to the small amount allowed for their repairs; but I believe a much larger sum has been granted this year, and it is hoped a few of the roads will be put into better order.

25. The bands, which are also used as roads, are in such a shameful state that they offer no check, and the rivers are constantly flowing over and flooding the country during the rains. I know of one case in which a planter had to close a garden on which he had spent 70,000 Rupees owing to this.

26. The Assamese, who are generally described as a weak, effeminate, incapable race, appear rather different to me; they are large-made and strong-looking, more manly than the Bengalees, very contriving, and quite capable of much hard work; are lazy opium-eaters, and indifferent to money. So long as they have their huts and enough rice and opium, and these they can have with ease owing to the smallness of land revenue, they care little for any thing more. The women are more active. The men merely plough the fields, the sowing, reaping, &c., &c., are all done by the women, who also keep the shops. The opening of the tea gardens has made the Assamese comparatively rich, and a little more civilized. They have taken to using brass and copper pots and pans, and their women to wearing gold ornaments.

27. There are no regular weights in Assam, nearly every thing is sold by measurements, which are called cottahs, don, and poorahs; 10 cottahs = 1 don, and 3 dons = 1 poorah; one poorah is supposed to be the weight of 15 seers, but the quantity varies for different articles. In the district I have often had eleven seers weight of paddy sent me for a poorah.

28. Agriculture is in a most deplorable state. The proportion that cultivated land bears to that fit for cultivation and forest is about one-fourth. This may be owing to two causes, scantiness of population, and revenue for uncultivated land being so little less; only 4 annas per acre than for that under cultivation. The assessment of cultivated land is at a very low rate, and might easily be raised to, at least, double; and if that of the uncultivated land was reduced about one-fifth, it might be an inducement to extend cultivation. The land is as fine and the agriculturists better able to pay, than in most parts of India.

29. The Naga Hills which border on the Seelssauger District, are inhabited by a hardy set of savages of various tribes; each tribe with its own chief. They are constantly at war with each other, but very peaceable when they come down to the plains, which they do only in the winter, to exchange their goods, such as cotton, ginger, chillies, and small bamboo-mats, &c., for salt, rice and shells, &c., with the Kayahs, or Marwaree merchants, who seem to have monopolized the trade of Assam.

30. Tea has taken quite a different turn since last year. While last year a purchaser was never wanting for the smallest patch of land, this year planters have been very glad to take advantage of the late orders of Government to throw up several of their grants. Three grants have been thrown up in circuit No. 6, two in Mouzah "Thowra," and one in "Bockota," besides several others in other Mouzahs.

36. * * * The difficulties met with in clearing the jungle for survey, both of Grants and Mowzahs, were very great, and I had, in several instances, to attend personally to the clearing of the lines of the Mowzahs, as the Mouzahdars would render no assistance to the native Surveyors or line cutters, though they had been warned of the coming survey months before. * * *

Copy of letter No. 133, dated 22nd November 1867, from MAJOR J. MACDONALD, Officiating Boundary Commissioner, to the Deputy Surveyor General, Lower Circle.

I have the honor to forward, for submission to his Honor the Lieutenant Governor of Bengal, the Annual Report, together with the accompanying statement of work performed in my office during the year 1866-67.

2. The records of the Patna Division are complete in all its branches. The detailed Lists of villages appertaining to different Thannahs of all districts with also Abstract statements, showing name, Thakbust number, area, houses, &c., of each village, have been printed, and distributed to the several local authorities for their use.

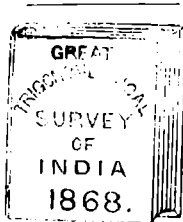
3. The statements describing the revised Zillah, Sub-Division and Thannah boundaries in the districts of Bhaugulpore and Monghyr, have been very recently returned to this office by the Commissioner, to whom they were sent in March 1865. Those relating to the district of Purneah are still with him for examination.

4. The descriptive statements of re-adjusted Zillah, Sub-Division and Thannah boundaries in the Cuttack Division, together with Lists of transfers from one Zillah to another, were prepared and sent by my predecessor to the Commissioner of the Division, on the 12th March 1866, for final examination. They were returned to this office, on the 30th October, with discrepancies still requiring explanation.

5. The descriptive statements of Zillah, Sub-Division and Thannah boundaries, belonging to districts Dacca, Backergunge, Sylhet and Mymensing were prepared in this Office and forwarded to the Commissioner of Dacca, for his approval, in July last. The documents relating to the district of Mymensing have been returned by the Commissioner after examination. The map of Furreedpore being still with the Commissioner, boundary statements of that district cannot be made ready.

6. District maps of Bograh, Rajshahee, Muldah, Moorshedabad and Pubna, sent to the Commissioner of Rajshahee Division in May 1865, have been lately returned by him. Descriptive boundary statements of Sub-Divisions and Thannahs of the Rajshahee district are being compiled. Sub-Divisional and Thannah boundaries in some of the districts have not yet been agreed to by the local Officers. The maps of districts Dinagepore and Rungpore are still with the Commissioner.

7. Is on the whole satisfactory, but its efficiency is greatly impaired by sickness constantly obtaining amongst them. The head writer has done no work for the last six weeks. It is advisable that orders be issued prohibiting the acceptance, by heads of offices, of medical certificates from any but English Medical Officers, except in cases when the absentee can prove that he is unable to attend at a Government dispensary. This is a matter which deserves attention, probably all Officers suffer from the absence of their writers on insufficient pretexts causing continued obstruction to the work of their office. The Head Draftsman is a willing energetic man, and the second writer does his best to please his superiors.



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LISTS PREPARED.

1. Abstract Statements, shewing name, area, houses, &c., of each Thannah and Sub-Division of districts Sarun, Chumparun, Tihoot, Shahabad, Behar and Patna, have been prepared, printed, and distributed to the several local officers.

2. Proof Sheets of the detailed Lists of villages, appertaining to seventeen Thannahs of Zillah Tirhoot, have been examined, printed, and distributed to the different officers.

3. Original detailed lists of 13,156 villages of thirty-eight Thannahs, in the Dacca Division, viz:—

265 Villages of Thannah Putoakhallee.

218	..	of	..	Baophul	..	} District Bac- kergunge.
37	..	of	..	Goolsakhallee	..	
88	..	of	..	Teakhallee	..	
465	..	of	..	Suroopkatee	..	
379	..	of	..	Peerijpoo	..	
109	..	of	..	Mutbaree	..	
290	..	of	..	Lushkurgunj	..	
325	..	of	..	Burisaul	..	
309	..	of	..	Nulehitee	..	
162	..	of	..	Backergunge	..	
251	..	of	..	Mudareepoor	..	
315	..	of	..	Moolfutgunge	..	
117	..	of	..	Boorehatee	..	
395	..	of	..	Gournuddee	..	
153	..	of	..	Kotalcepara	..	
577	..	of	..	Julfurgunge.	..	} District Dacca.
820	..	of	..	Manikgunge	..	
297	..	of	..	Hurirampore	..	
269	..	of	..	Nawabgunge	..	
348	..	of	..	Sreenugur	..	
230	..	of	..	Naraingunge	..	
131	..	of	..	Dacca	..	
633	..	of	..	Sabhar	..	
351	..	of	..	Jamalpore	..	
264	..	of	..	Rajabaree	..	
787	..	of	..	Beydbazar	..	
429	..	of	..	Pulash	..	
291	..	of	..	Roypoora	..	
380	..	of	..	Bazeedpore	..	} Part of District Mymensing.
259	..	of	..	Nickley	..	
91	..	of	..	Pingna	..	
180	..	of	..	Dewangunge	..	
485	..	of	..	Sheypore	..	
528	..	of	..	Foolpore	..	
531	..	of	..	Doorgapore	..	
851	..	of	..	Naiterkona	..	
546	..	of	..	Jamalpore	..	

13,156

4. Descriptive Statements of boundaries of the following Sub-Divisions and Thannahs, viz:—

<i>Sub-Divisions.</i>	<i>Thannahs.</i>		
Manikgunge	... {	Jaffurgunge	..
		Manikgunge	..
		Hurirampoore	..
Dacca ...	... {	Nawabgung	..
		Sreenuggur	..
		Naraingunge	..
		Dacca	..
		Sabhar	..
Pulash ...	... {	Jamalpoore	..
		Rajabaree	..
		Beydbazar	..
		Pulash	..
Putookhallee	... {	Roypoora	..
		Putookhallee	..
		Baophul	..
		Goolsakhallee	..
Peerijpoore	... {	Teakhallee	..
		Suroopkatee	..
		Peerijpoore	..
Burisaul	.. {	Mutbaree	..
		Lushkurgunge	..
		Burisaul	..
		Nulchitee	..
Mudareepoore	... {	Backergunge	..
		Mudareepoore	..
		Moofutgunge	..
		Booreelatee	..
		Gournuddee	..
Jamalpoore	... {	Kotaleepara	..
		Dewangunge	..
		Sheyrpoore	..
Attia	.. {	Jamalpoore	..
		Pingna	..
		Mudhoopoor	..
Mymensing	... {	Attia	..
		Foolpoore	..
		Mymensing	..
		Mudargunge	..
Naiterkona	... {	Gulfargaon	..
		Doorgapoor	..
Kishoorgunge	.. {	Naiterkona	..
		Kishoorgunge	..
		Nickley	..
		Bazeedpoore	..

District
Dacca.

District
Backergunge.

District
Mymensing.

5. Original detailed lists of 2,714 villages of six Thannahs, belonging to the district of Monghyr, viz:—

Thannah Tegra	..	..	..	669 villages.
„ Bulliah	..	..	..	645 „
„ Gogree	..	..	..	382 „
„ Monghyr	..	..	..	540 „
„ Kurruckpoor	..	..	..	411 „
„ Chucky	..	..	..	34 „
				Total .. 2,714

6. Descriptive Statement of Moonsiffee boundaries in district Purneah, has been prepared and sent to the Government of Bengal, in accordance with the instructions contained in letter No. 5217, of the 13th September 1867 from Government.

MAPS PREPARED.

Scale 1 mile=1 inch.

1. Pergunnah and old Thannah boundaries have been marked and colored on a map of district Burdwan, and forwarded to the District Superintendent of Police.

2. Sub-Divisional boundaries have been marked and colored on two maps of district Dinagepore. One for the Commissioner of Rajshahee, and the other, for office use.

3. Maps of six Sub-Divisions belonging to the district of Jessore, with Thannah boundaries marked and colored thereon, for the Superintendent of Police.

4. Tracings of four Sub-Divisional maps, belonging to the district of Patna, with Thannah boundaries marked and colored thereon, for the Magistrate of Patna.

5. Tracings of fourteen Thannah maps, appertaining to the district of Patna, for the Magistrate of Patna.

6. Old and revised boundaries have been marked, on Maps of districts Nuddeah and 24-Pergunnahs, for the Commissioner of the Presidency Division.

Scale 4 miles=1 inch.

7. Revised Sub-Division and Thannah boundaries have been marked and colored on six copies of each of the Districts, Balasore, Cuttack and Pooree, for Mr. Geddes, Special Collector with the Commissioner of the Cuttack Division.

8. Sub-Division and Thannah boundaries have been marked and colored on two maps of District Jessore, one for the District Superintendent of Police, and the other, for the Collector.

9. Tracing of the Map of district Purneah, showing Sub-Division and Moonsiffee boundaries, for the Government of Bengal.

Scale 8 miles=1 inch.

10. Sub-Division and Thannah boundaries have been marked and colored on a map of Dacca Division; and a tracing shewing the Kooshtea and Comercolly Sub-Divisions and the Furreedpore district, has been prepared for Bengal Government, in accordance with the instructions contained in No. 5590, of the 6th December 1866, from Government.

11. Two maps of the Cooch-Bihar Division : one for the Commissioner, and the other for office use.

12. Sixteen maps of the Cuttack Division, showing new Sub-Division and Thannah boundaries : one for the Government of Bengal ; six for the Special Collector with the Commissioner of Cuttack ; six for the Famine Commissioner of Cuttack, and three for the Police Superintendent.

13. A map of the country south of the Ganges, shewing the different surveys of Bengal, the names of the Surveyors, the year and the Main Circuits.

14. Tracings of two maps : one shewing the districts included in the Patna and Bhaugulpore Divisions on the north of the Ganges River, the other shewing the districts included in the Patna and Bhaugulpore Divisions, with the Sonthal Pergunnahs, on the south of the Ganges. These maps were prepared for Mr. Cockerell, and both colored differently to shew the tracts where famine occurred in greater or less degree.

15. Tracing of a map of District Monghyr, shewing Sub-Division and Thannah boundaries, for the Commissioner of Bhaugulpore.

16. Tracing of a map of District Furreedpore, for the Commissioner of Dacca.

Scale 32 miles=1 inch.

17. Tracing of a map shewing the distribution of Judgeships in Bengal and Behar, for the Hon'ble Mr. L. Jackson.

18. Two maps shewing the Sub-Divisional arrangements in Bengal and Behar, since 1837 ; one for the Surveyor General, and the other for office use.

19. Two maps shewing the external boundaries of the British Territories within the Lieutenant Governorship of Bengal ; one for the Surveyor General, and the other for office use.

(True Extracts and Copies,)

J. Macdonald Major,
Officiating Deputy Surveyor General, Lower Circle.

