

G. Z. S. Litre

360

REPORT

ON THE

SURVEY OPERATIONS

FOR SEASON 1865-66,

FROM

1ST OCTOBER 1865 TO 30TH SEPTEMBER 1866.



CALCUTTA :

OFFICE OF SUPERINTENDENT GOVERNMENT PRINTING,

4, HASTINGS STREET.

1867.

No. 17.

FROM

LIEUT. COLONEL, J. E. GASTRELL,
Offg. Depy. Surveyor Genl. of India,

To

THE UNDER SECY. TO THE GOVT. OF INDIA,
Home Department.

Dated 13th December 1866.

SIR,

In accordance with the instructions contained in para. 4 of Orders, dated 2nd ultimo, No. 462, I have the honor to submit "a General Report, containing a brief review of the entire operations of the Department," Revenue Branch, for the year 1865-66.

2. Copies of the several local Reports, prepared and submitted to each local Government and Administration, are also as directed, given in Appendix.

3. The distribution of the several survey parties, and the names of the Officers superintending each, are as follows:—

Central Provinces, 1st Division, Districts Hooshungabad and Seonee...						Captain R. E. Oakes.
Ditto, 2nd " " Raepore					}	Lieut. J. W. Taylor and Captain J. Macdonald.
Ditto, 3rd " " Dumoh						Lieut. J. H. W. Osborne.
Ditto, 4th " " Chanda						Captain J. Macdonald.
Oudh, 1st Division, District Mohumdee... ..						Major F. C. Anderson.
" 2nd " " Hurdui and Baraitch						Captain A. D. Vanrenen.
North-West Provinces, Rampoor Jagheer and Kumaon Tea Estates						Mr. J. Campbell.
Punjab, District Hazara						Lieut. Colonel H. C. Johnstone.
Sindh, " Hyderabad						Mr. W. Lane.
Bengal, 1st Division, District Kamroop						Mr. R. B. Smart.
" 2nd " " Manbhoom						Captain D. Macdonald.
" 3rd " " Sylhet and Cachar						Mr. N. T. Davey.
" 4th " " Tirhoot, Patna, &c.						Lieut. W. J. Stewart.
" 5th " " West Dooars and Chittzong						Mr. J. H. O'Donel.
" 6th " " Lohardugga						Major G. H. Thompson.
" Darjeeling Revenue and Topographical Survey	}	"	{	Darjeeling, Dalimkote Sub-Division, and Western Dooars	}	Mr. E. T. S. Johnson.
" Upper Assam ... ..						"	Scebsaugur ... ..	{	Messrs. C. Brownfield and H. B. Talbot.

4. The results obtained by each party, and the general average rates per square mile and per village circuit, are given in the following Tabular Statement:—

GENERAL RETURN of Professional Work for Season 1865-66, exhibited by

DIVISIONS AND SUPERINTENDING OFFICERS.	Names of Districts.	
<i>1st Division, Central Provinces.</i>		
Captain R. E. Oakes, Revenue Surveyor	{ Hoshungabad ... Mandla ... Seouce ...	... ..
<i>2nd Division, Central Provinces.</i>		
Lieutenant J. W. Taylor, Assistant Revenue Surveyor in charge ...	Raepore ...	... ..
<i>3rd Division, Central Provinces.</i>		
Lieutenant† I. H. W. Osborne, Assistant Revenue Surveyor in charge	Dumoh ...	... ..
<i>4th Division, Central Provinces.</i>		
Captain J. Macdonald, Revenue Surveyor	Chanda ...	... ..
<i>1st Division, Oudh.</i>		
Major F. C. Anderson, Revenue Surveyor	{ Shahjehanpore ... Mohumdee ...	... ..
<i>2nd Division, Oudh.</i>		
Captain A. D. Vanrenen, Revenue Surveyor	{ Hurdui ... Baraitch ...	... ..
<i>North-Western Provinces,—Rohilcund.</i>		
J. Campbell, Esq., Assistant Revenue Surveyor in charge	{ Rampore ... Kumaon ... Gurhwal ...	... ..
<i>Punjab, North-West Frontier.</i>		
Lieutenant Colonel H. C. Johnstone, Revenue Surveyor... ..	Hazara ...	... ..
<i>Sindh.</i>		
W. Lane, Esq., Revenue Surveyor	{ Mohomed Khan's Tanda ... Hydrabad ... Oomerkot ...	... ..
<i>1st Division, Lower Provinces.</i>		
R. B. Smart, Esq., Revenue Surveyor	Kamroop ...	... ..
<i>2nd Division, Lower Provinces.</i>		
Captain D. Macdonald, Revenue Surveyor	Manbloom ...	... ..
<i>3rd Division, Lower Provinces.</i>		
N. T. Davey, Esq., Revenue Surveyor	{ Sylhet ... Cachar ...	... ..
<i>4th Division, Lower Provinces.</i>		
Lieutenant W. J. Stewart, Revenue Surveyor	{ River Ganges, through Tir- hoot, Patna, and Monghyr	... ..
<i>5th Division, Lower Provinces.</i>		
J. H. O' Donel, Esq., Revenue Surveyor	{ Chittagong ... Western Dooars ...	... ..
<i>6th Division, Lower Provinces.</i>		
Major G. H. Thompson, Revenue Surveyor	Lohardugga ...	... ..
<i>1st or Darjeeling Division, Revenue and Topographical Survey.</i>		
E. T. S. Johnson, Esq., Assistant Revenue Surveyor in charge ...	{ Darjeeling and Hills Western Dooars	... ..
<i>2nd or Upper Assam Division, Revenue and Topographical Survey.</i>		
H. B. Talbot, Esq., Assistant Revenue Surveyor in charge ...	Sebsaugor ...	... ..

5. There is a falling off in area when comparing this year's results with those of the past, but the strength of the establishment has been reduced by two parties, one the 3rd Division, Oudh, and the other the 3rd Assam Revenue and Topographical Survey. Other causes have also operated, as detailed in the reports appended, which have materially decreased the returns of the 2nd Division, Central Provinces, to half, and that of the 3rd Division, Bengal, to less than one-third of the area ordinarily turned out by a full party. The area also of the Rohilcund party in the North-West Provinces was very small, owing to there being no more work ready in the plains. The return of the Sindh party, though very large indeed, 3,005 square miles, did not reach the same figure as last year by 1,300 square miles, owing to a smaller portion of sandy desert being included. Similarly the area of the 1st Division, Bengal, was swelled beyond average in 1864-65 by the large area of Rivers and Estuaries included in that year's Survey. Again, the country now under survey in the Central Provinces, Assam, Cachar, Hazara, and the Bengal Dooars, is very much more difficult to deal with than the more fertile tracts that have already been surveyed; and the impossibility in many parts of obtaining measurers, who form the bulk of the field establishment, at the small rates of pay, Rs. 3-8 and Rs. 4, at which they could in former days be readily obtained, re-acts on the area by forcing surveyors to curtail their establishments to keep within Budget Estimate. Lastly, the comparison, now strictly enjoined, of the separate areas of fallow, cultivation, and waste with the settlement areas, though very greatly increasing the value of the survey, decreases the annual area in the field. The following figured abstract accounts for the deficit in area—which is above explained, shows that, with exception of the parties indicated, the others have all done an average season's work as usual:—

Decrease in area by 1 full party abolished	1,100
" 1 Waste Lands party	350
" 2nd Division, Central Provinces	550
" 1st " Bengal	1,000
" 3rd " Bengal	700
" in Sindh	1,300*
" in North-West Frontier completed work	1,400*
	6,400

6. During the past season the rise in price of provisions rendered it necessary, in several localities,† to grant survey parties special allowances, as sanctioned in the Resolution of Government of India, Financial Department, No. 70‡, dated 22nd February last. The Surveyors in such localities have done well in keeping the rates to the lowest figure under such contingencies.

* These two parties have less completed work to show, but have done 2,553 square miles of Triangulation. The survey of Hazara is also peculiarly intricate and difficult.

† In Assam and in Central Provinces.

7. The following Statement shows the total area, cost, and average rate per square mile of districts of which the survey has been completed since the last Report :—

Statement showing the area, cost, and rate per Square Mile of the Districts in Oudh and North-West Provinces, the survey of which has been completed, in continuation of Statement H of last Report.

DISTRICTS.	When commenced to be surveyed.	When finished.	By whom surveyed.	AREA IN		Cost, inclusive of Contingent Expenses.	Rate per Square Mile.
				Acres.	Square Miles.		
	Season.	Season.					Rs. A. P.
District Hurdul	1863-64	1865-06	Lieut. Colonel D. C. Vanrenen ...	14,97,785	2,289	68,652	38 10 7
Large scale Village Survey... ..			Captain A. D. Vanrenen				
Rampore Jagheer	1864-65	1865-86	H. B. Talbot, Esq.	5,74,232	698*	10,800	22 1 10
Topographical Survey			J. Campbell, Esq.				

* This includes $6\frac{1}{2}$ square miles of Districts Moradabad and Bareilly.

8. DEMARCATIIONS.—Generally speaking the demarcations have been well prepared in advance of the survey, the Thakbust maps are spoken well of, and the agreement of settlement and professional boundaries are reported very good. The chief exceptions are those to which Colonel D. C. Vanrenen, Officiating Superintendent of Surveys, Bengal, has already drawn the attention of the Bengal Government in Assam and Manbhoom; and the state of the boundary between Oudh and the North-Western Provinces, to which attention is drawn in the Oudh Report, and copy of which has been forwarded to the Government of the North-Western Provinces.

9. GOVERNMENT WASTE LAND.—In my Report on 1st Division, Central Provinces, I have noticed an excellent plan which has been adopted in the Central Provinces of marking off all waste lands requiring sub-division into rectangular blocks. These will be numbered consecutively on the maps, whilst corresponding numbers will be marked on the face of the masonry or stone pillars which are placed diagonally at each corner of the blocks. This plan will afford great facilities both to intending purchasers in selecting, and to the District Officers in allotting, either whole, or portions of blocks as may be desired. This will, I think, quite prevent the confusion that must arise, where, as is often the case, the applicants and district authorities are alike ignorant of the exact site and limits of the lands applied for.

10. SURVEY LINES FORM THE BOUNDARIES.—Another excellent feature in the plan is, that of adopting the professional survey lines as boundaries of blocks from pillar to pillar, wherever the limits have not already been determined and marked off by the Settlement Officers.

11. RECOMMENDS GENERAL ADOPTION OF ABOVE.—The same simple but effective system might be adopted with great advantage throughout India,

wherever extensive tracts of Government waste lands are available, and I beg to recommend it for consideration and adoption.

12. RECORDS AND PLANS.—Up to date, only a portion of the records, maps, and plans of the several surveys have been received in this Office. This is unavoidable. Commencing field work annually from middle of October to middle of December, according to the nature and peculiarity of the climate, &c., of the part of India in which each party is employed, and retiring from the field from April to June, a full season's field work cannot, as a rule, be calculated, mapped, and rendered by any party before it is ample time again to take the field. All the records cannot therefore, on this account alone, reach this Office before the end of the year. Another reason of delay, even when Surveyors are working in the same district, and take, and retire from, the field together, and when the out-turn is the same or nearly so, is the fact that it takes more time to survey, calculate, and map 1,000 square miles in a hilly, close, and jungly country, with cultivation in patches in every direction, than 1,400 in a clear and well cultivated one.

13. Then comes the examination in this Office, which continues uninterruptedly until May or June, or even later. I am not therefore in a position to report on them further than to say that those which have been received and inspected reflect great credit upon the respective surveys furnishing them.

14. Great pains have been bestowed to adapt them to present wants and requirements; and any of those received are capable, on an urgent call being made for them, of immediate reproduction, line for line, by photography; subsequent printing by the photo-carbon process on stone, or on zinc, and issue within a few days of the call being made. This is an advantage which but a few years ago did not exist, and was not possible with maps prepared in colors.

15. The out-turn of mapping for the past season, either received by, or en route to this Office, for examination and subsequent reduction and compilation on the general maps, represents an aggregate area of square miles 15,000.

16. DRAWING OFFICE, REVENUE BRANCH.—The general and other maps in hand, or completed, in the Revenue Branch since last report, which brought up the state of the Drawing Office to the end of April 1866, are as follows, viz. :—

Revenue Survey, Drawing and Compiling Branch.

	Title of Map.	Scale.		REMARKS.
		Miles.	Inch.	
Lower Prov. Inces.	Districts Tipperah and Noacolly ...	4	1	Completed and photographed for issue to Government Officials.
	„ Sylhet	4	1	Near completion.
	„ Chittagong with the Hill Tracts	4	1	Completed and photographed; copies issued to Government Officials.
	„ Manbhoom	4	1	In progress; half completed.

Revenue Survey, Drawing and Compiling Branch,—continued.

Title of Map.	Scale.	REMARKS.
	Miles. Inch.	
Central Provinces, { District Nursingpore	4 1	Completed and sent to press.
{ „ Bhundara	4 1	More than half completed. Suspended.
Oudh, in 4 Sections, Sheet No. 1	4 1	Containing Districts Scetapore, Hurdui, and Mohumdee compiled as far as survey materials have been received. Writing in progress.
Sindh, Kurrachee Collectorate	4 1	Containing Districts Kurrachee, Schwan, and Jhirruck, partly out lined.
Lahore District, showing village boundaries	2 1	Completed. The 1st edition of this map having been exhausted, and the demand for it very great, a new map has been specially prepared for reproduction by Photography.
Delhi and Hissar Divisions, with village boundaries	2 1	In progress. This map also contains the lapsee Jagheers and Native States adjoining British Districts.
Saugor District, in 2 Sections, with village boundaries	2 1	Half completed.
Sylhet, in 12 Sections	1 1	Standard sheets projected and outlined. Sent to press.
24-Pergunnahs, in 8 Sections	1 1	Two Standard sheets projected and outlined. The entire map is now going through press.
Oudh, in 53 Sections	1 1	Seven Standard sheets projected and outlined; others in progress.
Sindh, in 99 Sections	1 1	Standard sheets under projection. Each section 20' of Latitude by 30' Longitude.
<i>Miscellaneous Maps, Tracings, &c.</i>		
Map of the Saugor District, showing village boundaries and waste land	2 1	Two copies on tracing cloth.
Plan of Howrah	1 1	Reduced for insertion on the large scale map of 24-Pergunnahs.
„ of Allahabad	1 1	Reduced for insertion on the large scale map of Oudh.
Pergunnah Kurrabaree, District Bhaugulpore	1 1	Copy for Collector.
22 Plans of portions of the River Jhelum, in District Shalpoore	1 4	Prepared for the Deputy Commissioner.
Pergunnah Futteahbad, District Midnapore	1 1	Tracing for the Collector.
13 Sheets of Villages, District Chittagong	1 4	For the Collector.
62 Proofs examined	Various.	Of maps going through press.
1,091 Lithographed maps colored	Various.	For issue to Government Officials and sale. The greater number of these are large scale maps.

In addition to the above, several tracings of boundaries, &c., have been furnished to Surveyors, and other miscellaneous and desultory work of various kinds completed.

17. DEMAND FOR VILLAGE AND LARGE SCALE PLANS INCREASING.—Until lately, the Revenue Survey large scale plans, on 20 chains to the inch, or 4 inches to the mile, have been comparatively but little known or used, except for Revenue purpose, and indeed, until the introduction by the Surveyor General, Colonel Thuillier, of the system of mapping on each large imperial sheet of paper as many villages as the sheet can contain, these plans were not easily made available for other than mere Revenue purposes. In fact they subserved but one purpose. Since then, however, the demand has steadily increased, and as evidence of the estimation in which these plans are beginning to be held by the Officers of the Public Works Department, it may be mentioned that Colonel Short, Superintending Engineer of the Presidency Circle,

lately called for and obtained a complete map on the scale of 4 inches==1 mile of the country on the left bank of the Damooda River from the junction of the Damooda and Barakar Rivers to Raneegunj, and of the entire line south of the Railway from Raneegunj to Howrah, making a total length of 143 miles. Mr. Hughes, Assistant Engineer, in charge of the new road between Byram Ghât and Baraich in Oudh (a distance of 40 miles), has applied for copies of large scale plans, of the country lying two miles on either side of the line of road. Similar plans of the Ghogra River and country on its right bank were not long ago furnished to the Engineer in charge of the Ghogra River Works; whilst the Engineer in charge of the Mithrow Canal and its branches in Sindh acknowledges the great aid he has received from the Revenue Survey Maps of the Thurr and Parkur (Vide Sindh Report). Every effort has been, and will be, made to meet such demands, and thereby save the Government the expense and time lost in making special preliminary surveys.

18. RECOMMENDS LEVELLING IN CONJUNCTION WITH SURVEY OPERATIONS.—The value of the Revenue Survey Maps would, however, be greatly enhanced both for Public Works and for Geological purposes if lines of levels were run simultaneously with the Survey, and the results incorporated on all our maps. Questions relating to irrigation, road-making, railways, &c., would thus be far more readily dealt with by Engineers, and all such projects could be prepared and laid before Government much more speedily and economically than at present, inasmuch as the necessity for all preliminary and partial surveys as feelers would be entirely obviated.

19. APPROXIMATE COST OF LEVELLING.—I am of opinion that one Levelling Party attached to each of the Survey Establishments would be ample for the end in view. The cost would not, I apprehend, exceed Rs. 1,000 per annum for each, and the saving would eventually be many times that amount.

20. DRAWING BRANCH—MANUSCRIPT PLANS.—Manuscript copies of 180 village plans have been supplied to landholders, and numerous requisitions for copies of maps on smaller scales have also been complied with. Work of this nature has been performed out of Office hours, or by extra labor, and the payments made by applicants on this account amount to Rs. 2,001-12-0 for the past eight months.

21. Hitherto the most serious obstacle to the preparation and free circulation of plans on so large a scale, and containing complete details, has been the expensive and laborious process of copying by hand, but this difficulty is avoided on all our present maps, which are now prepared, without the use of color, entirely in pen and ink, with the special object of reproduction to scale, or reduction, as may be necessary, by Photography, and subsequent transfer to stone or zinc by the carbon process.

22. STAMPS AND PUNCHES, TYPE FOR TITLES, &c., FOR LARGE SCALE REVENUE SURVEY PLANS.—Attention has long been given to the introduction of

Stamps and Punches for Topographical items and conventional signs, and Type for titles, headings, and foot-notes of the large scale village plans, so as to reduce the amount of manuscript drawing performed by our, at present hard worked, survey parties in preparing duplicate and triplicate copies for the use of local Governments and Civil Officers. Through the kindness of Colonel Ballard, c. b., Officiating Mint Master, a set of 32 dies have been engraved and stamps obtained, which are now undergoing trial and slight alterations. I hope very soon to be able to supply each survey party with complete sets of these stamps, to be used with small hand presses similar to those used in the Ordnance Map Office, Southampton.

23. Type of various kinds suitable for titles, foot-notes, large lettering of names of towns, &c., have already been partially issued, and supplies of such descriptions as were not at present procurable in India have been ordered.

24. By such mechanical aid, the large scale plans, which have hitherto been completed at a heavy outlay of time and labor, will be produced with comparative ease, uniformity of style will be secured, more time be gained for the preparation of the finer descriptions of maps; and a smaller number of hands being required in Office, more money will be available to spend in the field. Every exertion will be made to obtain the fullest returns for the annual outlay.

25. The many changes that have taken place in the organization of the Department since survey operations were first commenced in India rendered it essentially necessary to prepare a new Hand Book for the guidance of the Executive Branch. To this my earnest attention has been given during the past year. The duty of compiling the new Code from the old materials was entrusted by me to Captain Sconce, Revenue Surveyor, who has most ably and efficiently performed his task.

26. I propose shortly to submit the compilation to the Surveyor General for approval, and for submission to the Government of India for final sanction and adoption in the Revenue Survey Branch of the Great Survey of India.

27. I am well pleased with the manner in which I have been assisted in the duties of the Head Quarters Office, in the Drawing and Computing, and in the Correspondence and Audit Branches, and am especially indebted to Messrs. James and Adels, the Head Assistants of those Branches.

I have the honor to be,

SIR,

Your most obedient Servant,

J. E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

No. 12.

FROM

THE OFFG. DEPY. SURVEYOR GENERAL OF INDIA,

TO

THE SECY. TO THE GOVT. OF INDIA, HOME DEPARTMENT.

Dated 6th December 1866.

SIR,

Under instructions contained in para. 4 of Orders No. 462, dated 2nd ultimo, I have the honor to submit the accompanying Report on the Revenue Survey Operations of the 1st, 2nd, 3rd, and 4th Divisions, Central Provinces, during the season 1865-66.

2. The results of the operations of the four parties attached to the Central Provinces are embodied in the following Statement:—

Central Provinces Survey Divisions.	District in which employed.	No. of Villages or Waste Land Blocks.	Square Miles.	Total Expenditure.	REMARKS.
1st Division ...	Hoshungabad and Seonce ...	573	a 1,282	Rs. 57,632	a.—Includes area of Jubbulpore and Nursingpore Stations and Cantonnments on large scale. Jubbulpore 10.47 | = 14.65 square Nursingpore 4.18 | miles.
2nd Do. ...	Raepore ...	349	b 554	49,027	b.—Only half a season's work, the survey of the Pergunnahs Balod and Sunjaree having been rejected. <i>Vide</i> body of Report.
3rd Do. ...	Dumoh ...	562	c 1,058	45,077	
4th Do. ...	Chanda ...	553	905	54,137	c.—Includes area of Saugor Cantonnments = 17.16 square miles.
Grand Total for 1865-66 ...		2,037	3,799	2,05,873	Average per square mile Rs. 54, and per village 101.
Grand Total for 1864-65 ...		1,927	4,193	1,98,619	Average per square mile Rs. 47, and per village 103.
		+ 110	— 413	+ 7,254	

3. The slight falling off in area is more than accounted for by the small amount of work accepted for the 2nd Division, Central Provinces.

4. Considering that compensation, on account of excessive dearness of provisions, had to be granted to the several survey parties as per margin, whereby the cost of these parties was considerably increased, and the small

1st Division—During Recess at Jubbulpore.
2nd Division—During Recess at Kamptee only.
3rd Division—*Nil*.
4th Division—During Field and Recess at Kamptee.

out-turn of the 2nd Division, the results are good, and contrast well with those of the former year.

5. The following maps have been published of the Central Provinces during the past year, *viz.* :—

Index map of the Central Provinces in 4 sections, scale 16 miles = 1 inch.

Pergunnahs Nursingpore, Sreenuggur, Buchae, and Chawurpatha, of District Nursingpore.

Two main circuit maps of Jubbulpore District.

Pergunnahs Ambagurh, Bhundara, Sahungurhee, and Thirora, of District Bhundara.

Pergunnah Mangurh, of District Dumoh.

Plan of the Cantonment of Kamptee and City of Nagpore.

6. Several maps of the Bhundara District (2nd Division, Central Provinces) are also on stone, but must remain unpublished for the present.

7. Compilations of the following districts are in hand, *viz.* :—

Nursingpore, scale 4 miles = 1 inch, completed, and sent to Press.

Bhundara, scale 4 miles = 1 inch, suspended.

Saugor, scale 2 miles = 1 inch, with village boundaries, in progress.

I have the honor to be,

SIR,

Your most obedient Servant,

J. E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

GENERAL REPORT
ON THE
REVENUE SURVEY OPERATIONS
OF THE
CENTRAL PROVINCES.

For Season 1865-66.

FIRST DIVISION, CENTRAL PROVINCES.

COMMENCEMENT OF WORK.—The Establishment took the field on the 15th November 1865 and entered upon the survey of Pergunnah Luknadow, which forms the northern portion of District Seonee, leaving Pergunnah Charwa and Seonee of District Hoshungabad to be taken up at a later period when the jungle tracts in that district could be entered with safety. The two last named Pergunnahs complete the plains portion of District Hoshungabad lying between the River Nerbudda and the Sathpoora Range, except a small tract lately transferred from District Chindwara. The positions of Pergunnah Charwa (Tehseel Hurda) and of Pergunnah Seonee (Tehseel Seonee) are described in paragraphs 28 and 33 of Appendix. The former contains 21 villages, aggregating 27 square miles, but the main portion consists of waste land which the Surveyor says has, in compliance with the wishes of the Civil Authorities, been divided into rectangular blocks, which have been numbered consecutively on the map. Corresponding numbers will be painted upon masonry pillars placed diagonally at each corner, thereby offering a ready means of identifying in the field, any of the blocks by a glance at the map. This plan of marking blocks of waste lands is an excellent one, and I would strongly urge its adoption throughout India for all lands not yet allotted to land-owners. By this means all tortuous boundaries, except in cases where streams, &c. offer permanent and natural limits, all tortuous boundaries would be avoided, and the expenses of survey be greatly lessened, and many boundary disputes be avoided in future, or, if raised, be as easily dealt with.

2. AREA OF WASTES.—In the absence of settlement boundaries, the survey lines skirting waste blocks are accepted by the Settlement Officer as boundaries. Pergunnah Charwa contains 71 waste land blocks, whose area is 398 square miles, making the total area of the Pergunnah 425 square miles. Pergunnah Seonee contains 39 villages = 68 square miles, and 23 waste land traverse circuits = 61 square miles.

3. DISTRICT SEONEE.—The District of Seonee lies immediately south of those of Jubulpore and Mandla, the Nerbudda River separating it from the latter. On the west are Districts Nursingpore and Chindwara; on the south the unsurveyed portions of Tehseel

Luknadow; on the east is District Mandla. The tract surveyed in Seonee contained 431 villages, and an area of 714 square miles.

4. The total out-turn of the season in both Districts, Hoshungabad and Seonee, is 1,282 square miles, containing 585 village and waste land circuits. The villages and waste lands were much interlaced, and the entire area was accordingly surveyed in detail on the full scale of 4 inches = 1 mile.

5. The station, city, and environs of Nursingpore were also re-surveyed on the scale of 8 inches = 1 mile.

6. CITY AND STATION OF JUBBULPORE.—The survey of the city and environs of Jubbulpore is now in progress, on the scale of 8 inches = 1 mile, while the station, including the houses of the Military and Civil residents, has been minutely surveyed on the scale of 16 inches = 1 mile. This work, the Surveyor reports, will be completed by the end of the season.

7. CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.—The work in District Seonee is based upon two principal stations* of the Jubbulpore Meridional Series lying within the district, the direct distances between which, deduced from Great Trigonometrical and Revenue Survey data, are given below :—

* Munda.
Kusumbarra.

From	To	By Great Trigonometrical Survey—In feet.	By Revenue Survey—In feet.	Error per mile in feet.
Munda ...	Kusumbarra..	82,247·21	82,305·31	+ 3·72

8. JUNCTION WITH NURSINGPORE.—The survey was still further checked, and a good junction effected with the Nursingpore District, by connecting two secondary stations† of the series (lying in District Nursingpore) with the Seonee Main Circuit.

† Surra.
Rangarha.

9. CONNECTION WITH HYDERABAD TOPOGRAPHICAL SURVEY.—In Hoshungabad only two stations of the Hyderabad Topographical Survey were found within reach of Revenue Survey Triangulation, but several‡ masonry platforms have been erected by the Revenue Surveyor along the southern face of the Charwa Main Circuit, in prominent positions, about a mile within the circuit, and duly connected with it, to enable the Topographical Surveyor, deputed to survey the Sathpoora Range, to connect his work with that of the Revenue Survey.

‡ No. 1 near Chowtulla. { No. 5 near Khotwalia
" 2 " Kharee. " 6 " Dhakochee.
" 3 " Asaree. " 7 " Kowtha.
" 4 " Khotwalia.

Points 6 and 7 are without the circuit, but within a convenient distance for connection.

10. DEMARCATION.—The Surveyor reports having experienced some difficulty in the boundary survey owing to defective demarcation, but states that the omission of land-marks were caused by inattention on the part of Malgoozars to the orders of the Settlement Authorities, "whose maps with few exceptions were correctly drawn." In some instances double lines of old and new pillars gave trouble also, but the Surveyor bears testimony to the prompt assistance rendered by Settlement Officer, through whose hearty co-operation the comparison between the Professional and Hudbust maps was completed before leaving the field.

11. CHECK ON INTERIOR WORK.—The interior work was checked by the European Assistants, and a comparison instituted in the field by the Revenue Surveyor, between these check lines and board plans, is reported as most satisfactory; only a few trifling discrepancies having been perceptible in the items of cultivation and fit for cultivation, which were satisfactorily accounted for, says the Surveyor, "by the interval which elapsed between the survey 'and the purtal (or check)', during which certain patches appear to have been brought under cultivation.

12. MAPS.—The main circuit maps of the season have been received and are got up very carefully and neatly in every respect.

13. ASSISTANTS.—The Surveyor speaks highly of all his Assistants, except one. Mr. F. Grant, Assistant Revenue Surveyor, is specially commended for the forethought evinced by him during the time he was on detached duty in District Hoshungabad, and the success with which he accomplished a difficult task.

14. GOVERNMENT FOREST RESERVES.—It was contemplated to take up the survey of the Government Forest Reserves alluded to in paragraph 45 of the last Report, but the Forest Department has since decided to wait until the forest tracts are taken up in regular course of survey. The Surveyor will thus be saved the inconvenience of scattering his party for the survey of isolated patches of country. The party again took the field on 21st November for the survey of Pergunnahs Luknadow and Seonee of Pergunnah Seonee, lying immediately south of the tract above reported upon.

15. Part of the boundary between Hoshungabad and Chindwara having been, as already mentioned, altered by the transfer of some villages from the latter to the former, the Surveyor has been directed, in case the demarcation is complete and the Thakbust maps in hand, to take up the survey of the transferred villages and thus complete the plains portions of Hoshungabad this season, if possible.

16. STATISTICS.—A description of the country surveyed in the season under review will be found in the Appendix.

SECOND DIVISION, CENTRAL PROVINCES.

17. WORK OF THE SEASON.—The field season of this party extended from the middle of November 1865 to the middle of May 1866, or

Lieutenant J. W. Taylor, Staff Corps, Assistant Revenue Surveyor, in charge.

ASSISTANTS.

Lieutenant J. E. Sandeman, General List, Assistant Revenue Surveyor, transferred to 2nd Division, Oudh, on the 17th February 1866.

Mr. W. Ellison, Assistant Revenue Surveyor, 1st Class.
Mr. P. M. Brennan, Sub-Assistant ditto, 1st "
Mr. W. S. Huttress, ditto ditto ditto, 2nd "
transferred from 2nd Division, Oudh, on 22nd June 1866.

Sergeant J. Newland, Probationary Sub-Assistant Revenue Surveyor, 3rd Class.

Corporal W. Bourne, Probationary Sub-Assistant Revenue Surveyor, 3rd Class.

34 Native Surveyors.

1 Sunjaree Pergunnah. six months in all. During this period the five
2 Balod " " Pergunnahs of the Rae-
3 Patun " " pore District marginally
4 Nawgurh " " noted were commenced, and the survey of three
5 Deorbejah " " last completed ~~satisfactorily~~. The measurements
and calculations of Pergunnah Sunjaree had to be rejected on account of inaccuracies; whilst the survey of Balod, having been erroneously

commenced before the demarcations were complete in any way, was abandoned under orders from this Office, as soon as the fact was disclosed.

18. AREA.—The completed area amounts, therefore, to only 55½ square miles, comprised in 349, village and one river (Seonath) Circuit.

19. Pergunnah Patun lies to the south-east of Pergunnah Doorroog, surveyed in 1864-65,

C

* N.B. This work has still to be tested in the field before being finally passed.--

and about 32 miles south of Pergunnah Nawagurh and Deorbejah, which lie immediately to the east of Pergunnah Khyragurh, also surveyed in 1864-65.

20. DESCRIPTION OF COUNTRY.—This part of Raepore is reported as open and fertile, and the Pergunnahs of Nawagurh and Deorbejah to be particularly rich in cultivation and well watered by numerous streams.

21. DISCREPANCY IN WORK.—In my last Annual Report I mentioned certain discrepancies having been discovered in the work of season 1863-64, and that explanation had been sought regarding them. The lengthened investigation which this discovery led to, and which was most ably and efficiently carried out, under the orders of this Office, by Captain J. Macdonald, Revenue Surveyor, 4th Division, Central Provinces, proved, I regret to say, the untrustworthiness of that season's work, and the necessity for an entirely new survey of the portion of the country then surveyed.

22. Pursuing the investigation, doubts have also arisen regarding parts of the work of 1864-65. A careful field examination will, however, be necessary ere definite and final opinion can be passed upon it. This will be undertaken this year, as soon as Mr. Robert Smart, Revenue Surveyor, who has been appointed to the charge of this party, has joined. Mr. Smart is now en route. He is an Officer of great experience, and well qualified to undertake the duty which has been entrusted to him of re-organizing this party.

23. I trust that the close of the present season will once more see this Division of survey thoroughly efficient, and again able to compete with the other surveys of India.

24. The whole circumstances connected with the rejected work of this party having been fully detailed in the correspondence with Government, marginally noted, it is needless to dilate on it in this Report.

No. 2, dated 13th October 1866, to Secretary to Government of India, Home Department.

THIRD DIVISION, CENTRAL PROVINCES.

25. COMMENCEMENT OF WORK.—The field establishment assembled at Saugor on 1st November 1865, and by the end of the first week in that month, operations were fairly started in Tehseel Hutta, of District Dumoh.

Captain J. Sconce, R. A., Revenue Surveyor, returned from leave—on duty in Presidency Office.

Lieutenant J. H. W. Osborne, late 44th N. I., Assistant in charge.

ASSISTANTS.

Lieutenant D. C. Andrew, Staff Corps, Assistant Revenue Surveyor.

Mr. H. L. Pemberton, Assistant Revenue Surveyor, 3rd Class.

Mr. J. S. Pemberton, Sub-Assistant Revenue Surveyor, 2nd Class.

Mr. A. Lawson, ditto ditto ditto.

Mr. J. H. Barter ditto ditto 3rd ditto.

Mr. C. Seyers, Junior Sub-Assistant Revenue Surveyor.

80 Native Surveyors.

26. POSITION OF TRACT.—The survey was confined almost entirely to the Hutta Tehseel, which is bounded on the north by the Punnah, Chutterpore, and Adjygurh States; on the south by Tehseel Dumoh; east by the Punnah State and District Jubbulpore; west by the Punnah State and District Saugor. It lies between the parallels of 23°50' and 24°30' North latitude, and meridians of 79°23' and 79°55' East longitude.

27. AREA.—The area is 1,041 square miles, divided into 562 villages, inclusive of 5 small detached and outlying portions of Punnah.

28. SAUGOR CANTONMENTS.—The City, Cantonments, Civil Station, and Suburbs of Saugor were also surveyed on the large scale of 8 inches = 1 mile, the area of which, exclusive of the suburbs, is 17 square miles.

29. **GREAT TRIGONOMETRICAL SURVEY CHECK.**—A few old stations of the former survey of Saugor were met with, and afforded the means of making a good junction between the two surveys. Three stations* of the Calcutta Longitudinal Series were also met with and closed upon in course of this season's operations. The result of comparison of direct distances between these points as deduced from Great Trigonometrical and Revenue Survey computations and measurements cannot be given, as the records have not been received.

* Nyagaon.
Badshapora.
Gopalpore.

30. **DETAIL SURVEY.**—The detail survey was thoroughly checked by European Assistants. The Surveyor remarks, "Purtal or check lines were everywhere taken through villages from one extremity to another" of the tract under survey.

31. **DEMARCATIONS.**—The field demarcations are reported to have been in a very complete and satisfactory state:—"The village boundaries of the District are very well defined, long oblong stones being firmly embedded in the ground at each angle of the boundary, and almost every village tri-junction is marked by a small square masonry platform."

32. **THAKBUST MAPS.**—The Thakbust maps were carefully prepared and made over to the Surveyor in good time. The comparison between the Professional and Settlement Maps, the Surveyor reports, "gave very good results."

33. **KHUSREH SURVEY.**—The Khusreh measurements had been completed some time prior to the commencement of the Professional Survey, and the Settlement of the Tehseel had also, it is believed, been finished; the submission of detailed areas monthly to the Settlement Officer for comparison with the Shujreh Returns was not necessary.

34. **MAPS.**—The main circuit Maps have been received in this Office, and are very artistically and carefully executed. A few marginal sketches, showing the peculiar formation of the raised plateaus, the water-falls that descend from them to the plains below, and other remarkable features have been well executed by the Assistants, and add greatly to the value of the maps.

35. **ASSISTANTS.**—With one exception, the Surveyor reports favorably of his Assistants, and especially mentions Lieutenant Andrew and Messrs. H. Pemberton and Lawson.

36. **DUMOH DISTRICT COMPLETED.**—The survey of Tehseel Hutta completes District Dumoh, the total area of which proves to be 2,510 square miles, contained in 1,255 villages.

37. **WORK FOR 1866-67.**—**DISTRICT BIJERAGOOGURH.**—As noticed in Deputy Surveyor General's Report for 1864-65, paragraph 76, the survey of District Bijeragoogurh will now be taken in hand, and as the estimated area (650 square miles) is not enough to occupy the party the whole season, its resources will, in compliance with the request of the Chief Commissioner, be turned to account in surveying the boundaries

Forest Reserves in Saugor.

of the newly demarcated Government reserves in the Saugor District and in re-adjusting the areas, and correcting the maps of the former village survey of that District.

38. There are altogether 344 waste land plots, the estimated area of which is about 800 square miles. The Surveyor has received full instructions how to proceed with the survey of these blocks, and as all the triple-junctions in the Saugor District are permanently marked by stone or masonry platforms, there should be no difficulty either in surveying the forest reserves or combining the old and new surveys, and eliminating the area of each plot from the village containing it.

39. STATISTICS.—Full extracts from the Surveyor's Report, descriptive of the country under survey, its productions, facilities of communication, &c., &c., will be found on reference to Appendix.

FOURTH DIVISION, CENTRAL PROVINCES.

49. FIELD OF SURVEY.—Field operations were resumed early in November in District

Captain J. Macdonald, Staff Corps, Revenue Surveyor.

ASSISTANTS.

Captain H. C. B. Tanner, Staff Corps, Assistant Revenue Survey, on Furlough to Europe from 13th March 1866, *vide* G. O., Bombay Castle, dated 14th March 1866.

Lieutenant H. L. Smith, Royal Artillery, Probationary Assistant Revenue Surveyor, appointed *vide* G. O. G. G., Home Department, No. 2966, dated 24th March 1866, joined 5th June 1866.

Mr. W. Ivey, Assistant Revenue Surveyor, 1st Class, on special duty in Great Trigonometrical Survey, from 23rd October 1863 to 20th June 1866, and in 1st Division Oudh, from 21st June to 24th October 1866.

Mr. E. Foy, Assistant Revenue Surveyor, 2nd Class, deserted 3rd March 1866.

„ E. C. Barrett, Sub-Assistant Revenue Surveyor, 2nd class.

„ J. Coxen ditto ditto ditto 3rd „

Sergeant J. Guilford ditto ditto ditto died 3rd April 1866.

Mr. E. Lincoln, Junior Sub-Assistant Revenue Surveyor.

26 Native Surveyors.

Chanda. The work told off for the party consisted of Pergunnahs Chimoor and Bhanduk, of Tehseel Wurrora, and the villages of Pergunnah Wurrora, which had been left unfinished the previous season, owing to defective demarcation. This pro-

gramme was not carried out in its integrity from causes which will be noted hereafter—

	Villages.	Sq. Miles.	Total.
Wurrora contains 228 Villages ... } Contained in 3	Pergunnah Wurrora contains 228	434	} 905
38 Waste blocks } Main Circuits.			
Chimoor „ 249 Villages ... } Contained in	„ Chimoor „ 249	471	
38 Waste blocks } 2 Main Circuits.	„ Bhanduk „ 129	369	
Total ... 447 Villages.			
76 Waste blocks.			

41. AREA SURVEYED.—Of the above, the survey of Bhanduk is incomplete, and no credit for any part of its area will be taken this year. The survey of Chimoor is complete in every respect; whilst in Wurrora there are still 38 villages which the Surveyor was again unable to complete as regards boundary, in consequence of defective demarcation in the field; but as these small gaps in the boundary will not affect the area appreciably, the completed out-turn for the season under review stands at 905 square miles. This area includes

447 villages, and the Government reserves lying within Pergunnahs Wurrora and Chimoor, which were surveyed in 76 blocks on the full scale 1 or 4 inches = 1 mile.

42. Under the operation of the New Waste Land Rules (noticed in paragraph 89 of the Deputy Surveyor General's Report, 1864-65), the re-distribution of land caused many alterations in the originally demarcated boundaries of villages in Pergunnah Bhanduk. Here many Government wastes had to be defined, and consequently the villages re-demarcated. This was not completed by the end of April 1866, and the Surveyor had, therefore, no alternative but to withdraw his parties and leave the survey of Pergunnah Bhanduk unfinished. This is to be regretted, as the labour, expense, and time employed in clearing the heavy jungle, and preparing the tract for survey, will be, I apprehend, lost to a great extent. Captain Macdonald writes:—"we finished our main circuit work and sub-circuits, also 118 villages out of 129, but alterations have since been made, in order to show the waste land plots, so no further mention will be made of Bhanduk in this Report."

43. APATHY OF LANDHOLDERS.—The unwillingness of the Malgoozars to attend and point out their boundaries seriously impeded the regular progress of survey operations on first commencing, but the attention of the Chief Commissioner having been drawn thereto, measures were at once taken under his orders, by the District Officers, to ensure better co-operation on the part of the landholders.

44. **NATURAL DIFFICULTIES.**—The country, which is for the most part wild, rugged, and densely wooded, and in parts very unhealthy, presented a difficult field for the Surveyor. To quote his words:—"In such a country the bare simple line cutting is more than half the whole labour. In some places our lines passed through jungles, where 50 men could not clear 5 chains in a day. Such work means Rs. 150 to cut a mile. For the first three months "the whole establishment did nothing but cut lines," and these lines must be cut, ere it is possible to survey and map the boundaries.

45. **HIGH RATES OF PROVISIONS RULING IN CHANDAH.**—The terrible scarcity of rice (the great staple of life) in Bengal and part of Madras, re-acted on the fertile and well supplied districts of the Central Provinces, and soon raised the rates there to famine price also. In Chandah District the rates were as follow :—

Rice	...	...	...	8, 9, and 10 seers.
Attah	...	...	...	6 and 7
Ghee	...	...	...	1½

This rendered it necessary to bring the orders of the Financial Department, No. 704, dated 22nd February 1866, into operation, and increased pay, on the half scale, was passed to the establishment whilst in the field, and, under the orders of the Chief Commissioner, compensation for the excessive dearness of provisions was granted during recess at Kamptee, to all men drawing less than Rs. 20 per mensem. These extra charges to feed the establishment, the difficulties and delays caused by the Zemindars, the scarcity of labour, and high rates demanded, the imperfect state of the demarcations, in many cases entailing re-surveys, and the necessity of postponing work, in which the old boundary survey had been nearly completed, all combined to swell the cost, and decrease the out-turn of the survey.

46. Taking all things into consideration, I think the Surveyor and his party have done exceedingly well.

47. During the ensuing season, the more advanced state of the demarcations will, I hope, ensure a larger area.

48. **DETAIL SURVEY.**—Interior details in villages as well as waste land reserves, have been shown on the full scale, 4 inches = 1 mile. The Surveyor speaks in high terms of the minuteness and accuracy of the detail survey, which was carefully checked at every step of the proceedings.

49. **PROGRAMME FOR 1866-67.**—The programme for season 1866-67 is as follows :—

1st.—To fill up the gaps in the boundaries of 38 villages of Pergunnah Wurrora.

2nd.—Complete the survey of Pergunnah Bbanduk.

3rd.—Take up Pergunnahs Gurboree and Burhampooree. A topographical survey on the scale of 2 inches = 1 mile is also to be made of the great Mohrlee Forest, lying within the limits of Pergunnahs Bbanduk and Gurboree. This will be cut up into blocks of from 4,000 to 5,000 acres, for convenience of survey.

50. **MOHRLEE FORESTS**—In order to obtain the exact Mouzahwar area of these Pergunnahs, it is necessary that the forest limits should be clearly laid down. The Chief Commissioner has instructed the Conservator of Forests to have this work completed by the end of March 1867. I trust, therefore, there may be no delay or difficulty on this score.

51. ASSISTANTS.—As noted in the Survey Report, 1864-65, paragraph 87. Captain Tanner, the Covenanted Assistant, was obliged to proceed to Europe on medical certificate for 20 months. To recruit the strength of this party, further weakened by the defection of Mr. Foy, the Uncovenanted Assistant, who left his post on the 3rd March 1866, and took up private employment, and the death of Sergeant Guilford, which occurred 3rd April 1866; Lieutenant H. S.

Notification No. 2966, dated
26th March 1866.

Smith was posted to it on the 26th March 1866 as a Probationary Assistant, under orders of Government quoted in the margin, and Mr. G. Barrett was transferred from the Left Bank Indus Survey. The Surveyor reports in high terms of all his assistants, and especially of Mr. C. Barrett. The Native Surveyors, with three exceptions, are also well spoken of.

52. STATISTICS.—Some brief extracts from the Surveyor's Annual Report, descriptive of the country, are given in the Appendix, and will be found interesting.

J. E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

OFFICE OF SUPERINTENDENTS OF }
REVENUE SURVEYS; }
Calcutta, 6th December 1866. }

APPENDIX.

Extract from Annual Report of the Operations of the 1st Division, Central Provinces. Revenue Survey, by CAPTAIN R. E. OAKES, Season 1865-66.

24. Pergunnah Luknadown consists, as far as it has been already surveyed, of a series of plateaus with intervening low lands or valleys; the latter consist generally of fine loamy blocks of cotton soil, and are highly cultivated, while on the plateaus considerable tracts of stony land, covered in places with jungle, occur, interspersed here and there with culturable and cultivated blocks.

There is a vast amount of jungle in the Seonee and Hoshungabad Districts, which in parts attains to considerable height and density.

The principal trees met with are the Sagwan or teak, the Saj tree, the Babool; the three first are timber trees; the Babool, however, being used principally, if not entirely, for naves and spokes of cart wheels, for which it is peculiarly adapted by its hardness and durability. The sapwood of the Tendoo or Ebony is used for shafts, but the heart or black wood is little used, excepting for ornamental furniture, owing to its excessive hardness and brittleness; its fruit is sold in the bazaar. The Dhamun or Indian Lance wood is useful for shafts, banghy poles, &c., it is excessively springy, but does not generally grow to great size. From the flower of the Mohwa a spirit is manufactured, and the dried flower is also used as an article of food by the very poor; an oil is also extracted from the seed, which I understand is often used to adulterate ghee; the tree is a most useful one to the poor people. The Sulaia is utterly useless as a wood, but a valuable gum resin is extracted from it, which closely resembles the gundabarosa of Commerce (Venice Turpentine). It is much used in treatment of sores and ulcers.

The Cheroongee is very abundant, and yields a small plumb-like fruit, the kernel of which is much esteemed, and is sold in large quantities in the bazaar. The Peepul and Burgut are both sacred trees, but I am not aware of their being used excepting as fodder for Camels and Elephants.

The Mangoe needs no remarks further than that a grove of them is very remunerative to its owner.

The Rohar is a very large tree, growing near water, and found along almost all nullahs in the Central Provinces; it is not used as a timber tree on account of the brittleness of the wood.

The Khair is a prickly shrub, sometimes attaining to the height of a tree, valuable for the catechu, which is manufactured from it, and for a gum (similar to gum arabic) which exudes from it during the hot months. There are many other jungle trees and shrubs which it would be impossible to enumerate, but I have given a description of those most useful. Besides the fruits and gums mentioned, the following natural products are to be found, *viz.*, stick-lac, lussa, silk, honey.

25. The principal crops grown are wheat, rice, gram, kodoo, kootkee, jowar, cotton, hemp, flax, tillce, ulsee, castor oil, urrer, moongh, oorud, mussoor, sugar-cane, a little opium, chillies, and tobacco.

A great number of cattle, both buffaloes and cows, are bred in the District, but the latter are very inferior, small animals. This is attributable to the breed, for few Districts afford the same facilities for grazing than part of Seonee and Mandla. Both Districts are well watered, and grass is green and abundant throughout the year. A cattle farm under the superintendence of a European would, doubtless, prove a most profitable speculation.

The only drawback is the unhealthiness of the jungles in certain seasons of the year; but this difficulty might be mitigated, if not entirely removed, by clearings in the immediate vicinity, and by properly built double-storied houses. Land is very cheap, and in no other part of India out of the Himalayas could a project of this nature be set on foot on such favorable terms.

26. The only metalled road in the portion of Luknadown which has been surveyed is the Jubbulpore and Nagpore road, which runs across it in a south-westerly direction. It enters the District at the Silwa Ghât, a splendid road rising at an easy gradient from the plain in Burghee Pergunnah, District Jubbulpore, to the top of the Ghât on the plateau of Seonee District.

The road is metalled and bridged throughout, it crosses the Sher River over a fine bridge of 5 arches of 50 feet each on the south-western side of No. 1 Circuit. There is a Dâk Bungalow at Dhooma. There are also road Bungalows at Silwa Ghât at Dhooma, and at a short distance from the right bank of the Sher. The road has been made, and bridges built by J. Heyman, Esq., Civil Engineer, who very kindly offered to place any of his Bungalows at the disposal of the survey, if required.

There is an unmetalled road not practicable for wheeled conveyances running in a southerly direction from the village of Deoree in Circuit 2 through the Circuit. The great inequality of surface in this district from plateau to low land, and the total absence of made-roads, prevent the possibility of wheeled traffic; carts are consequently unknown (excepting of course on the Nagpore Road) throughout the district. All the traffic takes place on buffaloes' and bullocks' backs, and the Brinjarrees seem to drive a thriving trade if one may judge by the countless troops of these wanderers, who are met with day by day in all parts of the Pergunnah.

27. The principal rivers are the Sher, Sonair, Temur, Baghora, Machra, besides the Nerbudda, which runs along the northern side of Circuits part of 1, 2, and the northern and eastern of No. 3, and divides for a portion of its course the Jubbulpore and Mundla Districts from Seonee District. It has high banks throughout, and at the village of Beoharee flows through a narrow channel, over a bed and between walls of columnar basalt.

Some of these columns are of very peculiar appearance, perfect in shape, about 6 feet across, and of a dark metallic lustre.

The forest scenery on either bank is beautiful in the extreme; the infinite variety of foliage of every conceivable shade delights the eye, and bears testimony to the natural richness of the soil when properly watered. Want of irrigation is the great fault in the agriculture of the Province, sometimes caused by natural difficulties of obtaining a proper supply of water, but too often also attributable to the apathy and short-sighted stinginess of Malgoozars. The principal villages are Dooma, Dewaree, Ghunsore, and Radarpore.

PERGUNNAH CHARWA.

28. This Main Circuit was run and portion of the line cutting got through last season (1864-65). It was completed this year, and the interior details surveyed under Mr. Grant's

superintendence: the whole Circuit, with the exception of a few Malgoozaree villages, is waste land, in places stony, but a great deal of excellent culturable land is met with in the south ranges of hills running parallel with the Sathpoora Range. The land in the valley between this range and the Sathpoora is generally excellent, especially in south-east corner.

The Circuit is bounded on the north by the portion of Charwa, previously surveyed; on the east by the independent State of Mukrai, and portion of Khaleebheet (which will come in the topographical survey with the Sathpoora Range); on the south by the Sathpoora Range, and on the east by Nimar and the Chota Towa River. In the northern portion the country is covered by grass and bush jungle, which get heavier and more forest-like as you proceed southwards towards the hills. The southern face of this Circuit has been connected with Mr. Mulheran's triangulation; and platforms connected with the Main Circuit have been built for further connection by the topographical party, who may hereafter survey the Sathpoora Range.

29. The trees are very similar to these in the Seonee District already described.

30. The principal rivers are the Chota Towa, which divides the western boundary from Nimar. The Machuk, Gora, Kuchar, Kondea, Gara, Semree, Kootnee, Gunjal, Ajuun, Kala Machuk; and the chief villages Magurdha, Kehutgaon, and Lokurtolai.

31. The principal, in fact the only, road is the Bombay Road, which runs for a short distance along the north of the Circuit. The G. I. P. Railway also borders the Circuit on the north-west for a short distance. No doubt a large portion of this Circuit is susceptible of cultivation, and its proximity to the railroad will, doubtless, tend more than any thing else to its reclamation.

32. The small Seonee Circuit is very similar to the Hurda Circuit surveyed in 1864-65; part of it is open and part waste land; it is bounded on the north by Circuits 47, 48; on the south by the Sathpoora Range; on the west by Mukrai and Khaleebheet, which lie between it and the Charwa Circuit No. 14.

33. A trace of the southern boundary of Hoshungabad District will very shortly be furnished to Mr. Mulheran; on it all the prominent platforms and stations connected with our Main Circuits will be shown, and will, I trust, be found amply sufficient to enable him to connect his survey with ours.

34. It is a remarkable fact that over the extensive forests and jungles, traversed in the course of survey, so few good timber trees are met with, excepting on the highest and most inaccessible ranges of hills. This is entirely attributable to the indiscriminate destruction of trees and jungles that used to take place before the inauguration of the conservancy system, the good effects of which are already appreciable.

The Gonds have much to answer for in causing this dearth of wood. Naturally a wild, wandering race, shunning the vicinity of populous and cultivated tracts, they cleared spaces in the dense jungles with their axes, felling shrub and tree without remorse. A few huts built, neatly enough, of bamboos, daubed with mud, and surrounded on all sides by a very high bamboo fencing, sufficed to shelter them from the weather and the nocturnal visit of wild beasts.

To clear the ground for agricultural purposes, the trees and shrubs were set fire to, and in the ashes, which served for manure, some Kodoo or Kootkee was scattered broad-cast, which, in due time, sprung up and supplied their very moderate wants. A few years exhausted the

soil, and they removed to fresh quarters, if they had not been driven forth earlier by a man-eating tiger, or an unusually unhealthy season; and so the work of destruction was repeated over and over; few who had not seen it would credit the extent of the mischief done.

Under the new Forest Regulations, this has been put a stop to. The cutting of certain timbers has been prohibited entirely in places, and is only allowed in such forests as may be pointed out by the Forest Department, and on payment of a royalty for the privilege.

A tax is also levied on firewood, grass, and other jungle produce on all Government waste lands.

The grazing is also let out at a certain rate per hundred head of cattle.

Extract from Annual Report of the operations of the 3rd Division, Central Provinces, Revenue Survey, by Lieutenant J. H. WILLOUGHBY OSBORNE, Season 1865-66.

32. SAUGOR CANTONMENT MAP.—The Cantonments, Civil Station, City and Suburbs of Saugor, were surveyed during the past season on the scale of 10 inches = 1 mile, and the country for some distance outside the boundaries has also been taken up; the several roads and passes over the hills leading out of the station have been entered in the map, which is the joint production of Lieutenant Andrew and Mr. Lawson. No pains have been spared to render it as correct as possible. The forces at Saugor comprise one Garrison and one Light Field Battery, one Regiment of Madras Light Cavalry, one European Regiment of Foot, and one Regiment of Madras Native Infantry. It is the residence of a Brigadier General and Staff, also of the Civil Authorities of the district. The chief Public Buildings are the Commissioner's and Deputy Commissioner's Court-houses, a Jail, a Fort, and what was formerly a Mint, now used as a private residence by the Collector of Customs. The Cantonment is surrounded by hills, and the station has the appearance of having been built upon what was formerly the bed of a large lake; spurs of the adjacent hills run right into the centre of the cantonment which is in consequence very undulating. During the mutiny, the inhabitants of the station had to fly for refuge to the fort, but owing to the advance of a British force, they were not molested.

38. DESCRIPTION OF COUNTRY SURVEYED.—The tract surveyed consists of the Hutta Tehseel and portions of Punnah; it is bounded on the north by the Independent States of Punnah, Bisawur, and Adjyghurh; on the south by the Dumoh Tehseel; on the east by Jubbulpore and Punnah; and on the west by the Punnah State and Saugor district. It is intersected by the Sonar river and the Bearim, which for some distance flows along its eastern boundary. The country is generally undulating,—only a small portion of it, forming the valley of the Sonar, being really flat. A peculiar low range of hills run along to the north of the Sonar, which rises so gradually as to be almost imperceptible. To the south-east is a large block of hills which are a continuation of those shown in the map of the Mangurh Pergunnah of last season. To the north it is also hilly, the peculiar feature of these being the very precipitous fall to the streams; to illustrate which, Mr. Lawson has entered two drawings made by himself when out surveying the hill topography of Main Circuit No. 14. These portions of the district are very wild, the villages being for the most part composed of two or three houses, built entirely of wood and grass, plastered with mud to keep out the wind. A marked difference is to be seen in the villages on approaching the more civilized portion, which improve in size, appearance, cleanliness, and style of building; and the land instead of being one mass of forest is a sheet of cultivation. The inhabitants of the wilder portions, and of the adjacent states, flock down in large numbers for the

harvest.—but this last year they did not remain many days, as they said that there was not sufficient inducement: the harvest being a failure, and but small pay obtained.

39. MINERAL PRODUCTIONS.—Iron is found in large quantities along the northern frontier of the district, and in the outlying village of Koopie, where, at certain seasons of the year, there are several smelting furnaces; large quantities of the ore, in its native state, is exported from Bijawur to the villages to the north of the district, where fuel is more abundant; smelting furnaces are to be found in almost all of them. I found upon enquiry that out of every 4 pounds of ore smelted, at least 2 pounds of pure iron is obtained; the ore is in my opinion very rich, and would, with better appliances and improved means of working, yield a much larger return.

40. CULTIVATION.—The centre portion of the Tehseel is highly cultivated; the soil being that known as kabur, moond, and ruttia. The first is the most productive, and produces wheat, gram, mahsoor dal, and linseed; when irrigated it will grow sugar-cane and vegetables. Moond is a slightly less productive soil, of a brownish color, and is sometimes found mixed with Kunkur. The crops grown on it are much the same as those on Kabur. Ruttia is very similar to Moond, excepting that it forms large clods when ploughed, and does not retain moisture for any length of time. The chief products of this portion are wheat, gram, cotton, mahsoor, and arrur dal, linseed, bajra jowar, hemp, and castor oil seed, also small quantities of rice, sugar-cane, kootkee, and kodoo; the two latter being only grown in the wilder portions where other crops cannot be produced.

41. FOREST TRACTS.—A tract of land in the vicinity of Muriadoh, commonly known as the Rumna, is a conserved forest; it is well stocked with teak, koha, and mahooa trees. To the north, and to the south-east, are large tracts of land covered with dense forest, but only in the vicinity of streams do the trees attain any size.

42. FOREST TREES.—Teak is to be met with in every small patch of jungle, its girth not being great, as by far the greater portion of it has sprung up since the restriction was placed upon cutting it and other valuable timber trees. The following trees are also frequently to be seen:—

Sal	...	...	...	Shorea Robusta.
Bijesal	...	...	...	Pterocarpus Marsapumen.
Dhak	...	...	...	Bulia Frondosa.
Cheronghee'	...	...	...	Cheronjia Sapida.
Aonla	...	...	...	Phylanthus Emblica.
Saj	...	...	...	Pentaptera Tomentosa.
Neem	...	...	...	Melia Azedirachta.
Mahooa	...	...	...	Bassia Latifolia.
Peepul	...	...	...	Ficus Religiosa.
Babool	...	...	...	Mumosa Arabica.
Tamarind	...	...	...	Tamarindus Indica.

43. HILLS.—The hills attain no very great elevation, those to the north being a continuation of the Bijawur group, and of a similar geological formation. All of them have a portion of their sides nearly perpendicular, generally ceasing suddenly with a very precipitous fall at nearly every stream. The ground at some distance from the Sonar, commences to rise most gradually, and continues to do so until it almost reaches the foot of the hills.

44. TANKS.—Small tanks are to be found in all the larger villages; in the village of Runch, there are a large number. Some of these are surrounded with substantial masonry walls with flights of steps leading down to the edge of the water. Coolen, wild geese, duck,

teal, and water fowl of every description, congregate in large numbers on these, and it is seldom or ever that on even the smallest pool of water, during the cold season, none are to be seen.

45. RIVERS.—The beds of all the rivers are rocky. In the hot season, most of them can be forded dry-shod in places; but when full, during the rains, these river currents are without exception extremely swift. Boats and canoes are seldom used except at the fords, and also for fishing.

46. BEARIM RIVER.—The Bearim flows through a portion of the Huttah Tehseel, and for some distance along its eastern frontier, separating it from the Native States of Punnah, Bijawur, and Adjgurh. Its banks are for the most part high and precipitous; its bed, to judge from its appearance at the different fords, is composed of flat rocks and loose stones; but the long reaches and paucity of fords prevent a good idea being formed of what it is in reality. During the rainy season, it becomes an unfordable torrent; there are but few places at which boats are to be found of a size sufficient to withstand the current, at which points only it can be crossed.

47. SONAR RIVER.—The Sonar is the next most important stream; it is seldom very deep, and fords exist at almost every village during the dry season, these are unavailable for foot passengers during the monsoon, when ferry-boats ply at the more important crossings for the conveyance of passengers. Its banks are lined with scrub jungle, interspersed with trees, giving it a more picturesque appearance than most of the other streams in these provinces. Huttah, the chief town of the Tehseel, is situated on its banks.

48. CANE RIVER.—The Cane River, of which the two former rivers are tributaries, is situated to the north of the Huttah Tehseel, and flows along the boundary of Oorlah, an outlying village belonging to Huttah; it is a much larger stream than either of those already mentioned, with high banks and stony bed.

49. OTHER STREAMS.—The other streams are all unimportant, most of them are regular mountain torrents, running dry almost immediately after the close of the rainy season, with the exception of a few deep pools, at which the village cattle are watered, and from whence the supply necessary for the wants of the surrounding villages is obtained.

50. HIGH ROADS.—The high roads in the present portion of the District are very inferior, having few of the streams on them spanned by bridges, the system of metalling appears unknown, and superficial repairs with earth, dug from the roadside, is all that has been done to them for years; but under the present energetic Deputy Commissioner, a great change is perceptible, as bridges are springing up over most of those where the building is not attended with any engineering difficulties.

51. JOKEHI ROAD.—This road is the most direct route from Dumoh and Saugor to Calcutta, and is much used by travellers between those places during the dry season, but directly the rains commence, it becomes almost impassable; bearers carrying doolies, &c., often prefer the fields to the road. Large parties of Brinjarrabs carrying grain and salt are to be met with daily on this road during the cold season, and at the commencement of the hot weather.

52. NAGODE ROAD.—The Nagode Road runs through the city of Huttah, and passes the villages of Gysabad and Hinota. It is a far better road than the last, which is attributable to the soil of the country through which it passes being a species of red gravel. Bridges are being built over some of the streams, others between Huttah and Dumoh being already bridged.

53. **PUTEHRA ROAD.**—A road is also under construction from Huttah to Putehra ; it has been marked out, made, and planted on either sides with trees for about half the distance, the remaining portion being an ordinary village road.

54. **VILLAGE CART ROADS.**—There are roads also from Muriadob and Nursingurh to Huttah. These undergo superficial repairs at the close of the rainy season, and during the dry weather are available for wheeled traffic.

55. **OTHER ROADS.**—The remainder of the roads are unimportant, and for the most part are mere tracks. The only use to which they are put is transporting grain to the nearest market, and during the harvest for conveying the produce of the fields to the threshing floors outside the villages.

56. **KOONDULPORE MELA.**—The fair, which is held annually at Koondulpore, is renowned throughout India, and is attended by goldsmiths and jewellers from all parts of the country, bringing for sale jewellery, precious stones, &c., of all descriptions. Europe piece goods and articles of Native manufacture are exposed for sale during the fair, and large quantities of metallated dishes, &c., such as lotahs, kutorees, and thalees (manufactured at Putehra of kansa), are disposed of at the same time. Pilgrims and visitors in large numbers resort to this place during this fair, and Native reports affirm that upwards of 300,000 people were present on the last day of this year's fair ; but this I should say was open to doubt, and that one-third of the number would be nearer the mark.

57. Another fair is held near the junction of the Bearim and Cane Rivers during the month of February ; this is chiefly attended by religious devotees from the Dumoh District and adjoining States, it being a place of pilgrimage and sacred bathing place.

58. **BAZARS.**—Bazars or markets are held in all the larger villages at which the inhabitants of the surrounding villages dispose of the produce of their fields, and purchase whatever necessities they may require.

59. **HUTTAAH CITY.**—Huttah, which is prettily situated on the banks of the Sonar, lies on the direct road between Nagode and Dumoh. It has a Police Station, a Tehseel, a School, Dispensary, and Serai. It was, previous to the year 1836, the head quarters of the Civil Authorities of the District, but in that year the Station was moved to Dumoh, the present residence of the Deputy Commissioner, &c.

60. **RUNEH.**—The ruins in the vicinity of Runeh lead one to imagine that in former times it was a much larger and far more important town. The tanks in this village are numerous, some of which are walled all round, and are furnished with steps down to the water's edge ; but they are gradually silting up, and many of them, during the hot weather, dry up entirely.

61. **PUNCHMUNGGUR.**—Punchmunnuggur is a large walled town, at the south-western corner of the Tehseel, and it is at this town that the fortified wall which runs across the district is first met with. This town is celebrated throughout these provinces for the paper manufactured here, large quantities being annually exported to the adjoining districts. The paper is made of three sorts, and this manufacture affords a means of livelihood to upwards of 30 families.

62. **KERBUNNA.**—Kerbuinna is a large village on the Beas River, containing about 1,100 inhabitants. There is an indigenous school in it with a fair attendance of pupils ; it is, I believe, one of the best of the kind in the District.

63. **KOTAH KHAS.**—This is the largest village in that portion which lies to the east of the Bearim. A fair is hold here twice a week, to which people come from considerable

distances for supplies. It is situated close to the banks of the Bearim at the foot of an isolated hill.

64. **PUTEHRA.**—Putehra, a large village, formerly the most important one in the Pergunrah which took its name from it, is the seat of a manufacture of utensils composed of an alloy of zinc, copper, tin, and lead. Brazier's and blacksmiths are rather numerous here.

65. **FUTTEHPORE.**—Futtehpore is a considerable market town, about 8 miles to the north-west of Hutta, containing about 2,000 inhabitants. The Koostahs and Kohrees weave coarse cloths called Uddaputtees and Khadee; this village is, I believe, one of those in which proprietary right has been granted to others than the Malgoozar, who has now lost nearly all his influence and power in it, as the several new proprietors exert their lately acquired strength against him.

66. **MURIADOH.**—A town of about 450 houses, is situated on the banks of the Jogerdabur Nala. Until the year 1860, it formed a portion of the Churkaree State, when it was exchanged for some territory in the Hummerpore District. There is an old fort here which was built by the Boondelas prior to the coming under our rule, and in it there is an old Palace, which was used as a residence by the Churkaree Rajah, whenever he visited the place. In this fort there is also a Police Station and Government School. A portion of the land of this village is preserved as a timber forest, which is now well stocked with Teak and Koha trees.

67. **FORTS.**—There is an old fort at Punchumnggur, and another in the village of Bhilonee, and a third at Huttah, all of which bear traces of great antiquity; the others are small and of no importance. All these are built in the old style, entirely of masonry, with bastions at each corner, and is loop-holed for musketry on all sides, like almost every well-built house in the District.

68. **FORTIFIED WALL.**—A peculiar feature met with during the field season was an old stone wall, which has in some parts been entirely obliterated, though traces of it are visible through the entire length of the Huttah Tehseel. I have been unable to discover by whom or at what period it was built; but it bears signs of great antiquity, and has the appearance of having been built for defensive purposes, as, in the more perfect portions of it, rude loop-holes and bastions are to be seen.

69. **PLACES OF PILGRIMAGE.**—Koondulpore is a sacred place of pilgrimage, and during the time of the fair is visited by large numbers of people of all descriptions, most of whom ascend the hills for the purpose of paying their devotions to the great idol, placed in the centre portion of the principal temple; this temple, which is very old, escaped the Pindarees and others who destroyed and mutilated every thing they met with, traces of their work being visible to the present day.

70. **MANUFACTURES.**—A species of alloy called Kansa is manufactured at Putehra, its components being lead, tin, zinc, and copper; lotas, kutorahs, thalees, and other articles generally used by Natives are made of it, and large quantities are sold annually at the fair at Koondulpore, and exported largely to other parts of India. Cotton is worked up into a coarse cloth at almost every village in the plains; blankets also are manufactured by the owners of large herds of sheep.

71. **TRADE.**—The trade consists chiefly of piece goods, betelnuts, cocoanuts, raw silk, hardware, sugar, &c., all of which come from Mirzapore and the North-West Provinces. Most of this finds its way to the markets of Saugor and Bhopal, and a large trade in salt is

carried on by the Brinjarrahs, however only a small, very small proportion of that brought to the District remains there, it being taken through the adjoining Districts and States.

72. **INHABITANTS.**—Brahmins, Pundits, Rajpoots, Sooddars, Koormees, Koorees, Koosh-tas, Kahurs, Chumars, and Gonds form the bulk of the population. Brahmins are very numerous, and are divided into the following classes, viz., Missur, Paturea, Doobe, Tewaree, and Sunoureea. The Missurs form the greater proportion of the inhabitants of the villages around Huttah. The Putehra Brahmins are most numerous at Runeh and Gysabad, but small numbers are found scattered over most parts of the District. The Doobes, who are said to have come originally from the Doab, are also numerous in the Huttah Tehseel. Extensive Colonies of the Tewarces are found at Hutta, Runeh, Burkhera, and Nursingurh. The Sunoureea Brahmins who have been settled in the District for upwards of four centuries are found at Setanuggur, Huttah, and Runeh; detached families are spread all over the District. The Pundits who are not very numerous are most found at Huttah. No large numbers of Pundits ever appear to have settled in any one place, but one or two families are located in most of the large villages. The Koormees, Kooshtas, Koorees, Bearers, and Chumars, who form the bulk of the working classes, are found in every village. The Gonds comprise a very small proportion of the inhabitants, residing for the most part in the wilder and more hilly portions of the District.

73. **WILD ANIMALS.**—Wolves, the most destructive animals to human life in this District, annually carry away a large number of children from the villages. Antelope, the various kinds of deer, and wild hog commit great depredations on the crops. Tigers, leopards, panthers, and bears are also occasionally heard of.

74. **GAME.**—The game found in this Tehseel is the same as that in Dumoh, with this difference that antelope and coolen are much more numerous, whereas tigers, wild hog, &c., are much less so.

75. **FISH.**—Mahsur and Saolee are the largest kinds of fish in the streams in this Tehseel; they seldom or ever attain any very large size, about 11 lbs. being the weight of the largest fish I saw last year.

Extract from Annual Report of the operations of the 4th Division, Central Provinces, Revenue Survey, by CAPTAIN JOHN MACDONALD, Season 1865-66.

13. **GENERAL APPEARANCE OF THE DISTRICT.**—Pergunnah "Wurroa" has open champaign country for some miles near the River "Wurda," which flows along its south-western boundary, its northern boundary is the "Pole" Nuddee, which flows due west into the "Wunna," the latter by a south course falls into the "Wurda." Thus all the water-shed of the Pergunnahs drains into the "Wurda" through the Nullahs "Dhonult," "Sir," and "Eraee;" at the source of the latter, the water-shed of "Chimoor" is south-easterly; all the waters draining through the "Andaree" Nuddee into the "Wein Gunga." At "Shunkerpore" in the north-east corner of the "Chimoor" Pergunnah, the highest water-shed of the District is to be found, whence the water-shed flows due north through the "Murroo" Nuddee into the "Wein Gunga."

WATER-SHEDS AND SOIL.—The broad distinction between the two lines of drainage is that of black soil into the "Wurdah," and red soil into the "Wein Gunga;" on the former the staple crops are cotton, corn, oil seeds, and pulses; on the red soil, rice predominates, and the other cereals are grown on scattered patches of black soil. "Pan" and gardens are irrigated from tanks or wells.

TANKS.—In "Chimoor" the area of tanks covers 4,641 acres as compared with 1,398 acres in "Wurroa," and the number of tanks in "Chimoor" is very much in excess of those

in "Wurrora." From the summit of the "Ghur" hill above "Lowaree," I counted 47 tanks, nearly all of which were situated in "Chimoor."

HILLS AND THEIR GENERAL FORMATION.—In "Wurrora" there are but few hills, but "Chimoor" is within an amphitheatre of hills. All these hills have the same formation, being of laterite—table topped, with ascents at a regular gradient, generally steeper towards the north and west, the general direction of each hill is from north to south, occasionally scarped faces of basalt present themselves. Granite boulders creep out on the surface, and in the beds of "Nullahs" sheet rocks of the finest white limestone are commonly found; along the eastern base of the "Kussarboree" hill, there are broad tracts of the finest nodular limestone, and I am convinced that sulphur is to be found in the

neral products. "Kussarboree" hill on its eastern face, about 2 miles south-west of

"Kotran." Iron ore is to be found in "Chimoor" in small quantities. The highest hills in the district are those east of "Dhomar" separating "Chimoor" from "Burhampooree," these hills will be completely surveyed with the work in "Burhampooree."

The iron roughly forged in these Districts is exceedingly good, and from it excellent steel can be produced.

NATURAL PRODUCE AS FOOD FOR MAN.—In the forest the cotton tree and butter tree are most generally met with, the latter under the name of "Mowah" gives food to the Gonds for half, and drink for the whole year; wherever a spring exists or water is stored artificially, mangoe trees abound; tamarind trees shade every village, and are common in the "jungles," the bael tree is to be seen in equal numbers, the "Karinda" and "Phalsa" bushes are plentiful, and every tank is full of lotus and the water-nut.

SCENERY.—The general appearance of the country is that of a pleasing landscape, in which undulations covered with crops of forests, and horizons broken with hills are relieved by large surfaces of water. Broad tracts of grazing ground shaded by large trees would please the most fastidious Park proprietor, and in the "jungle" and on the banks of "Nullahs" and tanks, the drooping luxuriance of bamboo growth, shows all its graceful curves in reflected brilliance. The villages are kept in a clean and orderly condition, and their conservancy is most strictly attended to by the Deputy Commissioner.

In many villages the temples to "Mahadeo" are curiously carved, and, as specimens of elaborate ornamentation, deserve attention, but the figures are hideously grotesque, and as ugly as a Hindoo god can possibly be required to be by its worshippers. As accessories and associations, these buildings are always picturesque in a village scene. On completing the "Chanda" District, I will report on its productions in minerals and timber.

ROADS.—A bridged and metalled road from "Chanda" to "Nagpore," passes through the "Wurrora" Pergunnah.

PUBLIC BUILDINGS.—At "Wurrora," there is a Tehseeldar's Office, a school house, staging lungalow, and "dhumrumsalla" for Native travellers.

At Chimoor there is a school house, a mere shed scarcely worth mentioning as a public building.

(True Extract)

J. E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

No. 13.

FROM

THE OFFG. DEPY. SURVEYOR GENERAL OF INDIA,

TO

THE SECY. TO THE GOVT. OF INDIA, HOME DEPARTMENT.

Dated 6th December 1866.

SIR,

Under instructions contained in para. 4 of Orders No. 462, dated 2nd ultimo, I have the honor to submit the accompanying Report on the Revenue Survey Operations of the 1st and 2nd Divisions, Oudh, during the season 1865-66.

2. This season but two parties were employed in Oudh, against three of previous years. The out-turn of both and the cost at which that out-turn was effected are given below :—

Oudh Survey Divisions.	District in which employed.	No. of Villages or Waste Land Blocks.	Square Miles, Area.	Total Expenditure.	REMARKS.
1st Division ...	Mohumdec. ...	1,010	1,080	56,361	
2nd ditto ...	Hurdai and Baraitch ...	1,113	1,120	59,633	
Grand total, 1865-66 ...	...	2,123	2,200	1,15,994	
Grand total, 1864-65, by the same two parties ...	...	2,724	2,815	1,08,528	
		— 601	— 615	+ 7,466	

3. The difference in area is accounted for by the superior practice introduced this season of furnishing the Settlement Officers whilst in the field with detailed areas of waste, cultivation, fallows, &c., of each village under survey, which greatly increases the work in the field; but at the same time it much more than compensates for any small loss in area by the very superior results obtained when that practice is *bona fide* carried out and utilized to its full extent. I trust that the practice having been now fairly introduced in Oudh may be rigidly followed out, and comparisons of settlement and professional areas be not left until return to recess quarters. Major Anderson was obliged, moreover, to curtail his field operations to permit of his coming to Calcutta with part of his establishment to revise certain boundaries of his previous

season's survey in Oudh, which, as at first delineated, were apt to lead to doubt and confusion hereafter. Major Anderson set to the extra work with alacrity, completed it quickly and well, and returned to his recess head-quarters at Nynee Tal in ample time to finish his present season's work, and retake the field in Oudh, as usual, without any arrears in hand.

4. Every exertion is being made in the Drawing and Lithographic Offices to hasten the publication of Sectional Maps of Oudh on the scales of $\frac{1}{4}$ inch and 1 inch = 1 mile. Each full section of the small scale will contain 2 degrees in latitude by 2 degrees in longitude, or about 16,960 square miles; whilst the large scale sections will contain 20' of Latitude by 30' of Longitude or 713 square miles.

5. Of the $\frac{1}{4}$ inch maps, the southern sections, Nos. 3 and 4, containing nearly half of Oudh, have been compiled and reproduced by photography, and copies have been issued for the use of local Officers and Government. Fairly successful transfers to stone have also been made of these sections by the carbon process, so that any number of photolithographed copies will soon be available.

6. A preliminary map of the district of Fyzabad, scale 8 miles = 1 inch, and a plan of the city and cantonment of Roy Bareilly have also been lithographed.

I have the honor to be,

SIR,

Your most obedient Servant,

J. E. GASTRELL, *Lieut.-Colonel,*

Offg. Depy. Surveyor General of India.

GENERAL REPORT
ON THE
REVENUE SURVEY OPERATIONS
OF THE
~~PROVINCE OF~~ PROVINCE OF OUDH.

For Season 1865-66.

FIRST DIVISION, OUDH.

The survey of the Seetapore District having been completed by the 1st Division, Oudh Survey in 1864-65

Major F. C. Anderson, Staff Corps, Revenue Surveyor.

ASSISTANTS.

Lieutenant A. D. Butter, Staff Corps, Assistant Revenue Surveyor.

Mr. W. H. Patterson, Assistant Revenue Surveyor, 1st Class (on deputation), transferred to 2nd Division, Oudh, on the 18th April 1866.

Mr. C. W. Campbell, Assistant Revenue Surveyor, 2nd Class.

Mr. G. R. Buttress, Sub-Assistant ditto,

Mr. W. S. Buttress, ditto ditto,

Division, Oudh, on the 18th January 1866.

Mr. J. A. Swyny, ditto ditto,

Mr. H. T. Hanby, ditto ditto,

34 Native Surveyors.

its operations during 1865-66 were carried on in the District of Mohumdee, immediately adjoining, and lying between the parallels of 27° 38' and 28° 40' north latitude, and the meri-

dians of 80° 05' and 81° 22' east longitude. The Nepalese territories bound it to the north; the Oudh districts, Buhraitch, Seetapore, and Hurdul on the east and south; and District Shahjehanpore, North-Western Provinces, to the west.

AREA.	No. of Villages.	AREA.	No. of Villages.
* Of Pergunnah Ubgawan ...	73	Of Pergunnah Sekundrabad ...	31
" Ourungabad ...	114	" Pyla ...	59
" Burwar ...	60	" Busara ...	34
" Pugnawan ...	104	" Kurunpore ...	60
" Mohumdee ...	136	" Alleegunge (part of) ...	65
" Mugdapore ...	36		
" Pipurianutwa ...	30		
" Hyderabad ...	133		
		TOTAL ...	940
		Of Shahjehanpore District ...	70
TOTAL ...	691	GRAND TOTAL ...	1,010

2. Field work commenced early in November 1865, and, continuing uninterruptedly until the middle of April following, resulted in a total out-turn of 1,080 square miles, comprising 1,010 villages.*

3. RE-DEMARCATON OF BOUNDARY OF OUDH AND NORTH-WESTERN PROVINCES.—The 70 villages of the District of Shahjehanpore were surveyed for the double purpose of forming, if possible, a junction with the old surveys of the North-Western Provinces, and for the better determination of the limits of Oudh in that direction. The only map of the former survey existing which could be furnished to the Surveyor for comparison of old and new boundary survey, was one on the very small scale of 2 miles = 1 inch. This was quite useless for the reproduction of the old demarcation. But on reducing the present survey of the boundary as demarcated and marked by masonry pillars under the superintendence of the Settlement Officer, Mr. J. Cavanagh, to the same small scale, it was clear, on comparing the two maps, that the numerous discrepancies apparent along the whole common line of boundary could not be attributed to mere accidental discrepancies in drawing; but that, notwithstanding every precaution, a new boundary line had been demarcated, differing considerably from the old, and affecting the areas of villages on both sides accordingly.

4. ABSENCE OF PERMANENT LAND-MARKS IN FORMER SURVEY OF NORTH-WESTERN PROVINCES.—Had permanent marks been erected at the time of previous demarcation and survey, the present doubt and uncertainty could not have possibly existed. As it is, I see

(Vide paras. 23 to 26 of extracts from Surveyor's Report in appendix.)

no practical means of reproducing the old limits in their integrity. It only remains to decide what shall be the limits for the future, and that these having been once established and decreed, the whole line of frontier between Oudh and the North-Western Provinces shall be permanently marked by masonry platforms and pillars, and that the present maps shall then be corrected, and areas of villages be adjusted, once and for all, according to these finally determined limits. Until this be done, the areas of the boundary villages, and, consequently, the final areas of the districts bordering on the North-Western Provinces, must remain doubtful.

5. PRECAUTIONS TO ENSURE ACCURACY AND UTILITY.—Every precaution has been taken to ensure the correctness of the survey and its utility for the future in Oudh. The masonry platforms marking the village tri-junctions have been adopted as survey stations wherever practicable, and their co-ordinate values being entered in the traverse calculations, any new lines of rails, canals, or common roads, can be at once laid down and projected on the 4 inches = 1 mile atlas sheets. This alone will afford great facilities to the Public Works Department in any future projects for improving the communications, &c., of the country, and the completeness of the survey in an engineering point of view would have been complete had lines of levels been simultaneously run and entered on our maps after reduction to one common datum.

6. CHECK SURVEY.—The correctness of the interior details was rigidly checked by independent lines of survey, varying from $\frac{1}{4}$ to $\frac{1}{8}$ th of a mile in breadth, carried across the various circuits by the Senior Military and Civil Assistants; and the results are said to have been highly satisfactory.

7. CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.—Four Tower stations of the Great Trigonometrical Survey met with and closed on in the course of survey afford another excellent and final check on the chain and angular measurements. The results of comparison of Revenue Survey distances (as given by the Revenue Surveyor) with those of the Great Trigonometrical Survey are as follow :—

NAMES OF GREAT TRIGONOMETRICAL STATIONS.	Direct distance in feet from Great Trigonometrical Survey.	Direct distance in feet from Revenue Survey.	Error of Revenue Survey in feet.	Error per mile in feet.	REMARKS.
From Parsar to Bulandpore ...	62,556·9	62,605·6	+ 48·7	4·11	
From Parsar to Jerura ...	83,247·8	83,134·9	— 112·9	7·17	
From Bulandpore to Jerura ...	83,360·1	83,332·9	— 27·2	1·72	
From Bulandpore to Dahlelnugar ...	79,646·9	79,567·6	— 79·3	5·26	
From Jerura to Dahlelnugar ...	62,377·9	62,413·6	+ 35·7	3·02	
From Jerura to Kokra ...	73,857·3	73,832·9	+ 24·4	1·74	
From Dahlelnugar to Kokra ...	74,010·0	74,021·0	— 11·0	0·78	
Average where the error is + ...	... ..	... ..	... ..	2·53	
Average where the error is — ...	... ..	... ..	... ..	4·02	

8. SETTLEMENT AND PROFESSIONAL OPERATIONS CONDUCTED TOGETHER.—The Settlement Department worked simultaneously with the professional parties, and was furnished monthly from December to June with the detail area of villages. The result of the comparison of areas by the two establishments was favorable. The differences in the aggregate village area is reported at not more than 4 per cent., and in the interior or detail areas under 8 per cent. The following Tabular Statement of detailed areas will show the present state of this portion of Oudh :—

NAMES OF PARGANAH.	No. of Village Hukkah.	AREA IN DETAIL IN ACRES.								Total Area of each Parganah.
		Cultivation.	Fit for cultivation.	JUNGLE.			Mango-trees and Gardens.	Barren Waste.	Roads, Paths, Jheels, Tanks, Nullahs, and Village Sites.	
				Forest.	Dush.	High Grass.				
MAIN CIRCUIT No. 1.										
Ubgawan Kusta...	73	25,143.28	2,172.90	12,450.03	14,401.21	421.00	1,451.30	59.00	3,300.10	50,549.23
Ourangabad ...	114	36,077.32	13,462.24	11,179.77	1,812.34	2,239.50	1,383.40	1,072.90	2,657.60	60,867.07
MAIN CIRCUIT No. 2.										
Durwar ...	60	14,530.50	2,413.10	.....	4,579.30	503.50	1,280.00	48.40	1,021.70	24,380.40
Paugawan ...	104	22,517.60	5,469.00	.....	17,226.00	1,757.70	1,887.20	127.50	3,428.50	52,414.00
Mohumdeo ...	136	41,527.60	10,119.10	1,261.80	10,084.30	2,426.00	2,914.40	229.40	4,240.40	73,403.50
MAIN CIRCUIT Nos. 3 & 5.										
Mugdapore ...	36	16,160.70	4,185.10	6,209.00	1,307.00	808.00	281.00	6.20	1,304.30	34,562.70
Pipurianutwa ...	30	12,234.50	2,084.80	12,384.50	3,629.70	8,302.40	317.00	8.70	1,303.40	41,145.60
Hyderabad ...	139	33,250.40	4,653.80	88,370.40	7,827.10	19,733.90	1,973.90	146.00	5,950.00	1,61,943.00
MAIN CIRCUIT No. 4.										
Sekundrabad ...	31	7,372.30	1,410.30	446.37	618.12	377.65	476.80	378.70	1,864.20	12,947.30
Pyla ...	50	19,335.98	5,256.10	231.00	2,250.50	1,082.80	900.70	206.80	2,710.80	32,550.28
Dusars ...	34	13,800.82	1,139.20	403.80	1,082.50	333.10	396.90	801.53	1,207.90	19,323.84
Kurunpore ...	60	17,000.00	4,077.00	5,363.30	1,490.00	2,475.00	506.00	88.20	2,416.05	34,078.70
Portion of Allogunge ...	65	20,476.03	5,580.05	2,809.10	178.20	2,800.84	1,468.50	22.30	2,078.80	41,400.72
GRAND TOTAL ...	840	2,88,081.40	64,913.08	1,41,245.25	67,217.77	43,818.85	15,308.30	3,300.23	33,624.25	4,57,509.23

9. THAKBUST MAPS AND DEMARCATON.—The thakbust maps were carefully executed and agreed satisfactorily in boundary with professional. The demarcation on the ground is also stated to have been very good, except along waste land grants, where, says the Surveyor, "no boundary marks whatever had been put up by the grantees or their agents." This, of course, created delay and inconvenience, and "in many cases the exercise of the authority of the Deputy Commissioner had to be solicited before the survey of these allotments could be effected."

10. The maps and records of this party have not yet been received in this Office.

11. ASSISTANTS.—The Superintending Officer speaks in high terms of his Assistants and of his Establishment both as regards Field and Recess duties. He especially eulogizes Mr. C. W. Campbell.

12. AREA REMAINING FOR SURVEY IN MOHUMDEE.—"There now remains for survey in the Mohumdeo District about 1,970 square miles," of which about 1,200 square miles will be taken up during the present season, 1866-67, leaving only 770 for future operations and the party free to enter upon the survey of the Gonda District, which, with an area of 2,800 square miles, will take two or three years more.

Future operations. With the survey of the Gonda District the whole survey of Oudh will be complete.

13. Descriptive and other extracts from the Report of the Surveyor are appended.

SECOND DIVISION, OUDH.

14. FIELD OF SURVEY.—The main body of this survey, under the direction of Lieutenant-Colonel D. C. Vanrenen, entered upon the survey of the Baraitch district early in October,

Lieutenant-Colonel D. C. Vanrenen, n. a., Revenue Surveyor, on Special Duty, from 25th November 1865.

Captain A. D. Vaurenen, Staff Corps, Revenue Surveyor.

ASSISTANTS.

Lieutenant F. Coddington, Staff Corps, Assistant Revenue Surveyor, on sick leave for 20 months, from 10th December 1865 (supernumerary).

Lieutenant W. A. Franks, late 12th Native Infantry, Probationary Assistant Revenue Surveyor, resigned, 23rd February 1866 (*vide* G. O. G. G. No. 1562, dated 16th February 1866).

Lieutenant J. E. Sandeman, General List, Infantry, Assistant Revenue Surveyor, transferred from 2nd Division, Central Provinces, on the 17th February 1866.

Mr. W. H. Patterson, Assistant Revenue Surveyor, 1st Class, transferred from 1st Division, Oudh, on the 18th April 1866.

Mr. F. W. Kelly, ditto ditto, 3rd ditto, on deputation, from 18th April 1866.

Mr. W. S. Buttress, Sub-Assistant Revenue Surveyor, 2nd Class, transferred from 1st Division on the 18th January 1866, and re-transferred to 2nd Division, Central Provinces, on 22nd June.

Mr. J. Mills, Sub-Assistant Revenue Surveyor, 2nd Class.

Sergeant W. Street, ditto ditto, ditto.

Mr. T. Martin, ditto ditto, 3rd Class.

Mr. L. Evans, Junior Sub-Assistant Revenue Surveyor.

Mr. T. Patterson, ditto ditto, appointed on the 23rd April 1866.

40 Native Surveyors.

ant-Colonel D. C. Vanrenen, entered upon the survey of the Baraitch district early in October, while a small party, under Sub-Assistant Mr. J. Mills, was detached to survey the remaining portion of District Hurdul, alluded to in the Deputy Surveyor General's Report, 1864-65, para. 112.

15. CHANGE OF EXECUTIVE.—The work was fairly started by Lieutenant-Colonel Vanrenen, who, on being appointed to officiate as Boundary Commissioner of Bengal and Behar, was relieved by Captain A. D. Vanrenen on the 20th November (*vide* para. 111 of the Report).

16. PORTION OF TRACT.—The portion of the Baraitch District which came under survey lies between parallels 27° 06' and 27° 42' north latitude

„ Meridians 81° 17' and 81° 55' east longitude, and consists of

Pergunnah Hesampore	...	...	} Tehseel Hesampore.
Part of Ekowna	...	...
Pergunnah Baraitch	...	...	} Tehseel Baraitch.
„ Fukharpore	...	...

17. LIMITS AND AREA.—It is bounded on the south and south-east by District Gondah ; on the west by the surveyed districts Seetapore and Duriabad ; on the north, north-east, and north-west lie the unsurveyed portions of District Baraitch. It comprises 839 square miles, containing 872 villages.

18. DISTRICT HURDUL.—The Hurdul survey in Pergunnah Sandee contains 277 square miles and 231 villages, bounded on the north and east by the surveyed portions of District Hurdul, and on the south and west by District Furruckabad, along the whole face of which an overlap of half a mile was surveyed, and the positions of all prominent objects fixed by intersection for the purpose of forming as good a junction as possible with the old work of the north-west survey in that district.

19. LUCKNOW CITY EXTENSION.—On completing the Hurdul District, the party under Sub-Assistant Mills took up the survey of the suburbs of Lucknow on the scale of 8 inches = 1 mile, and successfully incorporated the new work with the former survey of the city in 1862-63. The environs included an area of about 4 square miles.

20. TOTAL AREA.—The season's out-turn comprises 1,103 village circuits and 1,120 square miles.

21. **STATE OF DEMARCATION.**—The demarcation was for the most part found in a satisfactory state ; masonry platforms had been erected at all village tri-junctions and masonry pillars at the sharp bends of boundary. The Settlement maps were rendered in good time, and agreed well with the professional maps, except in the northern portion of Pergunnah Baraitch, where the Surveyor reports the demarcations were very backward, and “in many cases the boundaries had not been settled and the thakbusts had not been completed.” The District Officers were prompt in rendering assistance and facilitating the progress of our survey parties. The settlement detail survey made vigorous efforts to keep pace with professional survey operations, and detailed areas of cultivation, waste, &c., were regularly furnished to the settlement ; but owing to the survey being far a head of the khusreh, only a partial comparison between the professional and khusreh detail measurements was made in the field.

22. **INTERMIXTURE OF PERGUNNAHS.**—The pergunnahs are very much intermixed in Baraitch at present, and require complete revision and re-distribution on the completion of professional operations. If pergunnah divisions are to be maintained at all, it is of consequence in the issue of final maps that their new limits should be quickly decided and fixed.

23. **CHECK SURVEY.**—Check lines were surveyed by European Assistants to test the accuracy of the interior survey, and proved, reports the Surveyor, the latter to have been carefully and correctly executed.

24. **CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.**—In the northern portion of Baraitch District two principal stations, Anarkali and Telakpur, of the north-east longitudinal series, afforded the means of checking the measurements. A comparison of the direct distance derived from Trigonometrical and Revenue Survey data shows the error of the latter to be only 4.36 feet per mile.

25. **ASSISTANTS.**—Captain Vanrenen reports favorably of all his Assistants, and makes special mention of Lieutenant Sandeman and Messrs. Patterson and Mills.

26. Much sickness prevailed amongst the European Assistants in the Recess, on account of which the work therefore told heavily on the remainder ; and it reflects great credit on Captain Vanrenen and his Assistants that the Recess work was turned out in such good style, and that the party took the field without any arrears.

27. **MAPS.**—The main Circuit Maps received in this Office are well finished, and excellent specimens of topographical drawing. The Baraitch (town and Civil station) plan on the scale of 8 inches = 1 mile has been very well drawn by Mr. Thomas Patterson.

28. **PROGRAMME FOR 1866-67.**—During the present season 1866-67, the Surveyor will complete the survey of the remaining portion of Pergunnah Fukeepore, bordering on the Gogra River and District Sectapore ; also the remaining portion of Pergunnah Ekownah, lying east of the previous season’s work, and bordering on the Gondah District and Nepal.

29. A portion of District Gondah, consisting of about 40 villages and running into, and interlaced with that of Baraitch, will also be taken up this season and surveyed.

30. After finishing the tracts thus indicated, east, west, and south, the same party will enter upon the survey of Pergunnah Nanparah, north of last season’s work, and extending thence to the Nepal Terai.

31. The estimated area of Baraitch remaining for survey is 1,800 square miles.

32. STATISTICS.—A detailed geographical and statistical account of the country surveyed in 1864-65 has been extracted from the Surveyor's Report and appended.

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

OFFICE OF THE SUPERINTENDENT }
OF REVENUE SURVEYS; }
Calcutta, 6th December 1866. }



APPENDIX.

Extract from Annual Report of the Operations of the 1st Division, Oudh Revenue Survey, by MAJOR F. C. ANDERSON, Season 1865-66.

16. GRANTS.—* * * * * Orleans cotton has been tried and promises well, especially on the Chander lands. These are open spots in the heart of the forests, lower than the surrounding ground on which the sal trees stand, and where only a few stunted sal and the wild date are to be seen. Rice is cultivated along the edge of the forest. Indigo is about to be attempted in the bed of the Ool Nullah, which runs through Grant No. 3 * * *

17. The Kutna and Burouchee Nullahs flow through main circuits Nos. 1, 3, and 4. Both are very treacherous from quagmires; their banks are prettily ornamented with cane brakes. In depth they vary, being in some parts so deep that alligators are seen in numbers, while at other places a pony can step across without wetting the girths. On the banks of the Kutna a tree grows called the Neura, which has the property of poisoning or drugging fish, and is used for the purpose by the villagers, who pound the bark and throw it on the water. The fish eat it and float on the surface either dead or stupified, in which condition they are collected by the fishermen. Both these nullahs feed the Goomtee, which rises at Madho Tanda, about 20 miles east of Pheeleebehet, and flows through the Mohumdee Tehseel, a clear, translucent stream. In the jheels and pools on its wide shelving banks wild fowl and snipe abound during the cold weather. It is a striking feature of this river that its left bank is dotted with sand hills of considerable height, round about which large herds of black buck congregate, while on the right bank there are no sand hills whatever and very few deer.

21. The two most remarkable objects met with during the past field season and noted upon the maps are the obelisk at Ourungabad, situated about 1 mile to the north-west of the town, and erected over 31 officers, ladies, and children killed on the spot during the Mutiny of 1857, a drawing of which done by Lieutenant A. D. Butter is forwarded; and the sacred tank at Gola, said to be one of the oldest places of pilgrimage and worship in Oudh, around which temples have been built, and large fairs are held annually in the months of February and March.

22. The road connecting Shahjehanpore, Seetapore, and Lucknow has been shown on the maps as an unmetalled district road, because, although it is at present the main line of communication between Rohilcund and Oudh, a new line has been marked out, upon which Imperial funds are being expended to a large extent, and which will be macadamized. It is anticipated that this new line will be completed in about two years, when the present road will be given up, and in the mean while it is kept only in such repair as is absolutely necessary for traffic.

23. SHAHJEHANPORE BOUNDARY.—The boundary pillars between the districts of Mohumdee and Shahjehanpore were found complete, in good order, and to agree with the thâk-busts of the Oudh villages; but this was only the necessary consequence of their having been

but lately put up by Mr. J. Cavanagh as a part of the demarcation of the Mohumdee District. No maps on the large scale appear to be in existence of the old survey of Shahjehanpore, and it has therefore been impossible to effect a comparison on the congregated village sheets of the common boundaries of conterminous villages along the frontier, or to ascertain whether the present demarcation between Oudh and Rohilcund exists the same as it was at the time of the old Nawabee. The old maps were not only much required by the professional survey for the purposes of comparison and connection, but by the Civil Officers for the settlement of boundary disputes. Application was made to the Civil Authorities of the Shahjehanpore District, and to the Secretary, Sudder Board, for copies of maps, on the largest scale extant, of the villages lying on north-west frontier; but the only one which could be obtained was furnished by the Board to the Chief Commissioner of Oudh on the small scale of 2 miles to the inch, which was perfectly useless for the reproduction of the old demarcation. That there must be just grounds for territorial disputes is apparent on a comparison of this map with those of the Survey of the past field season reduced to the same scale. A trace of the boundary between Mohumdee and Shahjehanpore, as shown by the two surveys, is appended to this Report, and it will be seen that the discrepancy in the outlines of all the villages is more than can be explained away as merely the accidental errors of drawing: and where the boundaries differ so much, the village areas must be sensibly affected. The position of the villages with reference to each other is in many cases quite different. Starting from the tri-junction of Districts Shahjehanpore, Hurdui, and Mohumdee, and following the Sukkithoo Nullah, the two maps correspond fairly up to the village of Sootnera; from this point the difference is striking and irreconcilable. The village of Ruksa is thrown a mile out of its true position, while the meridians laid down on the two maps differ by at least $2^{\circ} 30'$.

24. With such startling discrepancies between the maps of the two surveys and the disputes regarding the demarcation as it now stands upon the ground, it is useless to endeavor to effect any just settlement of questions on proprietary rights upon data procurable from any original survey records that are now forthcoming.

25. Mr. John Kavanagh, the Demarcating Officer, suggested, as the only true and practicable method of restoring the boundary between Oudh and Shahjehanpore, that the plans on scale 4 inches to the mile of the villages along this portion of the Rohilcund frontier should be made over to the professional survey for the reconstruction of the original boundary line.

If this very feasible and simple plan could have been adopted, all obstacles to a satisfactory connection of the maps of the two districts would have been easily removed; but, in point of fact, it appears that these are no plans of individual villages. These, it seems, were all destroyed with the 1 inch = 1 mile main circuit maps; therefore the difficulties of the question remain unsolved, while those of a peculiarly professional character must be again experienced by the 1st Division party during the operations of the coming field season, as that portion of the Mohumdee District which will next be taken up lies for 70 miles along the confines of Rohilcund.

26. It will be observed that a few of the 70 villages of the Shahjehanpore District surveyed during the past field season are defined by double lines. By this a disputed boundary is intended to be signified. Where the disputed area is considerable, as in the villages of Bupra in sheet No. 34 and Pudra Sikundrapore in Sheet 30, the word "disputed" has been printed; but where the question at issue concerned merely a few pillars, as in Goorree, the double boundary only has been shown.

*Description of the Country surveyed in the District of Baraitch, by CAPT. A. D. VANRENEN,
Revenue Surveyor, 2nd Division, Oudh, Season 1865-66.*

1. DESCRIPTION OF COUNTRY.—The tract surveyed contains the larger portions of the Tehseels of Hesampore and of Baraitch. It is bounded on the west by the Seetapore and Duriabad Districts, which have been already surveyed; on the south by the Gondah District; and on the east and north by the unsurveyed Pergunnabs of Nanparah and portion of Ekownah. The country is an open level plain, with a light sandy soil, intersected by numerous streams, with water in them throughout the year. It is beautifully wooded. In the rainy season it is subject to inundation, when most of the streams overflow their banks. To the south, on the Gondah boundary, it is well cultivated. In the Baraitch Pergunnah, to the north, cultivation seems neglected, and the greater portion is covered with long grass, the cause of which is attributable, I believe, to the dreadful anarchy and oppression which prevailed here before the annexation of the Province by the British Government; the Governor, Rugbur Sing, being so tyrannical, that he almost depopulated the country, and of whom it is written that “no oppressor ever wrote a more legible hand.” As the settlement was being made at the time of survey, the country was seen under its worst aspect, the policy of the people being to make it appear sterile and poverty-stricken, so much so, that although traces of irrigation were visible, one seldom saw it applied to the fields.

2. GROVES OF TREES.—No country could be more beautifully wooded than this part of Oudh; the numerous groves or topes of large mangoe and other trees which are everywhere met with form a picturesque feature in the scenery: some literally might shade an army. Their beauty has been oftentimes dwelt upon in the narratives of this country. Their grateful shade was very welcome to us at the commencement and end of the field season, and a Surveyor's tented home whenever met with was generally prettily situated in these topes; nearly every village having in its out-skirts one or more of them. Before the rains, when the mangoe fruit comes to maturity, it becomes almost a staple of diet with the people.

3. PRODUCTIONS.—The common cereals are much cultivated: here and there the rich luxuriant fields of man's favorite narcotic are seen, and the tobacco of this part is much esteemed. Oftentimes in the field adjoining, another favorite, the somniferous poppy, with its pretty white flower, grows, as the Opium Department has extended its labors to this district.

4. RIVERS, &c.—The Gogra partakes of much of the same character as other large Indian rivers,—in the rains a large swift running river, when it is navigable for boats of large tonnage; in the dry season it dwindles to, perhaps, a single channel, rendering navigation difficult. Its banks are here well defined. The set of the current about here is on the eastern bank. The survey of the eastern bank made in two different seasons showed but a slight change: the Buhram Ghât is one of the best crossings: a bridge of boats is erected generally early in November: in the rains good ferry boats ply on it: above its confluence with the Chowka River it is oftentimes called the Gunduk. The other streams, such as the Lurjoo, Tehree, Bhukoosur, and Sohtee Nuddees have clear, well-defined banks, and are subject to inundations. In the winter months, when the streams become small, temporary wooden bridges opposite large villages are erected across them to facilitate intercommunication. Small boats also ply on them, and this mode of transport is much used in carrying grain to the large river, by which it is exported to the Lower Provinces; and during the past season, although the spring crops were remarkably fine, the good grains were difficult to procure, owing to all having been sent by this water communication to the famine districts in Bengal.

5. **ROADS.**—The road from the Ghât to Baraitch is part of the imperial one from Lucknow, and was fairly commenced upon this spring, and the earth-work progressed rapidly; there will be great difficulty in metalling it, as kunkur is only found at a great distance from it. Over most of the large streams light wooden bridges had been erected in past years by the Local Committee; they were inexpensive, have lasted well, and reflect great credit on the designers. The roads leading from Baraitch to Gondah, Bhingah, Ekownah, and Kurnailgunge, and from the latter to the Ghât, are district ones repaired annually; raised in places and over the important streams, those light wooden bridges, described already, have been erected, or small boats are brought to ply on them.

6. **JHEELS.**—The Talab Bughel and Anarkulee Jheel are large expanses of water, formed by the drainage of the surrounding country; in the rains they are very large, and even in the winter are of some extent. Every variety of wild fowl abounds on them in the cold weather months, and they are favorite resorts for shooting parties.

7. **BARAITCH.**—The Head-Quarters Town is Baraitch, which is prettily situated on some high undulating ground, and the bungalows are mostly built on little hillocks. The usual Civil buildings either have been erected, or are in course of being built. Hardly a vestige of the temporary cantonments formed in 1858-59, remains. The city has a few pukka houses, but is mostly composed of small mud hovels; it is prettily wooded, and mangoe and tamarind trees abound in it. The bazar and main street, called after a former District Officer, Major Steele, is being greatly improved, and the houses along it are being rebuilt of masonry. On the outskirts and in Mouzah "Lingha Parasee" there is a Mahomedan shrine (called after Syud Salar, a Mahomedan martyr, killed in the 11th century when fighting against the Hindoos), at which there is held annually a large fair in the month of May, which attracts a vast concourse of people (Hindoos and Mahomedans) from all parts, who combine religious motives with trade. The khadims, or keepers of the shrine, being so numerous, the endowments received from rent-free villages and other sources go but a small way to satisfy them. The shrine was largely supported by the late Oudh Government, who kept up and repaired the numerous pukka buildings and gardens about it.

8. **KURNAILGUNGE OR SEKRORA.**—Of the old cantonments of Sekrora or Kurnailgunge hardly a trace remains, although a few hamlets, called after English names, show the position of some of the buildings and the Regimental lines. This place was abandoned in 1835, and is described as one of the healthiest places in Oudh. The security of living under our flag probably attracted numerous traders to reside here, and they and their descendants have made it one of the most important marts in these parts, and where every production of the country is readily obtainable. The bridged road which connects it with Buhram Ghât facilitates trade.

9. **HESAMPORE, TOWN OF.**—At Hesampore Khass the Tehseelee is placed in a small kutchabuilt building adapted for defence, but it is intended to remove it to a more convenient locality along the imperial road in course of construction. Dewa and Fukharpore are encamping grounds along the imperial road: at the latter there is a tope of trees, covering miles of ground. Karasurh Abhai, midway between the Ghât and Baraitch, is used as a halting place by travellers, and a handsome serai is being built for their accommodation.

10. **LARGE VILLAGES.**—Jurwul, Gungwul, Buhrapore, Pyagpore Khass, Bussuntpore, Kutrah Buhadoor Gunge, Raepore, Mahomednugur, Chundurkha Buzoorg, Sheoduha, are large villages for these parts, and a description of one village is applicable to all the rest. The houses in them are nearly all mud-built hovels; here and there a pukka house is met with

occupied by some man of note or a trader retiring to his birth-place to spend the fruits of his labors earned elsewhere. The villages are beautifully wooded, and above, or intermixed with the foliage, the spire of a Hindoo Temple, or Minaret of a Mosque often peeps out, giving them that picturesque appearance so taking to admirers of Indian rural scenery. At Jurwul, Pyagpore, and Gungwul, the Talookdars of those names reside, which gives them some local importance. The residences occupied by them are insignificant, and little better than those erected by their poorer countrymen.

11. DRINKING WATER.—The drinking water in the southern parts of the district is very bad, and numerous cases of Goitre, so distressing to see, are, I believe, its results. The better classes when within a few miles of the Gogra obtain their drinking water from it in preference to using the supply from wells.

Description of the Country surveyed in the Hurdul District, by MR. J. MILLS, Sub-Assistant Revenue Surveyor, 2nd Division, Oudh, Season 1865-66.

1. DESCRIPTION OF COUNTRY.—The country is level, well-cultivated, well-watered, fairly wooded, and possesses a light sandy soil.

2. RIVERS.—The principal rivers are the Ganges, the Ram Gunga, and the Gurrah. The Ganges here is shifting its bed rapidly towards the south; villages that ten years ago were three-quarters of a mile from the stream are now being undermined by it. From the same cause the right bank is sharply defined, being in some places fifty or sixty feet in depth and nearly perpendicular; but the left bank slopes gradually towards the river, and the country for two or three miles is subject to periodical inundations. The Ram Gunga and Gurrah have well-defined banks, and both are navigable for light barges throughout the year.

3. ROADS.—The roads from Sandee to Shahjehanpoor, to Hurdul, and to Bilgram, are partially bridged, in good order, and have a fair amount of traffic on them, but that leading to Furruckabad is very heavy in places, and is intercepted by the Ram Gunga and Gurrah Rivers. At each place ferry boats are in constant attendance.

4. SANDEE KHASS.—Sandee Khass is a flourishing town; near it there is an old Fort, which is now in a very dilapidated state; inside of it a fine large pukka bungalow has lately been built by the Opium Department, but it is not now used owing to the opium collections not being made any longer in this district: there is also a fine jheel near the town, to which shooting parties frequently resort in quest of the water-fowl, with which it abounds in the winter season. In the town there is a fair number of pukka houses; there is also a good serai and a Police station.

5. PRINCIPAL VILLAGES.—Dhurmpore, though small, is noted as being the residence of a loyal Rajah, Hurdeo Buksh; at Urwul he holds his kutchercee. Pulia and Dubilia are prosperous villages, and have fair bazars.

(True Extract and Copies.)

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

~~401~~ 402

No. 1.

FROM

THE OFFG. DEPY. SURVEYOR GENERAL OF INDIA,

To

THE SECY. TO THE GOVERNMENT N. W. PROVINCES.

Dated 6th December, 1866.

SIR,

Under instructions from the Government of India, contained in paragraph 4 of Home Department Orders No. 462, dated 2nd ultimo, I have the honor to submit the accompanying Report on the Revenue Survey Operations of the Rohilcund Division during the season 1865-66.

2. The total area completed in 1865-66 is 285 square miles, and the total expenditure Rs. 16,221-10-4, giving an average rate of Rs. 57-0-8 per square mile.

I have the honor to be,

SIR,

Your most obedient Servant,

J. E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

GENERAL REPORT
ON THE
REVENUE SURVEY OPERATIONS
OF THE
NORTH-WEST PROVINCES—ROHILCUND,

For Season 1865-66.

As stated in paragraph 135 of my Annual Report for 1864-65, the survey of the Rampoor Jagheer was concluded early in 1866. This little tract which completes the Jagheer, consists of Pergunnahs Putwai and Shahabad, bounded north by Rampoor (surveyed 1864-65); east by Barielly; west by Moradabad; south by Budaon. Operations were commenced at the end of October 1865 by Mr. Talbot, and continued by Mr. Campbell, who relieved him on 27th November 1865, *vide* paragraph 136 of the Report.

Mr. James Campbell, Assistant Revenue Surveyor, in charge.

Assistants.

Mr. C. Wilson, Sub-Assistant Revenue Surveyor, 3rd Class.
13 Native Surveyors.

Tract surveyed in Rampoor.

2. AREA SURVEYED, 1865-66.—Pergunnah Putwai and a small portion of				Square Miles.
Pergunnah Rampoor including the town, contains ...	...	...	...	137
Pergunnah Shahabad and River Ramgunga...	...	...	...	120
<hr style="width: 100%;"/>				
Area surveyed in 1865-66 ...	...	...	...	257
Area surveyed in 1864-65 ...	...	...	...	641
<hr style="width: 100%;"/>				
Total Area of Rampoor Jagheer ...				898
<hr style="width: 100%;"/>				

3. SCALE AND NATURE OF SURVEY.—The survey being purely Topographical, the whole area was sub-divided into 67 blocks, to establish a good check on the plane—tabling. Minute classification of soil was not attempted, but grass-lands and those which have been out of cultivation for a year or two years have been separately shown.

4. TOWN OF RAMPOOR.—A detailed re-survey of the town of Rampoor was not deemed necessary, or wished for, by the Nawab; the outer limits only therefore were surveyed and mapped, on the scale of 8 inches=1 mile.

5. DEMARCATION DEFECTIVE.—The Surveyor reports that, in this portion of Rampoor, village tri-junction points are not marked by masonry platforms, except along the outer boundary.

6. BOUNDARY BETWEEN BAREILLY AND RAMPOOR COMPARED.—Since the issue of the last Survey Report, the remaining Hudbust Maps of District Bareilly (*vide para.* 132)

have been received by the Surveyor, who writes—"I have been able to effect a complete comparison of the whole line (between Rampoor and Bareilly); the area has not undergone alteration, and may therefore be finally accepted."

7. CHECK SURVEY.—The check lines of survey gave good results.

8. SURVEY OF RAMPOOR COMPLETED.—The survey of the Rampoor Jagheer was brought to a close on 1st February 1866, and there being no more work ready in the plains, the party moved into Kumaon for the survey of waste lands and tea plantations.

9. KUMAON TEA ESTATES.—Here the Surveyor reports having labored under many difficulties; the work was received in driblets from the 5th February to 26th April. Some of the Planters altered their boundaries after survey, thus causing a re-survey; whilst others, he says, directly opposed the survey, until the season was too far advanced to admit of the details being taken up, and thus out of 27 estates only 15 could be completely surveyed in detail. The Statement A appended, shows the state of the survey of these grants. Difficulties were aggravated on account of the plantations being so widely scattered, and of the extreme scarcity of supplies and baggage coolies. Our men, moreover, unused to the climate of the hills, suffered severely from exposure during the months of February and March.

10. AREA OF PLANTATIONS.—The area of the 27 plantations above-mentioned is 28 square miles, all were surveyed on the scale of 8 inches Scale of Survey. = 1 mile.

11. RE-SURVEY OF THE NORTH-WESTERN PROVINCES.—The re-survey of the districts

* Under Orders of Government, Home Department, conveyed in No. 5447, dated 30th December 1865, to Secretary to Government North-Western Provinces.

of North-Western Provinces, of which the records have been lost, having been decided upon,* His Honor the Lieutenant Governor con-

curring in the Board's recommendation that the re-survey should commence with the Ro-

† No. 395 A, dated 28th May 1866, from Secretary to Government, to the Deputy Surveyor General.

hilkund Division, intimated his approval† of the Deputy Surveyor General's proposal to take District Bareilly first in hand. The other districts noted in the margin‡ will then be taken

‡ Budhon.
Moradabad.
Bijnour.

up in the order in which they stand, and as survey parties become available.

12. PROGRAMME FOR 1866-67.—It had been intended, for professional reasons, to

commence with Pergunnah Pillibheet at the North East corner of District Bareilly.

District Bareilly, and work down south. The Collector of the District, however, having represented that the unhealthiness of the Northern Pergunnahs renders it imprudent for European Officers to visit them until late in the season, and that it would be difficult to complete the Hudbust maps in time for the Professional Survey, Pergunnah Jehanabad in which all boundary disputes have been settled, will first come under survey.

13. CHARACTER OF RE-SURVEY.—The survey about to be undertaken is to be on the full scale of 4 inches = 1 mile, and minute in every detail, including boundaries of villages, excepting only that cultivation, fallow, and lately thrown out of cultivation, are to be surveyed, and included in one item under the head of "cultivation, including fallow and lately thrown out of cultivation."

14. SURVEY OF NYNEE TAL CONTEMPLATED DURING RECESS OF 1866-67.—A re-survey of the settlement of Nynee Tal, on a large scale, by this party having been sanctioned by

Government, in compliance with the application, and at the expense, of the Municipal Committee, an estimate of the cost* has been submitted to the Commissioner of Kumaon to lay before the Committee. On the estimate (which is extremely low) being approved of, the Surveyor will commence the survey on his return to Recces Quarters.

* Rupees 3,000.

15. STATISTICS.—Some brief extracts from the Surveyor's Annual Report, descriptive of the country, are given in the appendix, and will be found interesting.

J. E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

OFFICE OF SUPERINTENDENTS OF
REVENUE SURVEYS,
Calcutta, 6th December 1866. }

TABLE A.

Plantations Surveyed in District Kumaon.

No.	NAMES OF PLANTATIONS.	When received for Survey.	REMARKS.
1	* Raneckhel ...	5th Feb. ...	In those marked*, the tea lands are surveyed in detail, as well as roads, houses, patches of wheat and potato cultivation, land cleared of timber and otherwise prepared for tea.
2	* Doonagiri ... { Kuppultana Dodowlee }	" " ...	
3	* Jowna ...	16th " ...	In those marked †, only the boundaries, the general run of hills, and cultivation near the boundary were surveyed; of these 4, Julna is the only one which has tea on it, but the tea lands were not surveyed owing to doubt regarding the boundary.
4	* Kowsanee ... Pinglekot, &c.	" " ...	
5	* Kowsanee ... Mowlee, &c.	" " ...	In those marked †, only the boundaries, the general run of hills, and cultivation near the boundary were surveyed; of these 4, Julna is the only one which has tea on it, but the tea lands were not surveyed owing to doubt regarding the boundary.
6	† Kowsanee ... Sindoongree	" " ...	
7	* Dumlote ...	" " ...	In those marked †, only the boundaries, the general run of hills, and cultivation near the boundary were surveyed; of these 4, Julna is the only one which has tea on it, but the tea lands were not surveyed owing to doubt regarding the boundary.
8	† Lodh Chiddoo ...	" " ...	
9	† Lodh Mylkhal ...	" " ...	In those marked †, only the boundaries, the general run of hills, and cultivation near the boundary were surveyed; of these 4, Julna is the only one which has tea on it, but the tea lands were not surveyed owing to doubt regarding the boundary.
10	* Chowkooree ...	22nd " ...	
11	* Jaltola ...	" " ...	In those marked †, only the boundaries, the general run of hills, and cultivation near the boundary were surveyed; of these 4, Julna is the only one which has tea on it, but the tea lands were not surveyed owing to doubt regarding the boundary.
12	§ Beeneenag Bhuttygaon, No. 1	" " ...	
13	§ Do. do. No. 2	" " ...	Only the boundaries of the 3 Beeneenag Plantations § were surveyed, as the managers refused to allow the survey of the interior details.
14	§ Do. Khetolee ...	" " ...	
15	† Dunkirk ...	" " ...	The proprietor of the two † Lodh Plantations did not define their boundaries till very late in the season.
16	† Julna ...	" " ...	
17	* Ramgurh ...	" " ...	The proprietor of the two † Lodh Plantations did not define their boundaries till very late in the season.
18	|| Rackot (Captain Danscy's) ...	" " ...	
19	* Janolee ...	11th April ...	The proprietor of the two † Lodh Plantations did not define their boundaries till very late in the season.
20	* Seelungee ...	" " ...	
21	|| Philkholee ...	26th " ...	Those marked || not surveyed in detail, owing to the lateness of the season.
22	* Ooput ...	" " ...	
23	† Koompoor ...	" " ...	Those marked || not surveyed in detail, owing to the lateness of the season.
24	* Oorkhoolee ...	16th " ...	
25	* Bincoolee ...	" " ...	Only 15 Plantations have been surveyed in detail, out of the whole number (27).
26	* Bursar ...	9th " ...	
27	|| Mascti ...	" " ...	Only 15 Plantations have been surveyed in detail, out of the whole number (27).
UNSURVEYED PLANTATIONS In District Kumaon.				These could not be surveyed at all, owing to the opposition of the proprietor.
Rackot. Mr. Lyall's } Waste Land Grants Churapanee ... }			
In District Gurhwal.			The boundaries of these still unsettled.
Ranceke Scin } Zemindaree Lands Chonpta ... }			

J. E. GASTRELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

APPENDIX.

Extract from Annual Report of the operations of the Rohilkund Division Revenue Survey, by J. CAMPBELL, Esq., Season 1865-66.

RAMPOOR TERRITORY.

4. NUMBER OF VILLAGES.—Pergunnah Putwai contains 237 villages or separate hulkas, and Pergunnah Shahabad 150, but not separately surveyed, the average area of each being, in the former, 370 acres, and the latter 510.

5. GEOGRAPHICAL FEATURES.—The country has the appearance of a dead flat, and the only inequalities are to be found along the course of the Ramgunga River, where, owing to numerous and frequent changes in the channel, the land is not all of the same elevation; the silting up in part of the old beds of nullahs and former branches of the Ramgunga and Cosilla Rivers, has given existence to numerous jheels of various lengths, but all alike narrow, this is especially the case in Pergunnah Putwai; whilst in the southern portion of Pergunnah Shahabad no such peculiarities occur. Irrigation from wells and water-cuts, or “gools,” is practised in both Pergunnahs, the country being well watered, and as the soil is rich, the cultivation is luxuriant.

6. RIVERS.—The Ramgunga River, which flows in a south-easterly direction is the only river worthy of notice; it is fordable almost throughout during the dry season, when the water is reduced to some 30 or 40 yards in width; during the monsoons, or rainy season, however, it expands to an extraordinary extent, sweeping over all the contiguous low lands, and it not unfrequently happens that it changes its bed entirely. During the dry season, there is a bridge of boats near Shahabad on the high road to Rampoor, and another at Nubeegunj, for local convenience only. There is a ferry at Bhuya Nee gla.

7. ROADS.—This part of the country is tolerably well supplied with roads; the principal one is the high road from Moradabad to Barcilly, alongside of which the line of Telegraph runs; near Rampoor numerous other roads branch off from the main one, and connect it with the town, and at or near the village of Ujeetpoor (the ordinary encamping ground), there is a meeting of several, of importance; the Nawab's great triangular southern road starts from Ujeetpoor, southward to Shahabad, from thence in a north-westerly direction to Sephnee, and then back to Ujeetpoor; there is another cut road branching south-east from Shahabad.

None of the roads are metalled, however, and have nothing to recommend them beyond their straightness and their freedom from water crossings, the hollows and waterways being generally filled up.

8. TOWN OF RAMPOOR.—The town of Rampoor is situated about a mile north of the Ujeetpoor encamping ground, it is surrounded by a thick and high hedge of bamboos, which prevents any of the buildings within being seen from the country around; there are 12 gateways or entrances, all of which are guarded by sepoy.

The bamboo hedge is said to have been planted by Nawab Fyzolla Khan about a century ago, it has subsequently been alternately cared for and neglected, according to the caprice of the Nawab.

As a survey of the town itself was not required, the out-skirts only are shown on the map; the survey was carried up to the walls of the houses, though the bamboo hedge is ordinarily considered the town limits; owing to the height of the bamboos, it was found impossible to fix the position of large and conspicuous buildings by intersection from the exterior survey stations, and within the hedge all view of them was intercepted by the huts. The Nawab's Palace is situated about the centre, it is surrounded by a high pukka wall with the main entrance to the westward.

9. TROOPS.—The troops of the Nawab are scattered in and around the town of Rampoor, and have no general cantonment.

A squadron of Horse 100 strong, termed the Gurh-ke-Resala, is quartered within an old fortified square, situated near the Dawk Bungalow, a short distance north of the town.

Another Squadron of the same strength, and called the Ulleebux Resala, is quartered in the south-west corner of the town, and within the bamboo hedge, whilst a corps 300 strong, and termed the Sirdar Bahadoor Horse, is cantoned to the southward, not far from the Ujeetpoor encamping ground.

The Artillery and Infantry are located within the town in different places; there are about 12 guns altogether, and the Infantry varies from 500 to 800 men, the larger portion of them forming a Regiment armed, accoutred, and clothed in imitation of what a British Sepoy Regiment was about a quarter of a century ago. The present Nawab takes a great interest in his troops, and is trying to improve them.

10. CHIEF VILLAGES OR PERGUNNAH TOWNS.—Next to Rampoor the Pergunnah Town of Shahabad is the largest met with during the season's operations; it is very ancient, having according to Native tradition existed 1,000 years ago under the name of "Lakhoor," which was changed to its present one by its Mahomedan conquerors; it has a population of 8,000 of whom two-thirds are Mahomedans, and the remainder Hindoos.

The other places of note are, Putwai, Miluk, Sephnee, Dhukia, Mutkur, Khoop, Gungapoor, and Ujeetpoor.

11. THANNAHS AND TEHSEELS.—"Thannahs" are located at Shahabad, Miluk, Putwai, and Ujeetpoor; and "Tehseeldaries" in the two former.

WEEKLY MARKETS.—Weekly Markets, or Hauts, are held in Putwai, Shahabad, Ujeetpoor, Miluk, Khira, Pipla, Khoop, Gungapoor, Kukrowa, Rawana, Jaitolee, Sephnee, Shakurpoor, Matkur, Debea, Nugla, and Tanda.

DISTILLERIES.—There are Distilleries at Shahabad, Dhukia, Debea, Nugla, Nuyagaon Putwai, Ujeetpoor, Miluk, and several others on a small scale in other villages.

INDIGO FACTORIES.—There are small Indigo Factories belonging to the Nawab and superintended by an old Eurasian at "Bhetergaon", near Shahabad, and at "Sephnee" and "Mutkur."

12. CUSTOMS AND REVENUE, METHOD OF COLLECTING.—None of the taxes are levied direct by the Nawab or through his Officers, except in the case of sugar-cane, which cannot be cut by the cultivators, except under the superintendence of the Nawab's Officers, who control the manufacture of the sugar, and only permit the owner or cultivator to dispose of the fruits of his labor, after the exact amount of produce has been ascertained and the Nawab's

share in the profits realized. The land revenue, as well as every other description of tax is farmed, the contractor taking the entire responsibility and trouble of collection. Taxation was carried to an excessive extent during the reign of the late Nawab, Eusoof Allee. The present ruler has wisely abolished several of the petty and vexatious taxes which only irritated the people and were of but little profit.

13. CROPS.—In Pergunnah Putwai the ordinary crops are wheat, gram, cotton, and sugar-cane, and a little rice; the same is to be found in Shahabad, with this exception that sugar-cane is more generally cultivated. About a fourth of the culturable land being occupied by it, in no part of Rohilcund perhaps is the cultivation so luxuriant as it is in Shahabad; the country is a perfect garden during the winter months, and presents an appearance seldom witnessed in other parts of India; this Pergunnah is decidedly the richest of the Nawab's possessions.

14. RAILWAY.—A branch railway, supposed to be the one intended to traverse Azimgurh, Oudh, Shajehanpoor, Bareilly, and Moradabad, passes through the entire length of this Pergunnah, the earthworks have not yet been commenced upon, but as it has been well defined and marked out, it has been shown upon the maps.

15. POPULATION.—It would be extremely difficult to give even an approximate idea of what the population of the country amounts to, so very different are the villages in various parts of the same Pergunnah from each other, that even an attempt at enumeration by means of the number of houses would be fallacious. In the grass-lands contiguous to rivers, the villages consist for the most part of mere cattle sheds, and are consequently but thinly populated; on the other hand the large central villages, and specially those in which the Mahomedans predominate, the houses are smaller and are built closer together, and consequently each block occupies a proportionately smaller extent of ground. Shahabad which is a fair average specimen of the latter description of village, has a population of about 8,000 to 1,480 houses, or about 5 souls per house.

NUMBER OF HOUSES.—There are 237 villages in Pergunnah Putwai, containing 10,800 houses, giving an average of 46 to each; in Pergunnah Shahabad, the villages are fewer in number, but they are considerably larger, the total number of dwellings being nearly as great as Putwai, whilst the villages are only 150 in number, thereby giving an average of about 72. Excepting in the large or chief villages, where the Mahomedans muster strong, the Hindoos predominate in point of numbers.

(True Extract)

J. E. GASTRELL, *Lieut. Colonel,*

Ofg. Depy. Surveyor General of India.

46 409.

No. 1.

FROM

THE OFFG. DEPY. SURVEYOR GENERAL OF INDIA,

To

THE SECRETARY TO THE GOVERNMENT OF PUNJAB.

Dated 6th December 1866.

SIR,

Under instructions from the Government of India, contained in paragraph 4 of Home Department Orders, No. 462, dated 2nd ultimo, I have the honor to submit the accompanying Report on the Revenue Survey Operations of the North-West Frontier during the season 1865-66.

2. I append a Statement of maps of the Punjab which have been published during the past year, and of compilations in progress for publication.

MAPS LITHOGRAPHED.

General Map of the Punjab in 8 Sections, scale 8 miles == 1 inch.

Sections 1, 3, and 4 have been lithographed, and the proofs are under examination. Sections 2 and 7 have been transferred to stone in part.

Map of the North-West Frontier, Punjab, scale 16 miles == 1 inch; published.

Hooshyarpore District, scale 2 miles == 1 inch, with village boundaries; photographed, proofs under correction.

COMPILATIONS COMPLETED AND IN PROGRESS.

District Lahore, scale 2 miles == 1 inch, with village boundaries, prepared for photography, completed.

Delhi and Hissur Divisions, scale 2 miles == 1 inch, with village boundaries; completed, portions of the districts of Delhi and Rohtuck, the lapsed Jagheers, and Native States adjoining; remainder in progress.

Delhi and Hissur Divisions, scale 4 miles == 1 inch; completed, the districts of Delhi, Kurnal, Hansce, Umballa, Jagheers, and petty Native States; remainder in progress.

Index Map of the Punjab, scale 16 miles == 1 inch, in progress.

3. The total area completed in 1865-66 is 363 square miles, and the total expenditure, Rs. 58,879-6-6. The rate per square mile cannot be given, only part of the work being complete in detail; but it will be reported upon at close of the operations.

I have the honor to be,

SIR,

Your most obedient servant,

J. E. GASTRELL, *Licut.-Colonel,*
Offy. Depy. Surveyor General of India.

449 411

GENERAL REPORT

ON THE

REVENUE SURVEY OPERATIONS

OF THE

NORTH-WESTERN FRONTIER—PUNJAB.

For Season 1865-66.

NORTH-WESTERN FRONTIER.

COMMENCEMENT OF WORK.—This party started work in the Hazara District on the 1st November 1865; the great prevalence

Lieutenant-Colonel H. C. Johnstone, Staff Corps, Revenue Surveyor.
ASSISTANTS.
 Lieutenant W. Barron, Staff Corps, Assistant Revenue Surveyor.
 Mr. G. Houlden, Assistant Revenue Surveyor, 1st Class.
 Mr. W. Reguolda, Sub-Assistant Revenue Surveyor, 2nd "
 Mr. A. J. Gibson, ditto ditto 2nd "
 Baboo Hurce Sing ditto ditto 2nd "
 Mr. G. B. Scott ditto ditto 3rd "
 14 Native Surveyors.

of fever in Lower Hazara rendering it unadvisable to commence earlier.

2. **TRACT SURVEYED.**—The portion of the district which came under survey is situate between the parallels 33°44' and 34°11' N. Lat., and 72°35' and 73°19' E. Long. On the west runs the Indus, separating it from Peshawur; on the south it is bounded by Rawul Pindee; on the north and east lie the unsurveyed portions of the district.

3. **CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.**—A net-work of small triangles was thrown over an area of 775 square miles, the secondary G. T. Stations* affording a good check and connection.

4. **AREA AND SCALE.**—The cultivated valleys, comprising a demarcated area of 329 square miles and consisting of 255 villages, were surveyed on the full scale of 4 inches=1 mile. The topography of the triangulated hill portion remains to be filled in this season on the scale of 2 inches=1 mile.

5. **SURVEY OF THE LOONDKHWUR VALLEY SUSPENDED.**—It had also been the intention of the Surveyor to take up and complete a small portion (about 100 square miles) of Eusofzai remaining for survey in the Loondkhwur Valley, and which, owing to the then disturbed state of this portion of the frontier, could not be surveyed in 1864-65. The same cause

operating, it was again left in abeyance, and the establishment originally intended for this work was employed in making a minute survey of the Cantonments of Rawul Pindee and Campbellpore on the large scale of 12 inches=1 mile to enable this Office to comply with the requisition of the Secretary of State, as mentioned by the Surveyor General in paragraph 52 of his Report for

1864-65. The area of the two Cantonments is 347 square miles, including a mile of environs round each. The survey of Rawul Pindee, not only on account of its size, but the nature of the ground, was a difficult task; but which, judging from the inspection had of the exceedingly well-finished plans received, appears to have been very successfully accomplished.

Survey of Rawul Pindee and Campbellpore Cantonments.

† Rawul Pindee ... 26
 Campbellpore ... 8

6. CAUSES ASSIGNED FOR SMALL OUT-TURN.—The out-turn is very small in comparison with the ordinarily large area returns of this Office and his Party ; but the Surveyor says, truly, that, “ as regards triangulation and hill-work generally, a small area must be expected the first “ year”; for, “ I had not only to contend against the comparative inexperience of many, but “ the large scale on which the work had to be done affected the out-turn. During the “ ensuing season much more will be got through, as all hands have gained experience.”

7. BAD WEATHER.—Inclemency of weather impeded the progress of work during March, April, and May, and the Surveyor reports early in May that two Sickness amongst the party. Assistants, Messrs. Housden and Scott; one Sub-Assistant, Huree Sing, and others were laid up from the hardships they had undergone, and he was himself suffering from fever. Active operations in the field could, therefore, no longer be proceeded with, and the party retired to recess quarters.

8. CHECK SURVEY.—The interior detail survey was duly checked by European Assistants.

9. ASSISTANTS.—The Surveyor bears testimony to the efficiency and zeal of his Covenanted Assistant, Lieutenant Barron, as well as to the excellent and hardworking character of his Head Uncovenanted Assistant, Mr. Housden ; Mr. Sub-Assistant Reynolds is also favorably mentioned for his unremitting attention to his duties. No detailed account of the country under survey accompanies the Report of this Division, as the Surveyor states that, he intends submitting a comprehensive Statistical and Geographical Report of the whole tract of country on the completion of the survey, and that he is carefully collecting information to enable him to do so.

10. WORK FOR 1866-67.—The ensuing season's operations will be of the same mixed topographical and revenue character as the last. Whilst part of the establishment is employed in filling up the net-work thrown over the hills lying within last season's circuits, and completing the topography of that portion of the district triangulated east in advance during the year under review, the remainder will push on with the triangulation and survey of Upper Hazara towards the glen of Khagan ; camp out in the valleys when the snow falls, and await its melting to enable them to penetrate still further northwards and eastwards, and finally effect a junction with the points fixed by the Cashmere Survey party in 1861-2-3. The Cantonment of Abbottabad falls within the limits thus marked out, and will be surveyed on the large scale, 12 inches=1 mile. The survey of the Loondkhwur Valley, to complete the Eusofzai District, will be undertaken on the first favorable opportunity that offers.

OFFICE OF SUPERINTENDENTS OF }
REVENUE SURVEY ; }
Calcutta, 6th December 1866. }

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

FROM

THE OFFG. DEPY. SURVEYOR GENERAL OF INDIA,

TO

THE SECRETARY TO THE GOVERNMENT OF BOMBAY.

Dated 6th December 1866.

SIR,

Under instructions from the Government of India, contained in para. 4 of Home Department Orders, No. 462, dated 2nd ultimo, I have the honor to submit the accompanying Report on the Revenue Survey Operations of the Left Bank Indus, Sindh, during the season 1865-66.

2. The following Maps of the Sindh Revenue Surveys have been published during the past year, or are being compiled for publication :—

District Nowshera, scale 4 miles = 1 inch, lithographed and ready for issue.

Kurrachee Collectorate, containing the Districts of Kurrachee, Sehwan, Jhurruck, and Shahbunder, scale 4 miles = 1 inch, in progress. Outline of southern portion completed.

Province of Sindh, in Sections, scale 1 mile = 1 inch, with village boundaries, in progress.

3. The total area completed in 1865-66 is 3,005 square miles, and the total expenditure, Rs. 43,173-6-4, giving an average rate of Rs. 14-5-10 per square mile.

I have the honor to be,

SIR,

Your most obedient Servant,

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

GENERAL REPORT

ON THE

REVENUE SURVEY OPERATIONS

OF
SINDH,

For Season 1865-66.

LEFT BANK INDUS, SINDEH, SURVEY.

COMMENCEMENT OF WORK.—On the 1st November 1865 the Establishment started from its Recess Quarters, Kurrachee, for Hyderabad, where it was detained by the heavy amount of recess work of the previous field season until the middle of December, and it was not until the end of the month that the new work was fully in train.

W. Lane, Esq., Revenue Surveyor.		
	ASSISTANTS.	
Mr. E. Loftie, Assistant Revenue Surveyor, 2nd Class.		
„ J. E. Hodgson, Senior Sub-Assistant Revenue Surveyor, resigned 9th March 1866.		
Mr. H. Dowman, Sub-Assistant Revenue Surveyor, 3rd Class.		
Mr. P. Ford, Junior Sub-Assistant Revenue Surveyor.		
„ G. Barret, ditto	ditto	ditto.
„ J. Connor, ditto	ditto	ditto.
„ T. Dunne, ditto	ditto	ditto.
30 Native Surveyors.		

2. POSITION AND AREA OF THE DESERT TRACT.—The country which came under survey consists of two distinct tracts lying east and west of the intervening plains of Oomerkot. That to the east comprises the desert of Oomerkot of the Thurr Parkur Political Superintendency, situate between the parallels of $24^{\circ}43'43''$ and $25^{\circ}22'48''$ N. Lat., and meridians of $69^{\circ}35'32''$ and $70^{\circ}25'44''$ E. Long. It is bounded north and east by the surveyed portions of Thurr Parkur; west by Oomerkot (plains); and south by the unsurveyed portion of Thurr Parkur. It contains an area of 1,539 square miles. This was surveyed topographically only, on the scale of 1 mile = 1 inch.

3. POSITION AND AREA OF THE MOWZAHWAR TRACT.—That to the west includes the entire Talooka of Muhubut Dero, the remainder of Talooka Hyderabad, and part of Talooka Goonee of District Mahomed Khan's Tanda-Hyderabad Collectorate, lying between the parallels of $24^{\circ}56'$ and $25^{\circ}27''$ N. Lat. and meridians of $68^{\circ}19'$ and $69^{\circ}20'26''$ E. Long. On the north it is limited by District Halla and the surveyed portion of District Hyderabad; on the east by the Oomerkot Plains; on the west runs the Indus River, separating it from Districts Sehwan and Jharruck of the Kurrachee Collectorate; on the south lie the unsurveyed portions of District Mahomed Khan's Tanda, abutting on Shahbunder, of the Kurrachee Collectorate. The area of this tract is 1,466 square miles (including 37 square miles of the Indus River). This portion was surveyed in detail on the full scale of 4 inch = 1 mile.

4. NUMBER OF VILLAGES.—The season's operations, embracing 191 Dehs or villages, surveyed in 327 Traverse Circuits, Jagheers, and Ryotee Thaks or holdings, have been separately traversed in the western tract, whilst that to the east was covered by a net-work of 102 triangles.

5. CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.—The Great Western Longitudinal Series, traversing the season's work along its entire length, east to west, furnished a rigorous check, and formed the basis of the minor series, extended over the desert tracts.

The annexed Table exhibits the comparative results of the direct distances obtained by Great Trigonometrical Survey and Revenue Survey data, and clearly shows the complete and satisfactory connection established :—

NAMES OF SIDES.	Length in Chains by Great Trigonometrical Survey.	Length in Chains by Revenue Survey.	Difference per Mile.	Revenue Survey.
Ameer Shah T. S. to Jan Mahomed T. S.	754.24	754.42	1.17	+
Jan Mahomed T. S. to Khori T. S.	883.92	883.93	.00	+
Khori T. S. to Nidamanee T. S.	992.00	992.18	.18	+
Nidamanee T. S. to Hukimannee T. S.	922.08	921.80	1.60	—
Hukimannee T. S. to Alum Khan T. S.	861.68	860.08	9.80	—
Ditto. to Katbaman T. S.	887.28	887.15	.77	—
Ditto. to Naga Shah T. S.	752.48	752.33	1.05	—
Naga Shah T. S. to Kanad T. S.	1081.12	1081.54	2.0	+
Kanad T. S. to Katbaman T. S.	1044.32	1043.77	2.77	—
Katbaman T. S. to Naga Shah T. S.	750.40	750.32	.56	—
Ditto. to Alum Khan T. S.	837.04	836.75	1.82	—
Kanad T. S. to Rukrag (secondary T. S.)	1367.28	1367.71	1.64	+
Rukrag H. S. to Hyderabad Fort Tower	1183.92	1183.60	1.42	—
Ditto. to Naga Shah T. S.	1120.40	1120.90	2.35	+
Kanad T. S. to Dadoo Musjid (secondary)	200.24	200.40	4.15	+
Alum Khan T. S. to Joom Dome (secondary)	612.64	612.75	0.94	+
Katbaman T. S. to ditto	660.96	660.64	2.55	—
Ditto. T. S. to Beyla-ka-Musjid	201.36	201.13	6.02	—
Ditto. to ditto.	832.72	832.22	3.17	—

6. CONSPICUOUS OBJECTS FOR FUTURE REFERENCE.—Some of the principal District Roads were traversed, and District Bungalows, Mosques, and other conspicuous objects were carefully connected with the Main Circuits, with the Theodolite.

7. CHECK ON DETAIL SURVEY.—The interior work is reported to have been thoroughly tested by the European Assistants. The check lines, with route surveys, aggregating in the plains 213 miles and in the sandy desert 116 miles, proved on comparison that the detail survey had been executed with great care and accuracy. A still further check was exercised by the Surveyor and Assistants visiting the Interior Surveyors and examining their work on the ground. The following extract from the Surveyor's Report is satisfactory :—"The Engineer "for Canals in the Hyderabad Collectorate acknowledges the incalculable aid he has derived "from our General and Index Maps in the preparation of a canal map of his charge."

8. DEMARCATION.—The Surveyor also reports that the Thakbust Maps were received in good time, and were found to correspond well with the professional maps.

9. OBSTRUCTIONS.—Professional operations were partially obstructed in the latter part of the season, especially in Talooka Goonee, of which, says the Surveyor, "considerable portions are held by indolent Syuds, litigious Amils and Jagheerdars, in whose villages attendance was never forthcoming at the proper period, and much valuable time was in consequence lost."

10. CITY, TOWNS, AND CANTONMENTS.—The City and Fort of Hyderabad were surveyed on the very large scale of 16 inches=1 mile, for the purpose of more clearly depicting the narrow lanes and alleys of the former, and for its greater utility on this scale to the Civil Authorities. The cantonments were surveyed on the scale of 8 inches=1 mile, and so were the principal towns of the District, viz., Mahomed Khan's Tanda, Digree, and Golam Ali's Tanda.

11. MAPS.—As yet only the Index Map of this Party has been received, nor has any advice yet reached the Office of the despatch of the other maps and records which, owing to the enormous area surveyed yearly by this Party, have proved more than can be completed in

an ordinary Recess. This will be avoided in future. It is far better to take the field early than to remain out late.

12. ASSISTANTS.—Since last Report, a very favorable change is reported in the behavior of the members of this Party, and the Surveyor now, it is gratifying to observe, bears willing and ample testimony to the good conduct and zeal of his subordinates.

13. AREA REMAINING FOR SURVEY IN SINDH.—The area still remaining for survey in Sindh is estimated at 10,500 square miles, the survey of which will probably occupy a single Party three or four seasons.

14. WORK FOR 1866-67.—The Surveyor proposes to take up Talookas Buddeena, Bagaka Tanda, and remainder of Goonee, which complete the Hyderabad Collectorate, and which have all been demarcated; but the Acting Chief Commissioner of Sindh is anxious that the survey of Oomerkot should be proceeded with this season, as a general map of the country is much needed. This tract mentioned in the early part of this Report, as the "plains of Oomerkot," is in a fair way of being partially reclaimed by the Mithrow and Thurr Canals, which are in course of excavation. The villages or Mukkans have been demarcated with stone pillars, and the holdings or Thaks farmed out along the Mithrow Canal, but no Thakbust Maps have been prepared. The Political Superintendent considers that, as the villages have not been defined on the Mithrow and its branch canals, the preparation of Thakbust Maps ought to be deferred until the system of canals, now under execution, is carried out to the southern extremity of the Talooka. The Executive Engineer in charge of the canals states that they are not likely to be completed within three seasons.

15. In a professional point of view, there can be no question that the survey of this portion of Sindh should be deferred to the last moment, and when the survey could embrace the canals, define the limits of cultivation and village boundaries. The Acting Commissioner desires, however, that, pending the completion of the canal system, a Topographical Survey only should be made, the details of cultivation, &c., to be filled in hereafter by the Settlement Survey. In his opinion it is not at present necessary for the professional survey to lay down the cultivated area except in a general way, as "the tract may, until the completion of the canal system, be looked upon as a barren waste with no fixed cultivated area."

16. I have again strongly urged in my letter, No. 40, dated 1st December, to the address of the Commissioner in Sindh, that the survey be delayed until it can be effected in such manner as to afford first class maps, and thus avoid the expense of a double survey. But if the urgent want for a general map of the country be sufficient to induce the Commissioner to set aside the question of extra expense, then that a rough Topographical Survey be made now at the smallest possible expense, defining roads, rivers, and sites of villages, and only such other topographical features as will suffice for the preparation of a general map on scale of 4 miles=1 inch. The regular Revenue Survey to follow hereafter, when demarcations are finished, and the line of canals finally determined and marked out, if not finished.

17. STATISTICS.—In the Appendix will be found a detailed description of the Hyderabad and Muhabut Dero Talookas.

OFFICE OF SUPERINTENDENTS OF
REVENUE SURVEYS;
Calcutta, 6th December 1866. }

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

APPENDIX.

Extract from Annual Report of the Operations of Left Bank Indus, Sindh, Revenue Survey,
by W. LANE, Esq., Season 1865-66.

TALOOKA HYDERABAD.

DISTRICT HYDERABAD.—Talooka Hyderabad forms a small district by itself, which is administered by the Deputy Collector in charge of the Civil Treasury under the immediate supervision of the Collector. Its extreme length and breadth are 28 and 19 miles respectively, and it is situated between the parallels of north latitude $25^{\circ} 10' 27''$ and $25^{\circ} 34' 15''$, and

Situation of the Talooka. the meridians of east longitude $68^{\circ} 21' 30''$ and $68^{\circ} 39'$, and is bounded to the north by the district and Talooka of Halla; to the east, by Talooka Alah Yarka Tanda, also of the district of Halla, and Talooka Muhubut Dero, of district Mahomed Khan's Tanda; to the south, by Talooka Goonee of district Mahomed Khan's Tanda; and to the west, by the River Indus, across which is situate the Talooka of Kotree, District Sehwan, Kurrachee Collectorate.

LOCAL SUB-DIVISIONS.—This Talooka comprises 66 Dehs, and covers an area of 2,46,425 acres=384.59 square miles, of which 41,487 acres=64.82 square miles were under cultivation.

AREA OF THE HILL TRACT.—A portion of its area=50.41 square miles, extending from a short way south of the cantonments and city to the confines of the southern boundary of the Talooka, is covered by barren limestone hills.

These hills rise abruptly towards the river, possess extensive plateaus about the centre, and gradually subside eastwards, on which side many of the narrow valleys fill with water during the inundation, forming little lakes, some of which on being drained dry up in the cold season and afford crops of wheat and pulses.

CANALS.—The Talooka is watered by the Fulailee, the Surfraz, the Nusseer, the Manuk, the Dadro, the Sind, the Noor, and the Jam Wahs, with their branches.

SOIL.—The soil is alluvial, and for the most part of good quality.

CROPS.—The crops consist, in the "Rubbee" season, of wheat, gram, peas, jamba, suro, &c.; in the "Peshrus," of cotton, indigo, and moong; in the "Khureef," of joar, bajri, till, &c.; joar and bajri being the staple produce; 3,164 acres yielded cotton.

CITY.—The city of Hyderabad covers an area of 233.30 acres, and stands on a rocky plateau, an offshoot of the range of limestone hills to the south, referred to in a preceding para. It is said to have been founded by Goolam Shah in the Hijra year 1171, corresponding with the Christian Era 1757.

Though called a pukka city (every mud-built habitation in Sindh is considered pukka, and only habitations made of matting and the boughs of trees are looked upon as "kutchra"), it is composed, for the most part, of houses of wattle and dab. A new quarter has been added by our administration, of regular built shops and streets; but it does not appear to have met with much favor from the people.

During the time that the Tulpoor Meers and their predecessors, the Kulhoras, held the country, it was considered the chief town of the province.

FORT.—The fort, which stands to the south of and in immediate proximity of, or connection with, the town, was built by Goolam Shah in the same year as the city. It is now used as the principal Arsenal in Sindh. The heavy and unprecedented rains, which poured down here last year, were the means of crumbling down some portions of its outer facing to the south and west, and though it may have been considered impregnable against native hordes, it is doubtful whether it could stand a long siege against an European army.

GARRISON.—In former times Hyderabad was garrisoned by a full Brigade; but the completion of the Railway from Kurrachee to Kotree, on the opposite bank of the Indus and only four miles distant, renders so strong a force no longer necessary. Since the mutinies, the following has been about the average strength of troops stationed in the cantonments:—

From two Companies to a Wing of an European Regiment of Infantry, a Troop or Company of Artillery, and a Regiment of Native Infantry.

MILITARY BARRACKS.—The barracks for the European Troops are both spacious and airy. It was here, I believe, that Sir Charles Napier first showed his great interest in the welfare and comfort of the private soldier, by providing him with spacious barracks and reserved suites for the married. The former cantonments were situate in the vicinity of the river, where much sickness was the natural sequence, which led to their abandonment, and the selection of the high plateau on which they now stand.

PUBLIC BUILDINGS.—The civil public buildings in the station consist of a Collector's and Magistrate's (large) Cutcherry, the Civil and Sessions Judge's Court, and the Treasury Office being also located therein within smaller buildings in the compound for the Moonsiffs and Mookhtyarkars' Offices and Police Guard, a recently built Court-house for small causes, dwelling houses (Government) for the Collector, the Judge, and the Treasury Officer, a Telegraph Office, and a Travellers' bungalow. All these are in close proximity to one another, and to the Military lines or Officers' bungalows. It would be as well to mention here that, besides a house furnished with tables and chairs and bedsteads, and a peon who is bound to render any assistance in his power, nothing need be looked for by a traveller resorting to the Travellers' bungalow.

In an easterly direction, and distant $3\frac{1}{2}$ furlongs from the Collector's Cutcherry, on the verge of the second range of the barren rocks, immediately abutted by the town behind, is a large building used as the Civil and Police Hospital. To the north of this, and on the brink of the same ridge, are to be seen several bungalows formerly occupied by European Officers, one of which has been recently used as a Normal School for Natives. Further north, on the same hill where the town ceases, several bungalows (in Civil limits) are observed, with a building centring the cluster, in appearance resembling a Chapel or a Mofussil Church; but instead of proving such, it is found to be an English School for Native children; to the south of this building, and only with the Mission compound intervening, stands the Post Office, and forming with them the apex of a triangle, is a substantial Mission School; to the north of this again, and after passing one bungalow to the right of the road, has recently been erected a bungalow for an Engineering School, at a cost of some 7,000 Rupees, which might have been run up in former times at less, perhaps, than the third of this cost; proceeding further in the same direction the Jail is encountered.

Within Military limits and the vicinity of the Officers' bungalows, near the side of the first hill rising from the plains, stands the Protestant Church, whilst the Catholic Chapel is about a mile eastwards on the same plateau, at the foot of the second range of hills, and situate between the Military Sudder Bazar on one side and the city on the other. A Pro-

testant Chaplain and a Roman Catholic Priest are attached to the station ; besides, an ordained member of the London Church Missionary Society is always at hand to officiate in the Chaplain's absence.

HYDERABAD AS A COMMERCIAL TOWN.—Hyderabad is the centre of a large local traffic. It is wonderful to see the strings of camels that issue from it and proceed to all the eastern parts of the province towards the spring. Grain, the staple food of the districts, is absolutely, at all periods, cheaper at Hyderabad than in the villages where it is sown and reaped ; this is strange, but nevertheless an undeniable fact, and the only way in which it can be accounted for is, that the wealthier dealers or Banians buy up the crops for delivery at Hyderabad long before the seed has even been sown ; for, as soon as it has been reaped, boats filled with it wend their way, from all directions that water communication will admit of, to Giddo Bunder, the Port of the place ; and from other parts camels come laden perhaps with bajri, the great staple food, to be re-transported to the very places again in the course of a short period.

IMPORTS.—The imports are, besides grain, coarse cloth and rock salt from the Punjab ; English piece goods, iron, hardware, and other articles, to a limited extent ; Bengal and Mauritius sugar, Muscat dates, &c., from Kurrachee.

EXPORTS.—The exports consist of the same materials forwarded on in an opposite direction.

ROADS.—It being the Head Quarters of the Collectorate or Division, it must be naturally inferred that numerous roads fork out in all directions from Hydrabad. The station roads are metalled, and, generally speaking, kept in good order ; but the district roads are, for the most part, heavy and much cut up after the rains. Except on the two main lines, the one leading to Mooltan and the other to Oomerkot, which are now bridged, the others are intersected by deep canals with steep sides, making it difficult for a wheel conveyance to pass across, and by no means easy for laden camels whose loads are liable to be tilted over.

MEANS OF TRANSPORT.—It is only in the cold months that camels are extensively employed ; during the flood season, boats are able to ply along the canals all over the country.

VEHICLES PLYING FOR HIRE AT THE STATION.—Four years back, when we first came to this station, there was but one horse-vehicle, and that of a singular construction, with a spavined tattoo, to be seen plying for hire to the river ; now, phaetons, palkee garries, and dog-carts are so common that natives with rags on, or even no rags to their backs, may at times be seen riding in them.

TRAITS CHARACTERISTIC OF THE SINDEE.—The Sindee, as a rule, is most improvident, and in this respect so unlike his countrymen of Hindoostan, that if he has but 2 Rupees or 2 Annas in his pocket, and is desirous of proceeding respectively to Kurrachee or Kotree, he will part with his all to pay his fare per railway or carriage rather than trudge it out. The native of Hindoostan, on the contrary, even to this day, if his means be small, marches down to Kurrachee and frequently earns a few Rupees along the road, as some desultory works are sure to be going on along the Railway line at the best of times.

TOMBS OF THE KULHORA AND TALPOOR CHIEFS.—On the higher range or plateau of Hyderabad stand several conspicuous Mausolea, covering the remains of the Talpoor Ameers and of some of the Kulhora Princes who preceded them. Some of these tombs, inside, are of chaste workmanship in alabaster. A few of the older ones are held in some veneration, and people flock to them at certain times of the year.

CLIMATE.—The climate of Hyderabad is considered, on the whole, tolerably healthy. During the cold months it is bracing; from the middle of April the hot weather sets in, and usually lasts to the beginning of September, which is a pleasant though not a healthy month. But even during the hot weather, the nights and mornings are cool; the days, after the high S. W. Monsoon breeze sets in, are also in a slight measure tempered by it, coming, as it does, across the Arabian Sea before reaching land; the evenings are much more bearable here than they are in the North-West Provinces and the Punjab or Upper Sindh, during the same period; but some really hot days are felt both here and at Kurra-
 Diseases. chee at times. Fevers are very rife in October and the succeeding month. Liver complaints are also very prevalent in the hot season.

SCARCITY OF GOOD WATER.—Both the cantonments and the city of Hyderabad suffer much, for some period before the coming on of the floods, from the want of good water. From the putrid water used by the people of the city for the greater part of the year, it is a matter of surprise that endemics are not more general. With a little expense a perennial canal may be made to traverse both the sides of the cantonments and the city.

The new Fulailee, which would probably require deepening by a few feet to answer as a feeder for two narrow but deep cuts, skirting the cantonments and city, and finding their way through some of the old channels to the Indus, away to the south, would, perhaps, answer the purpose of supplying a perennial stream.

Colonel John Jacob, so well known as the Commandant of the Sindh Irregular Horse, whilst stationed here, dug a tank and well, still known after his name, whence the troops derive all the water for their consumption.

This source, in a great measure, fails from the beginning of the hot season to the rising of the Indus to such a height as to fill canals but 4 or 5 feet deep.

MANUFACTURES.—Hyderabad is noted for its embroidered work and lacquered-ware, specimens of which have been recently forwarded for exposition at the "Paris Exhibition" of 1867.

TALOOKA MUHUBUT DERO.

This Talooka belongs to the District of Mahomed Khan's Tanda, and is situate between the parallels of North Latitude 24°58'52" and 25°17', and the meridians of East Longitude 68°34'30" and 69°26'25"; and is bounded on the north by Talookas Alah Yarka Tanda, and Meerpoor of the Halla District; to the east, by Talooka Oomerkot of the Thurr Parkur Political Superintendency; to the west, by Talooka and District Hyderabad, and Talooka Goonee; to the south, by Tal-baga-ka-Tanda.

This Talooka has a straggling figure, and measures across from east to west about 48 miles, and at the widest part 23½ miles. It is divided into four Tuppabs and 66 Dehs, of which four are Jagheers; and there are besides 53 Jagheer holdings of minor note scattered over the face of the Talooka.

The area of the Talooka is 438,094.94 acres = 684.52 square miles, of which only 34,058.48 acres were found under cultivation by the survey; of this, 1,975 acres were, according to the Revenue Officer's report, taken up with cotton.

The Head Quarters of the Talooka are at Diggree, an ill-chosen position, being surrounded by a vast plain producing scanty crops, whilst the richest portion of the Talooka lies towards the opposite extremity.

Goolam Ali's Tanda, Mathullee, Jan Mahomed, Sheikh Bhirkia, and Muhubut Dero are, besides Diggree, the principal villages in the Kardarate.

The chief canals by which it is watered are the Purwah, the Ali Bahir Wah, the Emam or Mussoo Wah, the Manuk Wah, the Moolchund, the Nusseer Wah, and their branches.

The Bombay Dâk Road passes through a part of the Talooka, by Sheikh Bhirkia, Goolam Ali's Tanda, Diggree, and Jan Mahomed. Other district roads intersect the Talooka, which are, for the most part, passable for wheel carriage.

The crops consist of—in the "Rubbee"—wheat to a very limited extent, gram and pulses; in the "Peshrus," moong, till, melons, &c.; in the "Khureef," joar, bajri, rice, &c.

The soil for the most part is good.

Much jungle prevails in the low localities, where the water lodges during the flood season.

TALOOKA GOONEE.

Of this Talooka only about a half, embracing two circuits, was surveyed. Although entered late in the season, especially towards Dhundee, were found still under water and did not dry up till April.

(True Extract)

J. E. GASTELL, *Lieut. Colonel,*

Offg. Depy. Surveyor General of India.

FROM

LIEUTENANT-COLONEL D. C. VANRENEN, B. A.,

Officiating Superintendent of Revenue Surveys, Bengal,

TO

THE SECRETARY TO THE BOARD OF REVENUE,

LOWER PROVINCES.

OFFICE OF SUPDT. OF REVENUE SURVEYS,

Calcutta, 11th December 1866.

SIR,

FOR the consideration and orders of His Honor the Lieutenant

* 1st Division, Lower Provinces.

2nd Ditto, ditto.

3rd Ditto, ditto.

4th Ditto, ditto.

5th Ditto, ditto.

6th Ditto, ditto.

Darjeeling Revenue and Topogra-

phical Survey.

Upper Assam Ditto, ditto.

Governor, I have the honor to submit, the results of the Revenue Survey Operations in Bengal, for the Survey year 1865-66, which commences on the 1st October 1865, and terminates on the 30th September 1866. The usual Tables are also included, for the eight Divisions,* as noted in the margin.

2. In obedience to the orders of the Government of India marginally

Home Department, No. 1805,
dated 23rd February 1866.

cited, I received charge of the Office of Superintendent of Revenue Surveys in Bengal, on the 26th February 1866, from Lieutenant-Colonel Gastrell, having likewise relieved that Officer of the Boundary Commissioner's Office in November 1865, in accordance with instructions contained in letter No. 6192, dated 7th November 1865, from Secretary Government of Bengal.

3. The results for the past season show an area of 39,11,714 acres, or 6,110 square miles, accomplished in the Districts of Kamroop, Manbhoom, Sylhet, Cachar, Tirhoot, Patna, Lohardugga, and Western Dooars, including an area of 885 square miles of Topographical Survey of portions of Chittagong, Darjeeling, Dalingkote Sub-Division, Western Dooars, and Sebsaugor.

4. The total expenditure, including travelling, and all contingent expenses, having been Rupees 3,47,156-13-4, will yield the general average per square mile of Rupees 56-13-1.

5. The above when contrasted with the previous season is as follows :—

Survey Divisions.	Districts in which employed.	No. of Villages or waste land blocks.	Square miles.	Expenditure.			REMARKS.
				Rs.	As.	P.	
1st Division	Kamroop	769	986	48,346	7	9	Mouzawar Area ... 5,225 Square miles. Topographical &c., 885 6,110
2nd do.	Manbhoom	941	1,034	50,539	10	5	
3rd do.	Sylhet and Cachar	375	388	53,138	0	9	
4th do.	Tirhoot, Patna, &c.	1,657	1,228	47,660	8	9	
5th do.	West Dooars & Chittagong	193	1,006	43,459	4	5	
6th do.	Lohardugga	863	835	60,678	1	9	
1st or Darjeeling do.	{ Darjeeling, Dalingkote } Sub-Division, and { Western Dooars	103	391	22,547	8	0	
2nd or Upper Assam do.	Sebsaugor	37	242	19,170	1	0	
Total	4,938	6,110	3,45,539	10	10	The 3rd or Lower Assam Survey has partaken more of an exploration than a regular Survey. There is, indeed, no return of area vide paras. 119 to 126 of accompanying Report.
Mehalwary charges ... ..	...	...	...	1,617	2	6
Grand Total for 1865-66 ... ..	...	...	6,110	3,47,156	13	4
Do. do. 1864-65 ... ..	...	...	7,857	3,51,743	10	8
Difference	1,747	4,586	13	4	

6. Both as regards area surveyed and the rate per square mile, the comparison is in favor of 1864-65. The mileage rate, Rupees 136-12-4 of the 3rd Division especially, has been very high, owing to the defective state of the demarcations. The Surveyor, indeed, having in most cases proceeded without them, rather than suspend operations altogether. It appears that the boundaries of Estates which had been defined in 1862, 1863, 1864, and a few also in 1865, had been swept away by the heavy rains, or otherwise destroyed, and as they had not been re-placed when the survey arrived, there were no land marks to guide the Surveyor. This is to be regretted, because out of sixty-seven Grants taken in hand, the survey of sixteen Grants only can be declared as completed.

7. I desire to draw the attention of the Government to the fact that, though permanent masonry platforms appear to have been erected in certain villages in Assam, they are not so in all, and those that have been erected, are reported by the Surveyor, as fast falling to pieces. The subject is a serious one for the future, as on the stability of these marks, much of the future utility of the survey, now in progress, depends.

8. But although the high rates and decreased area, are due chiefly to want properly demarcated boundaries, they are also partly due to a very exceptional season of much sickness, among both the European and Native members of the several establishments.

9. Another district of Bengal, Sylhet, has been completed during the year, with the exception of the boundary along the Cossyah Hills, which will be finished during the field season of 1866-67. A small portion only of the Manbhoom district too, remains for completion, for which a party of the 2nd Division has been detached; the Head Quarters under Captain D. Macdonald, having left on the 30th ultimo, to commence operations in the district of Luckimpore, Upper Assam.

10. The Topographical Survey of district Darjeeling is also completed, with the exception of the Hope Town Estate, for the survey of which the planters refuse to pay.

11. The labours of the Boundary Commissioner's Office are separately detailed, in the letter appended to this Report.

12. The following Statement affords the necessary information respecting the total area, cost, and average rate per square mile of the Sylhet district, which has been completed during the season under report:—

District.	When commenced to be surveyed.	When finished.	By whom surveyed.	Area in		Cost inclusive of contingent expenses.	Rate per		
				Acres.	Sqare miles.		Square mile.		
Sylhet	Season. 1860-61.	Season. 1865-66.	N. T. Davey, Esquire	31,88,526	4,982	2,13,996	42	15	3

I have the honor to be,

SIR,

Your most obedient Servant,

D. C. VANRENEN, LT.-COL.,

Offg. Supdt. of Revenue Surveys, Bengal.

GENERAL REPORT
ON THE
REVENUE SURVEY OPERATIONS OF THE LOWER PROVINCES
FOR
SEASON 1865-66.

1st DIVISION.

LOWER PROVINCES.

As stated in para. 24 of the Bengal Revenue Survey Report of 1864-65, this party, after

COMMENCEMENT OF WORK.

- R. B. Smart Esq., Revenue Surveyor.
Assistants.
Mr. J. R. Pringle, Assistant Revenue Surveyor, 1st Class.
" D. W. Burnett, Assistant Revenue Surveyor, 3rd Class.
" C. Brownfield, Assistant Revenue Surveyor, 3rd Class, rejoined from 2nd or Upper Assam Survey on the 9th March 1866.
" E. J. Jackson, Sub-Assistant Revenue Surveyor, 1st Class, transferred from Presidency Office, 18th August 1866.
" J. D. Lynch, Sub-Assistant Revenue Surveyor, 2nd Class, transferred to Upper Assam on the 9th March 1866.
" R. B. Smart, *junior*, Junior Sub-Assistant Revenue Surveyor, 2nd Class.
" W. J. Lane, *junior* Sub-Assistant Revenue Surveyor, 2nd Class.
" R. C. Ewing, Junior Sub-Assistant Revenue Surveyor, 2nd Class, appointed on the 9th June 1866.
25 Native Surveyors.

completing district Noacolly, entered upon the survey of district Kamroop, Lower Assam. The Surveyors left Dacca, their Recess Quarters, early in November, and arrived at Gowhatty on the 13th December 1865. Work was fairly started on the 19th December 1865,

and continued uninterruptedly till the beginning of June 1866.

2. The portion of the district which came under survey lies North of the Bhrmapootra river, extending from Gowhatty on the East, to Gowalpara on the West. On the North are the unsurveyed portions of Kamroop.

POSITION OF THE TRACT.

3. The Hatimora hill station was adopted as the origin of survey, and the work was based upon five principal and eight secondary stations of the Assam Longitudinal Series.* Fourteen temples and conspicuous objects were carefully fixed by triangulation, thus materially enhancing the value of the work.
- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <p>CONNECTION WITH G. T. SURVEY.</p> <p>4 Hatimora.
Bachho.
Baikusni.
Nagarbera.
5 Duramari.
Gowhatty Church.
Burpetta.</p> | <p>Chalda.
Fulora.
Gowalpara.
Satali.
Mattia.
Dolgema.</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|

4. The gross area surveyed was 986 square miles, including river area, and containing 769 villages divided into three Main Circuits and five river circuits. Considering the sickness which prostrated the party in the field, and the difficulties ever attendant upon the commencement and prosecution of operations in a new district, this outturn is excellent, and reflects alike on the energy and good management of the Surveyor and the zealous co-operation of his assistants.

AREA SURVEYED.

5. The Surveyor reports that more than 100 men were admitted into hospital, out of which number two Native Surveyors and six Measurers died. The members of the party also suffered during recess at Gowhatty, and Mr. Sub-Assistant Lane was compelled to take three months' sick leave.

SICKNESS IN THE PARTY.

DEATHS.

three months' sick leave.

6. The defective state of the demarcations was another source of embarrassment to the Surveyor, and seriously interfered with the rapid progress of survey operations. The Thakbust maps were furnished in time, but were of little use as a guide to the Surveyor, as the marks

DEMARCATIONS.

on the ground did not, as a rule, accord with those shewn on the Thakbust maps. Early in May the fact was brought to the notice of the Deputy Collector (who is in immediate charge of the settlement,) as well as to that of the Deputy Commissioner, and maps of the discrepant villages were returned to the Civil Branch, for adjustment. The Surveyor reports that "new land marks were not erected, but the professionally surveyed boundaries were transferred to the Thakbust maps." The check usually exercised by the settlement on the professional boundary was thus nullified, and the Surveyor had, therefore, no alternative but to accept his own boundary survey as correct. As distasteful as it is to reflect on another Department, it is necessary here to record the circumstances connected with the demarcations in Kamroop, in order that no blame may attach hereafter to the professional operations in the district.

7. The detail survey was thoroughly verified by European Assistants, who ran check lines across the work. The comparison is reported to have been highly satisfactory. The Revenue Surveyor has recorded the hearty co-operation he has received from the Deputy Commissioner of Kamroop, and to its having in a great measure, contributed to the completion of the season's work.

CHECK SURVEY.

The Native Surveyors are likewise said to have worked well.

8. The Surveyor speaks in favorable terms of his Assistants, as indefatigable in Field and Office. The Native Surveyors are likewise said to have worked well.

ASSISTANTS.

9. The maps of the season's operations have all been lodged in this Office. They are very neatly and clearly executed in pen and ink, and are admirably adapted for reproduction by Photography.

MAPS.

10. The work for the ensuing season adjoins that just done, to the north, and extends to the Doars Bijhee, Chapagoora, Baskah, and Gurkhula. The Moojmillee or congregated village map and lists of villages have been received, and the Thakbust maps are daily expected.

PROGRAMME FOR 1866-67.

The demarcation Officer has been requested to depute a party of Ameens to see that the land marks are intact; and there is ground to hope that the difficulties which beset the professional survey last season will not be encountered again, and that a large outturn will result.

STATISTICS.

11. Extracts from the Surveyor's Report will be found in the Appendix.

2ND DIVISION.

LOWER PROVINCES.

WORK RESUMED.

- Captain D. Macdonald, Staff Corps, Revenue Surveyor.
- Assistants.*
- Lieutenant R. C. Bevan, late 62nd Native Infantry, Probationary Assistant Revenue Surveyor, removed from the Department on the 8th December 1865.
- Mr. G. H. Blyth, Assistant Revenue Surveyor, 2nd Class, transferred from 3rd Division Oudh, joined 23rd November 1865.
- " W. Sinclair, Assistant Revenue Surveyor, 3rd Class.
- " E. J. Jackson, *senior*, Sub-Assistant Revenue Surveyor, transferred to Presidency Office, from the 7th May 1865.
- " W. A. Wilson, Sub-Assistant Revenue Surveyor, 2nd Class.
- Serjeant H. Wray, ditto ditto 2nd Class.
- 3) Native Surveyors.

12. The party left Recess Quarters at Barrackpore in the middle of November 1865 for district Manbhoom, where survey operations were resumed on the 1st December.

FIELD OF SURVEY.

* Borabloom.
Bazhmoundce.
Koelapal.
Besla.
Torung.
Matha.
Patkoom } portions of.
Cossyepara }

and $85^{\circ} 52'$ and $86^{\circ} 43'$ East Longitude.

13. The tract which came under survey, consisting of the Pergunnahs* noted in the margin, is bounded on the North and East by the surveyed portions of district Manbhoom; on the West by district Chota-Nagpore; South by districts Singhbloom and Midnapore; and lies between the parallels of $23^{\circ} 19'$ and $22^{\circ} 41'$ North Latitude,

14. It contains 1,034 square miles and 941 villages; only two Pergunnahs, viz., Koelapal and Matha were surveyed in detail (or Mouzahwar) the remainder topographically, without village boundaries. The entire survey was, however, on the uniform scale of 4 inches = 1 mile, the topographical portion being divided into 261 Traverse Circuits, thus affording numerous closing points for the Plane Table.

AREA, NATURE, AND SCALE OF SURVEY. *

15. Check lines were run by European Assistants through the main Circuits to test the accuracy of the interior survey, and the result of comparison was most satisfactory. In the hilly and rugged tracts, where the view was obstructed on all sides by high and rank jungle, the features of the country could only be roughly delineated. The mode of sketching in the hills is thus described by the Surveyor. "When on the summit of the hill, the view is shut out on all sides by jungle,

CHECK SURVEY.

MODE OF SURVEY IN HILLY TRACTS.

which grows high above the head of the observer; and when this is cleared, surrounding hills are certainly visible, but scarcely anything can be seen of the hill on which the observer is standing. The plan adopted in sketching them in was, to lay down from every possible point of view the principal peaks by intersection, and to sketch in roughly the base of the hill, noting the different streamlets that run down the sides, which thus gave an approximate idea of the shape of the hill. All that our maps pretend to, is to show accurately the position of the hills, without attempting any thing beyond this, except a rough sketch of the principal features."

CONNECTION WITH G. T. SURVEY.

* Dalma.
Bandari.
Gurgaburra.

16. Three principal stations* of the South Parishath Meridional Series were connected with the Revenue Survey Circuits, and the following table shows the direct distances between the points compared with the Great Trigonometrical Survey distances:—

From	To	By Great Trigonometrical Survey in feet.	By Revenue Survey in feet.	Difference.	Error of Revenue Survey.
Dalma ...	Gurgaburra ...	96,398.2	96,573.84	175.64	+9.6
Dalma ...	Bandari ...	1,04,648.1	1,04,834.40	186.30	+9.4
Bandari ...	Gurgaburra ...	1,72,084.0	1,71,945.84	138.16	-4.2

17. In addition to the above, two inaccessible peaks, fixed by the Great Trigonometrical Survey, were connected by triangulation, as well as eight* minor stations of the Chota-Nagpore Topographical Survey, thus forming a good junction between districts, Manbhoom and Chota-Nagpore.

* Lakisoni.
Coehla.
Sapra.
Dhobo. | Kuliapur.
Manani.
Kusi.
Borunda.

18. The Surveyor also attempted to throw a network of minor triangles over his work, but sickness in the party, and the scarcity of labour for ray clearing, put a stop to it.

MINOR TRIANGULATION.

19. From the nature of the country and the extreme unhealthiness of the tracts taken up, the survey was prosecuted under great difficulties. All the European Assistants, as well as the Native Surveyors and Measurers, suffered severely from fever. The Surveyor reports the death of twelve Measurers. Another source of embarrassment was the opposition offered by the Ghutwal Sirdars, rendering it necessary to withdraw, temporarily, the survey parties working in a portion of Borabhoom where supplies could not be had.

20. The most serious difficulty was the imperfect state of the demarcation and the worthless state of the Thakbust maps, which were for the most part eye sketches. The Demarcating Officer admits that he authorized his Ameens where the boundaries passed along and over the crests of certain rugged and hilly portions, to demarcate at the foot. In some places the boundary ran along the ridge of a hill for a short distance, and then ended abruptly on coming to the wooded parts, and was not traceable again for 40 or 50 chains, or about half a mile. The Officiating Deputy Surveyor General and Superintendent of Revenue Surveys proposed that in such cases a straight line drawn from point to point should be held to be the boundary; and, in disputed or double boundaries the Demarcating Officer should depute an Ameen to point out the true boundary. The Board approved generally of this course for determining boundaries, but objected to straight lines being adopted, except in the absence of well known boundaries.

21. In the hilly tracts, which have been surveyed topographically, only the exterior boundaries of Pergunnahs have been demarcated.

22. The Surveyor reports that for purposes of check on the professional survey, the 1st and 2nd Class *Thakbusts are useless. In Pergunnahs Koelapal and Matha, which are surveyed

• 1st Class—Plotted, without Bearings being taken.
 2nd „ Done to scale with Bearings, but not under supervision of Demarcating Officer.
 3rd „ Those done under supervision of Demarcating Officer.

Mouzahwar, the Thakbust maps (of the 2nd Class,) bear merely a general resemblance to the Revenue Survey maps.

23. The Boundary between Manbhoom and Singbhoom, and between Manbhoom and Midnapore (3rd class Thakbust,) agrees fairly with the Revenue Survey, but even here 20 miles of the boundary between the two first districts will have to be taken up for the third time, in the ensuing field season. Until means are adopted for testing the accuracy of the Thakbust Maps, the professional survey cannot be declared complete. Particulars of the tract of country surveyed will be found in the Appendix.

24. The maps and records of this survey have been lodged in this Office, and the Main Circuit maps are excellent specimens.

25. The Office was twice inspected by me during the recess, and many of the original board, or field maps, were examined with those being prepared for Office record. Captain Macdonald works his establishment systematically and well.

26. The Surveyor reports very favorably of the qualifications and good conduct of his Assistants, and makes special mention of Messrs. Blyth and Sinclair.

27. Though five Main Circuits were surveyed, only four were completed in detail. About 80 square miles of interior survey still remain to be done in one. The portion of Patkoom lying west of the Soobunrekha river, could not be surveyed, owing to the sickness which prevailed in the survey party, but arrangements have been made for the survey of these two

SICKNESS AND THE DIFFICULTIES EXPERIENCED.

DEMARCATIONS.

BOUNDARY BETWEEN MANBHOOM SINGBHOOM.

MAPS AND RECORDS.

INSPECTION.

ASSISTANTS.

PORTION OF MANBHOOM REMAINING FOR SURVEY.

unfinished circuits, a small party under Mr. Sinclair has been detached for this duty. This is all that remains to complete the district of Manbhoom.

28. The main body of the Survey under Captain Macdonald is now *en route* to Assam, to take up the survey of the district of Luckimpore. It will commence operation on the two large villages of Khowang and Jyepore, which are estimated by the Settlement Officer to contain an area of 493 square miles, and sub-divided in to 50* grants as per margin, of which

* Area of	Square miles	in	Grants.
Khowang	160	17	Grants.
Jyepore	333	33	Grants.
Total	493	50	

all but ten in Jyepore are reported to have been demarcated.

29. These two villages have been recently transferred from the Secbsaugor district to that of Luckimpore, and are situated on the south bank of the Boorec Dehing river.

30. Before the survey of this tract has been completed, it is hoped that the demarcation will have been sufficiently advanced, to admit of ample employment of the establishment during the present field season.

3 R D D I V I S I O N .

LOWER PROVINCES.

31. The Survey party left Dacca, Recess Quarters, between 15th November and 1st

FIELD OPERATIONS COMMENCED.
 N. T. Davoy, Esq., Revenue Surveyor.
Assistants.
 Mr. G. S. Sviney, Assistant Revenue Surveyor, 1st Class.
 " R. Barclay, Assistant Revenue Surveyor, 3rd Class.
 " S. M. Snylie, Sub-Assistant Revenue Surveyor, 2nd Class.
 " T. D. Moran, Ditto 3rd Class, transferred to 5th
 Division, Lower Provinces, on the 16th December 1865.
 " J. H. O'Donol, Sub-Assistant Revenue Surveyor, 3rd Class, transferred from 5th
 Division, Lower Provinces, 27th November 1865.
 " D. A. King, Sub-Assistant Revenue Surveyor, 3rd Class.
 " G. C. Bolst, Office Assistant.
 " J. Arratoon, Ditto.
 26 Native Surveyors.

December, and started work in Cachar on the 20th December. Field operations continued till the 5th May, when the periodical rains set in. The party retired from the field with half its number crippled by sickness.

32. The work of the season consisted of the remaining Circuit of Sylhet, mentioned in para. 51 of last Report, and three Main Circuits of district

POSITION OF TRACT.
 Cachar, lying North of the Barak river, and bounded North by the North Cachar hills, West by surveyed Circuit No. 1, East by Manipore, and South by the unsurveyed portions of Cachar.

OUTTURN. 33. The outturn of the season was:—

Sylhet 253 Village Circuits, containing	.. 125 Square miles.
Cachar 122 Village Circuits, (including 67 Grants)	.. 264 "
Total 375 Village Circuits	.. 389 "

This includes a supplementary area of thirteen Grants lying North of, and contiguous to, Main Circuit No. 1 of last season, and which could not be surveyed then, owing to the boundaries not being cleared. There are still thirteen Grants on the North Frontier of Hill Cachar, which the Surveyor was obliged to leave unfinished, owing to undefined boundaries, and the scarcity of labor for line clearing.

34. Demarcations in Cachar were set on foot in 1862-63-64, and a few Grants were demarcated in 1865. By the time the Survey party entered

DEMARICATIONS.
 the district in December 1865, nearly all the land marks had been swept away by the heavy rains, and the lines of boundary overgrown with jungle. As

the Deputy Commissioner had no establishment to re-lay the boundary in time, the Surveyor's only course, short of stopping the survey altogether, was to measure the boundaries pointed out by the Grantees. This he did, and the discrepancies between the Professional Survey and Thakbust were adjusted among the Grantees agreeably to the award of the Deputy Commissioner. Where the discrepancies exist between Grants and Government lands, the survey cannot be accepted until a comparison has been instituted between the Professional Survey and the re-laid boundary.

35. The Surveyor reports that out of 67 Grants in Cachar, only 16 were marked at triple junctions by masonry pillars, cairns, or slabs; and 51 GRANTS UNDEFINED. Grants were without marks of any kind for future identifica-

tion of boundary. The Grantees have been called upon by the Deputy Commissioner to erect these land marks by 1st January, to admit of a re-survey this season. Unless these instructions are attended to, the survey must again be to a certain extent a failure, and entail heavy loss on Government.

36. In addition to the obstruction offered by defective demarcation, the survey has had to contend with the great scarcity and high price of labor, DIFFICULTIES ENCOUNTERED. and the party has suffered severely throughout the season from

sickness. All this must be considered in connection with the comparatively small outturn.

37. The topography of the open cultivated parts has been shewn as minutely as the scale would admit of, but in the densely wooded tracts (as described in the Appendix,) it was found impossible even to attempt

DETAIL SURVEY. delineation of the ground.

38. The boundary between Sylhet and the Cossyah-hills was defined by rough pillars by the Deputy Commissioner, Cachar, and the Superintendent of Survey, and has been approved of by the Bengal Govern-

ment (vide No. 2,428, dated 21st September 1866, from Secretary to Government, to Secretary to Board of Revenue). An attempt was made to survey this boundary, but the want of coolies for jungle clearing, combined with the sickness of the Assistant deputed to survey it, led to its being abandoned. It will be done this season, when the survey of Sylhet will be complete.

39. The boundary between Cachar and Jynteah, for the settlement of which Mr. Davey was associated with the Deputy Commissioner, was completed as far North as the lands had been allotted. From the triple junction of Cachar, Sylhet and Jynteah, the

BOUNDARY BETWEEN CACHAR AND JYNTEAH. boundary was laid nearly due North, and defined by seven masonry pillars. Farther North the country is unallotted hill and jungle land, within which no limits have ever been recognized.

40. The Surveyor says, that "the boundary between Cachar and North Cachar of the Assam Division has never at any time been determined, and "this line of Frontier for about eighty miles, extending from "Jynteah on the West to Munnipore on the East, remains

"to be discovered and fixed."

41. The area remaining for survey in Cachar is AREA REMAINING FOR SURVEY IN CACHAR. estimated at

60 Villages, containing 60 Square miles.
150 Grants ,, 770 ,,

Total .. 830 ,,

To which we may add .. 3,000 ,, as unallotted wastes,

Making ... 4,830 Square miles as the area still to be dealt with in Cachar.

42. The Surveyor proposes in the ensuing season to take up 300 or 400 square miles of Grants, under tea cultivation, South of the Barak river.

43. The Assistants are all highly commended for their zeal under difficulty and sickness.

44. The maps, with the exception of Main Circuit 21 of Sylhet and the Index, have not been received.

4TH DIVISION.

LOWER PROVINCES.

45. The survey this season embraced the Ganges river and bordering Villages, situate in districts Patna, Monghyr, and Bhaugulpore on the left, and Tirhoot, Monghyr and Bhaugulpore on the right bank. The line of survey extending from the town of Patna to that of Bhaugulpore, was 155 miles in

FIELD OF SURVEY.

Lieutenant W. J. Stewart, Staff Corps, Revenue Surveyor.			
<i>Assistants.</i>			
Lieutenant E. W. Samuells, Staff Corps, Assistant Revenue Surveyor.			
Mr. C. David,	Sub-Assistant Revenue Surveyor,	1st Class.	
Baboo Lallaram,	Ditto ditto	2nd Class.	
Mr. H. R. Littlewood,	Ditto ditto	2nd Class.	
„ T. W. Nicholson,	Ditto ditto	2nd Class, resigned, 1st March 1866.	
„ J. N. Stoelko,	Ditto ditto	3rd Class.	
33	Native Surveyors.		

length, the average breadth being eight miles, including all villages on either bank, likely to be affected by changes in the course of the river.

AREA.

46. The Number of villages brought under survey was 1,657, surveyed in 1,156 Traverse Circuits. Area=1,229 square miles.

47. The Professional and Thakbust boundaries agreed very well, as well as with the boundaries found in the old survey volumes supplied by the Collector, except in the case of villages immediately bordering on the river, and which have been considerably altered by its ever changing course.

DEMARICATIONS.

CHECK ON INTERIOR DETAIL.

48. Three hundred and twenty-nine villages were carefully checked in interior detail.

49. An elaborate survey has been made of the city of Patna on the scale of 16 inches = 1 mile, and arrangements have also been made for a large scale survey of the Civil Station, Fort and Suburbs of Monghyr.

SURVEY OF THE CITY OF PATNA, AND OF MONGHYR.

50. The Surveyor reports having furnished the Special Deputy Collector with a detailed statement, exhibiting the difference in area between the former and present survey of all villages affected by changes in the river. The survey has been purely Mouzahwar, without reference to Mehalwarce or Khetbust tenures.

DETAILED AREAS.

51. The tri-junction points of all the upper line of villages have been marked by masonry platforms, which have been made use of as Survey Stations.

MASONRY PLATFORMS.

52. The work of the season was based on six stations of the North Parasnath Meridional series, and the following table exhibits the result of comparison between Great Trigonometrical and Revenue Survey direct distances.

Names of Stations.	Distance in feet by Great Trigonometrical Survey.	Distance in feet by Revenue Survey.	Difference in feet.		Rates of error per mile in feet.
			...	—	
From Phoolwaree to Bara ...	57,968·1	57,879·4	...	88·7	— 8·0
„ Ditto to Mooktarpoor..	60,208·9	60,181·4	...	27·5	— 2·4
„ Bara to Mooktarpoor ...	63,876·5	63,866·2	...	10·3	— 0·8
„ Burheea to Mathiani ...	63,073·3	63,027·4	...	45·9	— 3·8
„ Ditto to Malti ...	59,390·1	59,369·0	...	21·1	— 1·9
„ Malti to Mathiani ...	58,930·4	58,897·7	...	32·7	— 2·9
General average					— 3·3

53. The Revenue Surveyor remarks that the cost of the re-survey (Mouzahwar,) of the Gunduk Dearehs, situated at the north-end of the river, between Chumparun and Goruckpore, comprising upwards of 100 square miles of heavy jungle, river and sand, the demarcations of which were condemned the previous season, employed one party for the greater part of the season, and added considerably to the expense thrown on the last season's work, within which also should be considered the expense of the Revenue Surveyor employed on the restoration of the Damini-koh boundary.

RE-SURVEY OF GUNDUK RIVER DEAREHS. COMMENCEMENT AND CLOSE OF OPERATIONS. 54. Survey operations extended from the 15th October 1865, to 15th May 1866.

55. The Maps have been detained by the Surveyor, to enable him to make any corrections which may become necessary on account of appeals. All the records are promised by the end of December. Those that were inspected by me early in November, were carefully drawn up and neatly executed.

ASSISTANTS. 56. The European Assistants and Native Surveyors are reported to have given satisfaction.

57. The survey during the ensuing season will be pushed into district Bhaugulpore, Purneah and Maldah, where the area of villages demarcated along the river is estimated at 1,000 square miles. This in addition to the survey of the Damini-koh boundary, just re-laid, will furnish ample work for the season.

5 TH OR BENGAL DOOAR DIVISION.

J. H. O'Donel, Esquire, Revenue Surveyor.

Assistants.

- Mr. J. Pickard, Assistant Revenue Surveyor, 1st Class.
 „ B. H. Billon, Sub-Assistant Revenue Surveyor, 1st Class, transferred from 6th Division, Lower Provinces, from 1st March 1866.
 „ H. Walsh, Sub-Assistant Revenue Surveyor 2nd Class, transferred from 2nd Division, Oudh, on the 8th November 1865.
 „ J. H. O'Donel, Junior, Sub-Assistant Revenue Surveyor, 3rd Class, transferred to 3rd Division, Lower Provinces, on the 27th November 1865.
 „ T. D. Moran, Sub-Assistant Revenue Surveyor, 3rd Class, transferred from 3rd Division, Lower Provinces, on the 16th December 1865.
 „ G. H. O'Donel, ditto, ditto.
 26 Native Surveyors.

58. For the season under review the survey operations of this Division have been conducted in the Western Dooars and Chittagong district.

59. In the former or West Dooars, the tract of country surveyed is situated between the parallels of $26^{\circ} 27'$ and $26^{\circ} 56\frac{1}{2}'$ North Latitude, and the Meridians of $85^{\circ} 31'$ and $89^{\circ} 10'$ East Longitude, over the same ground indeed which was partially surveyed topographically the previous season. It covers an area of 754.42 square miles.

60. In the Chittagong district the third remaining block of hills in Thannahs Ramoo and Tek Naaf has been surveyed. The area is 252.04 square miles, and the area in both districts $1,006.46$ square miles.

61. In the West Dooars, the Revenue Surveyor reports that the tract surveyed was divided into three Main Circuits, which were again sub-divided into ninety-nine smaller Circuits, thus affording ample checks as closing points, for the interior or detail Surveyors. He adds that the interior details of cultivation and waste, village sites, roads, streams, &c., have been very minutely laid in the cultivated and partially open tracts, but that the same minuteness, could not be observed in the Terai, where, although all cultivation, village sites, roads, and large streams, &c., have been taken up, all the small streams could not be surveyed, but are

WEST DOOARS.

merely dotted in, these are stated to be covered with over-hanging trees and creepers, and are only a few feet wide. In the Terai the jungle is said to be so dense, that not a foot can be surveyed without clearing jungle, and that in such dense uninhabited tracts, it was not practicable to do more. These jungle tracts too, are notoriously so unhealthy, that the Surveyors as well as Line-cutters, suffered very severely from sickness, and moreover, were afraid to venture into tracts filled with all sorts of wild animals.

62. In the cultivated and open country again, the interior details of every sheet have been purtalled, either by the Revenue Surveyor himself, or

WEST DOOARS.

the European Assistants. He reports the test to have been satisfactory, and states that confidence may be placed in the correctness of the interior details.

63. The survey in Chittagong was broken up into ten Interior Circuits and ninety-four secondary triangles. The whole of this is topographical, the exterior boundaries only having been taken up.

CHITTAGONG DISTRICT.

64. The interior details in the low lands have been surveyed by compass and chain, checked by purtal lines taken by Mr. Pickard himself, the Assistant Surveyor in charge of this portion of survey.

65. The secondary triangles in the Tek Naaf hills have been connected with the Great

From	To	Chains.	Fees.
Olantong	Tungoo by G. T. Survey	1,207.02	79.531.96
Ditto	Ditto by Revenue Survey	1,201.95	79.529.70

Fees 4.36, or $3\frac{1}{4}$ per mile.

Trigonometrical Survey stations, as furnishing a further check on the proceedings of the Revenue Survey. The result is very satisfactory; the difference in

measurement being 4.36 for the whole distance, or $3\frac{1}{2}$ inches only per mile.

66. The establishment detailed for the Western Dooars, took the field on the 23rd November 1865, and returned to Recess Quarters on the 22nd May 1866. The Surveyor reports that by the 15th April, most of the establishment had been struck down with fever.

67. In the Chittagong district field operations were commenced on the 8th January, and terminated on the 18th June 1866. On the completion of the survey in this district, the party was withdrawn, and rejoined the Head Quarters at Rungpore on the 11th September last. Much time was occupied in the transit of this party from Chittagong to Rungpore,

which has necessarily retarded the final completion of the maps and records, but the Revenue Surveyor expects to have all this out of hand during this month, when they will be transmitted to this office.

68. The orders* of Government sanctioning a demarcation survey of the Dooars, reached the Revenue Surveyor during November; an establishment of Peshkars and Ameens was consequently made

* No. 3090, dated 24th October 1865.

DEMARCATON.

up as fast as possible. He reports, that by the 15th December, boundary pillars had been put up, and sufficient work had been provided ahead of the professional survey, to afford work for four boundary parties. These were the preliminary steps observed by the Revenue Surveyor pending the arrival of instruments for measuring boundaries by the Ameens, and preparing the Thakbust Maps.

69. The comparison of Thakbust Maps with the professional survey was satisfactory.

COMPARISON OF THAKBUST.

The Revenue Surveyor states that the few boundaries which differed were revised and corrected, before the close of the field work.

70. For the current season the demarcation of about 200 square miles of country has been prepared for survey and with the view of keeping the demarcation ahead of the professional survey, which ought always to be. The Revenue Surveyor has solicited sanction, through the Commissioner of the Division, for an extra establishment of one Peshkar and five Ameens.

71. A large amount of work has thus been accomplished by the Revenue Surveyor, which is creditable to his able management. Pending the receipt of the maps, however, and their careful examination with the field records, I am not in a position to offer a decided opinion on the value of the work.

72. The Surveyor mentions in terms of praise the assistance he has derived both from the European Assistants and Native Surveyors, associated with him, who have worked well.

**AREA REMAINING FOR SURVEY
IN THE WESTERN DOOARS.**

73. The area remaining for survey in Dooars Balla and Buka of the Western Dooars is estimated by the Surveyor at 1,200 square miles.

74. The position of ten conspicuous objects, chiefly temples and hauts, have been laid down in the Western Dooars, and of fifteen in the Chittagong district.

75. On the subject of the boundary between Bhootan and the Western Dooars, the Surveyor states, that the Northern boundary of Chukla Moraghât, or Chamoorchee Dooar, only touches on Bhootan, and the line is thus defined by the Commissioner in his No. 608, dated 21st April 1866. The new Bhootan boundary will commence at the left bank of the Teesta (River) and will march with the Sikkim and Thibet frontier up to the Juldoka, the left bank of which river it will follow to a point hereafter to be determined, somewhere between Tondoo and Lopcha, from whence it will trend eastwards, following the base of the Hills to the Monas, and that to the east of that river the existing Kamroop boundary will be maintained. No hill tracts to the east of the Juldoka will be annexed, except the land required at Buxa, and Dewangeree, for the Military positions, but are to be held at those places the exact limits of which are not yet fixed.

76. Buxa will fall into the current season's work, early instructions will be obtained from Colonel Agnew, Commissioner of Cooch-Bihar and the Dooars, about the limits of the hills to be included round the cantonments of Buxa. It would be of great advantage if masonry pillars were put up before the survey commenced.

6TH OR HAZAREEBAUGH DIVISION.

77. The operations of this party have been confined to a Mouzahwar survey in Pergunnah

POSITION OF TRACTS SURVEYED.

- Major G. H. Thompson, Staff Corps, Revenue Surveyor.
- Major W. S. Row, Staff Corps, Assistant Revenue Surveyor, resigned on the 31st July 1866.
- Mr. J. Todd, Assistant Revenue Surveyor, 3rd Class.
- W. Vyall, Sub-Assistant Revenue Surveyor, 1st Class.
- H. Hilton, ditto ditto transferred to 5th Division, Lower Provinces, from 1st March 1866.
- P. H. W. Brady, Sub-Assistant Revenue Surveyor, 1st Class.
- L. G. Hill, ditto ditto 2nd Class.
- R. Scott, ditto ditto 3rd Class.
- 27 Native Surveyors.

Palamow of the district of Lohardugga, and embraced an area of 1,079.35 square miles. It adjoins the previously surveyed portion of Palamow to the North and West, is bounded on the North by Pergunnah Kootombah, Jupla and Bilon-

jah of Behar; and on the South and West by that portion of Palamow which still remains for survey.

78. Of this an area of 835.9 square miles, comprising 863 villages, has been completed in detail; the remaining portion 244.4 square miles having been triangulated only.

AREA.

79. The Surveyor reports the tract of country above detailed, as extremely difficult for survey, requiring skilled draftsmen, quite as much as good mechanical Surveyors. He alleges that every precaution was

NATURE OF COUNTRY.

taken to ensure accuracy on all parts of the operations. Should such a result have been achieved, the out-turn may be considered a fair one, and as much as can be expected in a country difficult of access.

MAPS AND RECORDS.

80. The Maps and Season's records have not yet been received, but are expected shortly.

81. The Government of Bengal has ordered the re-survey of Main Circuits 1 to 7, inclusive of district Hazareebaugh, and this will be undertaken when the unsurveyed portion of Pergunnah Palamow now in hand has been completed. The nature and state of the demarcation operations, having formed the subject of a distinct correspondence with the Board, it is unnecessary to dilate on the subject, more especially as the Revenue Surveyor in his capacity of Civil Superintendent of Survey in Chota-Nagpoor, has, he states, at the request of the Commissioner, submitted a Statistical and General Report for submission to the Board of Revenue.

CHANGE OF SUPERINTENDENCE.

* No. 1474T, dated 14th August 1866, from Officiating Junior Secretary, Government of Bengal, to Officiating Superintendent, Revenue Surveys, Lower Provinces.

82. Under the Orders of Government, Bengal, noted in the margin,* Major G. H. Thompson was relieved of the charge of this party which has been entrusted to Captain J. Sconce, who assumed charge on the 2nd November 1866.

83. Major G. H. Thompson, Revenue Surveyor, has obtained leave on Medical Certificate to Europe.

84. Major Row, Assistant Revenue Surveyor, at his own request, was allowed to resign his appointment on the 31st July 1866. Major G. H. Thompson writes in high terms of praise, of this Officer's amiable and conciliatory character. The vacancy caused by Major Row's resignation has been supplied by the transfer of Lieutenant Samuells from the 4th Division, who joined on 10th November 1866.

ASSISTANTS.

85. The Revenue Surveyor writes in terms of praise of his Assistants and Native Surveyors generally, and particularizes the excellent service rendered by Messrs. Todd and Brady.

86. When the Maps have been received, and a careful examination has been made of the original board maps, with the office copies, I shall be able to form a more decided opinion of the value of the season's survey, which the Revenue Surveyor himself reports as having been very carefully checked.

VALUE OF MAPS.

1st OR DARJEELING WASTE LANDS SURVEY.

87. Work was resumed early in November in district Darjeeling. The portion now surveyed completes the district, and is bounded North by the Big Runjeet river which separates it from Sikkim; South by the Darjeeling

POSITION OF TRACT.

E. T. S. Johnson, Esquire, Assistant Revenue Surveyor in charge.
Assistant.

Mr. P. Cowley, Sub-Assistant Revenue Surveyor, 1st Class.
14 Native Surveyors.

Terai; East by the Western Doonars; West by Nepal.

88. The survey of a large block of land which belonged to the late Dewan Cheeloo Lama of Sikkim, comprising an area of 58 square miles, and lying in the North-West corner of the district, was first taken in hand, but the severity of the winter compelled the Surveyor to withdraw his parties for a time. The snow on the Singalula Range was seldom less than 4 feet deep, and even during the second attempt when the weather was milder, the measurements were over snow.

89. The other blocks taken up were of smaller extent, and consisted principally of building locations. On the harassing nature of this desultory work the Surveyor remarks, "These (sites) take a great deal of time, as the survey can only be made when they are applied for. A Surveyor may be sent to survey a location at Kursion and when done, comes back to Darjeeling for work. Perhaps a day after he arrives, he has to go back, or proceed to another place 10 or 15 miles to survey a location, or divide a piece of land applied for since his return from the last survey, and thus it goes on, so that more time is taken up in going backwards and forwards, than in actual surveying." In addition to this the Surveyor was obliged to subdivide land for planters, and the Conservancy Department, the latter having caused portions of forest land to be reserved, which formerly had been made over to applicants, or were available to them. It is stated that this Sub-division of Estates and cutting up of blocks is likely to continue for many years.

90. The interior details of blocks and estates near Kursion the boundaries of which were surveyed in 1861-62 by Major Sherwill, were filled in, after some trouble, as the old survey stations could not be identified. The Surveyor was obliged to get natural boundaries, streams, or roads surveyed, to enable him to fit the interior work into the Skeleton Survey.

91. The total area surveyed comprised 133 square miles, of which 58 square miles consisted of a regular boundary and interior survey, 63 square miles of only interior survey, mentioned in the foregoing para. 12 square miles of blocks surveyed for planters or the forest department.

92. The Topographical Survey of Darjeeling is now completed, with the exception of the Hope Town Settlement, for the survey of which the planters refuse to pay.

TOPOGRAPHICAL SURVEY OF DARJEELING COMPLETED.

93. As the survey parties were relieved from work in the Darjeeling district, they were despatched to survey the hills of the Western Dooars of Bhootan, lately annexed to Bengal. This tract is bounded North by the Rungpo and Teesta rivers, which separate it from Sikkim; South by Chukla Chengmarce (plains of the Western Dooars); West by the Teesta river, between it and district Darjeeling; East by the unsurveyed portion of the Daling Sub-division.

AREA.

94. The area thus enclosed is 258 square miles.

95. A network of minor triangles, resting on the base between Birch Hill and Senchal G. T. Stations* was thrown North-East across the tract, but the Surveyor was unable, owing to unfavorable weather, to extend the series South-East, as the heavy mists

TRIANGULATION.

* Calcutta Meridional Series.

which prevail in those regions obscured the signals. It was only after a shower of rain, or a thunder storm that the flash of the heliotrope was visible for a short time. The experience gained this season will, however, enable the Surveyor to overcome many of the difficulties attending triangulation, by commencing observations earlier in the season.

INTERIOR SURVEY OF 30
SQUARE MILES INCOMPLETE.

96. The interior survey of about 30 square miles, had to be left unfinished, on account of the setting in of the rains, but will be completed this season.

97. The topographical details were surveyed on the scale of two miles to the inch, and the method of survey is thus described by the Surveyor. "The interior or topographical work, has all been done, as in the " Darjeeling district, by the actual measurement of all

SCALE AND METHOD OF
SURVEY.

" streams, roads, &c., by running lines along them; the intervals being filled in by sketching, and intersections. This method is slower, and less ground is got over than in the regular " Topographical Survey, but it has the advantage of giving more correct results, and will be " found advantageous when the country comes to be marked off into blocks, or estates, " the survey is fitted on by means of the Circuit and Sub-division lines already noted."

98. The survey in the Bhootan Dooars was prosecuted under difficulties, arising chiefly from the impossibility of getting provisions, which had to be sent from Darjeeling, and the lack of local information, until the inhabitants acquired confidence and came forward to

WANT OF SUPPLIES AND IN-
FORMATION.

help the survey operations.

CLOSE OF FIELD WORK.

99. Field work closed in Bhootan on the 20th May, and in the Darjeeling district on the 9th June 1866.

100. The work during the ensuing season will consist, in dividing the forest reserves along the banks of the rivers in the Terai, and the cutting up of lands made over by Government to planters. These lands were reserved by Government for timber, but the Conservator has since pronounced them useless for forest reserves, which are now confined to forests along the Balasun, Meechi and Teesta rivers. The whole of the land thus available has already been applied for, and will have to be marked off for applicants.

101. In the Dooars, the small area of 30 square miles before alluded to, will be finished and then the remainder of the country up to the Bhootan boundary brought under survey. If this boundary does not extend beyond the Jhuldoka river, which rises to the east of the Gimpochi or Gipmochi Mountain, the Surveyor calculates on completing the survey of the annexed Dooars by 15th May 1867.

102. It is satisfactory to learn that in compliance with the late order of the Bengal Government, the proprietors of estates are having their boundary pillars erected.

DEMARICATION OF ESTATES.

103. The maps of the season have not yet been received owing to the heavy work
MAPS. entailed in recess.

104. The Surveyor speaks in high terms of praise of his energetic Assistant, Mr. Cowley.
ASSISTANTS. The Native Surveyors are also reported to have worked well under disadvantages of no common character.

DESCRIPTION OF COUNTRY. 105. Some interesting particulars regarding Darjeeling and the Dooars will be found in the Appendix.

2ND OR UPPER ASSAM REVENUE AND TOPOGRAPHICAL SURVEY.

Mr. C. Brownfield, Assistant Revenue Surveyor in charge, re-transferred to 1st Division, Lower Provinces.
,, H. E. Talbot, Assistant Revenue Surveyor in charge, from 1st February 1866.
Mr. J. D. Lynch, Sub-Assistant Revenue Surveyor, 2nd Class, transferred from 1st Division, Lower Provinces, joined 5th April 1866.
14 Native Surveyors.

106. This party, which has been employed in the Sebsaugor District took the field late in December 1865.

107. The tract of country which came under survey adjoins Main Circuit No. 1 of 1864-65.
LOCALITY. Its Southern limit runs along the Ladoegurh until it meets the Khone Kateea Allee, which forms the Eastern boundary.

On the North and North-West it is enclosed by the Doreeka Nuddee and the Katarce Khamargurh.

108. As stated in para. 120 of the Officiating Deputy Surveyor General's last report,
CHANGE OF EXECUTIVE OFFICERS. Mr. H. B. Talbot, Assistant Revenue Surveyor, assumed charge of this Division on the 1st February 1866, and relieved Mr. C. Brownfield, who rejoined his party shortly after.

109. Mr. Sub-Assistant J. D. Lynch has likewise been transferred to this Division from the 1st or Northern Division, Lower Provinces, and has assisted materially in the advancement of the work. The assistant in charge reports very favorably of him.

110. The total area surveyed, excluding the areas of seven grants surveyed in season 1863-64, amounts to 242 square miles, comprised in,

	19 Mouzals.
	8 Grants.
AREA.	8 Portions of Mouzals.
	2 Do. do. Grants.

Total 37 Traverse Circuits.

111. The survey of a second circuit was undertaken early in May last, and the Officer in charge was in hopes of being able to have brought it to a satisfactory close, at the expiration of a couple of months, but heavy falls of rain, general inclemency of weather, and sickness in the establishment precluded the possibility of his doing so. He was only able to complete the survey of three Mouzals within that circuit, and the Civil station of Sebsaugor; the latter on a scale of 16 inches = one mile.

CHECK. 112. The detail survey has been carefully checked, and with a few exceptions, has been found correct.

113. The small outturn is partly attributable to the party being composed almost entirely of Apprentices. These men have now been instructed and the Surveyor in charge expects to submit a better return for the coming season, but the chief drawback to the progress of the survey appears to have been, as already alluded to, in former reports, the difficulty of having the boundaries cleared by grantees and other proprietors of estates.

SMALL AREA SURVEYED.

DIFFICULTIES.

LABOR.

114. Labor also is very scarce and it may yet become necessary to organize a separate body of men for line clearing.

115. The Officer in charge was much inconvenienced for want of proper land marks indicating the boundaries between grants, &c. He states in para. 26 of his annual report 1865-66. "I found great trouble in connecting the grants surveyed in season 1863-64 owing to the dense jungle, which has grown up since they were surveyed, and as there were no marks of any kind to point out where the boundaries run, the Surveyors generally lost two or three days in searching for the stations. In future, I fear I shall have to re-survey them." It is needless my commenting on this state of things. If difficulty is already experienced in identifying territorial limits of estates, so recently surveyed, "because there are no landmarks," what will it be a few years hence? Unless prompt measures are adopted for their erection, and for their preservation after erection, we shall possess maps with paper boundaries, but it will be impossible to identify or re-demarcate on the ground. Such a result would be extremely unsatisfactory to the Government.

116. In a jungle country, where wild animals abound, to erect the ordinary masonry pillars 4, or 4½ feet above ground, is an unnecessary and useless expense. Wild cattle and elephants rub against them, and soon destroy them. In such localities, masonry pillars might be built flush with the ground, or raised only a few inches above it, they being least liable to destruction. And if their position be indicated on the Thakbust prepared by scale and compass, as well as on the professional maps, we shall possess valuable records by which future litigation would be lessened with respect at least to boundary limits of estates.

MAPS AND RECORDS.

117. The maps and records have not been received but are expected shortly.

118. The operations for the current season will be prosecuted North of the former field of survey, and will extend along the Southern bank of the Bramapootra river.

PROGRAMME FOR 1866-67.

3RD OR LOWER ASSAM DIVISION.

ROUTE SURVEY OF THE BHOOTAN DOOARS.

119. As stated in para. 126 of the last Bengal Survey Report, Mr. Nicolson, after handing over the Kamroop Survey records to the Officer in charge of the 1st Division, proceeded to Cooch-Behar and placed his services at the disposal of the Civil and Political Officer, Colonel Bruce.

J. O. Nicolson, Esq., Officiating Surveyor.
5 Native Surveyors.

120. Mr. Nicolson arrived there at the end of August 1865, and commenced operations, adopting the Bhara Bhita Great Trigonometrical Survey Station as his point of departure, from which he carried a traverse right through the Terai to Buxa, making a sketch of the hills around that place and surveying the road up to Sinchee La.

ROUTE SURVEY THROUGH THE
BUXA TERAI.

121. In the middle of October he received orders to make a rough survey of the Eastern Dooars, with the view of ascertaining the course of the principal rivers and marking the points at which they emerge from the hills.

122. Starting from one of the stations of his last traverse at Allipore, he carried a route survey along the road constructed for troops, viz :—

- 1 From Allipore to Dutma.
- 2 „ Dutma to Jogighopa (Goalpara District.)
- 3 „ Jogighopa to Salmara ditto.
- 4 „ Salmara to Bijni.
- 5 „ Bijni to Dutma.
- 6 „ Salmara to Ruha Thana (across the Monas River.)
- 7 „ Ruha Thana to Bijni.

123. The Surveyor then penetrated the uninhabited portions of the Dooars, and traced up the courses of the Monas and Ai rivers. Failing in an attempt to cross the Cherrong Dooars to Bisin Singh, owing to the impossibility of carrying a survey without cutting through dense jungle, he returned to the main road, and retraced his way to Baska Dooars, where he completed the

COURSES OF THE MONAS AND AI RIVERS.

SANKOS RIVER.

survey of the Sankos river, before retiring from the field.

124. The survey has no pretensions to the accuracy of a regular traverse survey, but is to be considered only as a rough reconnoissance.

THE SURVEY MERELY A RECONNOISSANCE.

125. The difficulties which beset the path of the Surveyor, and told so heavily on his slender resources will be found detailed in the Appendix.

126. He has now retired from the service, with broken health, induced by the hardships to which he was exposed in these fever-stricken tracts.

OFFICE OF SUPDT. OF REVENUE
SURVEY, CALCUTTA,
The 11th December 1866.

}

D. C. VANRENEN, *Lieut.-Colonel,*
Offg. Superintendent of Revenue
Surveys, Bengal.

APPENDICES.

Extract from Annual Report of the Operations of the 1st Division, Lower Provinces, Revenue Survey, by R. B. SMART, ESQ.,—Season 1865-66.

6. The chief town of the District is Gowhatty, or, as it is called in the ancient books of the Hindoos, Pragjoitishpoor, Latitude $26^{\circ} 11' 18''$ North, Longitude $91^{\circ} 47' 33''$ East. It is situated on the left bank of the Brahmapootra River. During the splendour of the Assam dynasty, Gowhatty was one of the largest cities in the kingdom. It was the residence of the Viceroy, or Bar Phukan. The entrances into the city were by guarded passes, of which there were five on either bank of the river. In the centre of the river opposite the station stands a little rocky island, called Umanund. According to the Hindoo legends, this island was formed by the god Sib, of the dust with which he had marked his forehead. It presents a very picturesque object, clothed as it is with trees and crowned with a temple.
7. The rivers that deserve notice at present, are the Monass and the Jeeah Bur Nuddee. In the former, during the rainy season, a small quantity of gold dust is washed down with the sands. The Monass, Chawlkhowa and the Jeeah Bur Nuddee may be considered as the great drains of all the minor streams.
8. It was during the reign of Biswa Sing A. D. 1528-1584, that the great Gohain Kamul Alli Bund road was constructed. This road extended from Cooch-Behar to the Eastern limits of Assam. It served to form the Southern boundary of the Bhootan dominions.
9. On the occupation of the country by the British Government, there was a land taxation according to the local Pergunnah Divisions, an arrangement which had long existed previous to the Assamese Rajahs getting possession of Kamroop. The Pergunnahs were managed by Chowdrees whose leases were annually renewed. The Chowdrees were liable to dismissal for misdemeanor; but most of the Pergunnahs were held hereditarily. The Province of Assam, since it has been entirely under the management of British Officers, has been divided into six districts: Gowalpara, Kamroop, Durrung, Nowgong, Sebsaugor and Luckimpoor. These divisions are sub-divided into Mouzahs, placed under the fiscal management of Chowdrees or Mouzadars, each of whom pays in the revenue of his division direct to the Collector or Deputy Commissioner.
10. The state of agriculture is most deplorable. This may be attributable to the scanty population scattered over large tracts of country. The amount of waste lands, that is, lands not cultivated, but fit for cultivation, is considerably more than one-half the extent of the area of the district, and the extent of unimprovable wastes is comparatively very small, even the hills in most cases are capable of producing profitable crops. Lac is by far the principal article of export. It is taken out of the country in its natural state, or what is called stick-lac. Mr. Beecher is the only English merchant in this district who has established a factory for the preparation of shell-lac and lac-dye.

11. The trade with the adjoining Hill Tribes is at present inconsiderable. In former years the trade between Assam and Bhootan was said to amount to two lakhs of Rupees. The exports from Assam were lac, silks, madder and dried fish. The Bhooteahs imported gold-dust, salt, ponies and Chinese silks. The Abors and Miris bring pepper, ginger and wax. The Cossyahs import potatoes, charcoal and honey, which they exchange for cloths, the manufactures of the country.

12. The Assamese are a degenerate and feeble race and inferior to the Bengallees. The people are divided by an infinite number of distinctions, and the priesthood hold the first place in point of dignity: the Sree-Bhagabut is the chief study of the spiritual guides. The Rarhi Brahmins of Bengal obtained the spiritual guidance of the king and principal officers of the Court. The Assamese Brahmins are called Baidiks: they were introduced into the country by Viswo Singho, the Cooch Raja. Previous to the introduction of the Bramins, the Kolitas, were the Goorus or religious guides for the people. Mussulmans, are not numerous; they have so degenerated into Hindoo superstition, that no one will commune with them. The Assamese hold them in the utmost contempt.

Extract from Annual Report of the Operations of the 2nd Division, Lower Provinces, Revenue Survey, by Captain Donald Macdonald, —Season 1865-66.

9. The tract of country surveyed lies between the meridians of 85° 52' and 26° 43' East Longitude, and the parallels of 23° 19' and 22° 41' North Latitude. It forms the South-Western corner of the Manbhoom district.

10. It is bounded on the North by the work of Season 1863-64; on the East by that of Season 1864-65; on the South by the districts of Midnapore and Singbhoom, and, on the West by the river Subhunreeka which separates it from the Chota-Nagpoor district, and the portion of the Patkoom Pergunnah belonging to Manbhoom, but situated on the right bank of the river.

11. Taken as a whole, it is a wild, barren and inhospitable region, sparsely populated by a race of half-starved demi-savages. Tolerably open and cultivated ground is to be found in Pergunnahs Hesla and Torung and the Western part of Baghmoondee and Northern portion of Borobhoom. All the rest of the country is covered with wild hills and dense jungle. In the Eastern part of Baghmoondee and South of Borobhoom, forest timber exists to a considerable extent, roughly, estimated at from 250 to 300 square miles. The principal tree is Sal, but many other kinds are to be found. A considerable export trade is carried on in Railway sleepers which are carted in large quantities to Ranee-gunge.

12. Supplies are scarce, procured with difficulty and of the commonest and coarsest description. There is a great dearth of water principally in the jungly parts, and when obtained, it is quite unfit to drink, being of a dirty pale beer-color and full of decomposed vegetable matter. I attribute a great deal of the sickness in camp to the want of good water.

13. Each Pergunnah comprised in this tract gives a title to a Rajah who generally resides in the principal village.

14. In addition to these Rajahs, however, there is another class of men, who exercise considerable influence. I refer to the Ghatwal Sirdars, originally I imagine, robber chiefs, and at a later period, in consideration of large grants of land given as subsidy, the nominal protectors of travellers and traders who have occasion to pass through these wilds; these men still retain the title of Sirdar and have a considerable following. The office is hereditary passing to the nearest male relative. They hold the honorary rank of Sub-Inspectors in the new Police, and are reputed to be good detectives. Their head quarters are generally to be found in some out-of-the-way village buried in jungle. Ignorant and illiterate, they seem to be entirely under the influence of acute Bengallees who have been constituted their Dewans or factotums, and who carry on all their public business. As far as my experience went, they seemed but little inclined to do anything but throw obstacles in the way of our operations, and paid little or no attention to the orders that emanated from time to time, either from myself, or even the District authorities including their immediate nominal superior the District Superintendent of Police.

15. The inhabitants were principally Dangurhs, Sonthals and Boomichs. On the borders of Singbhoom Ooriahs are to be found, and all over the country, villages of fat, idle and lazy Brahmins.

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*Extract from Annual Report on the Revenue Survey Operations of the 3rd Division,
Lower Provinces,—for Season 1865-66.*

10. On comparison of the survey with the Thakbust maps, discrepancies were found in boundaries common to Grants, and also in a few cases, in the boundaries between Grants and Villages. These discrepant boundary cases were submitted for adjustment to the Deputy Commissioner (who in Cachar holds the position of Civil Superintendent of Survey) and his decision in these cases recognizes the principle that, so long as the Government interests are unaffected, the line of demarcation between Grants is not material, as the defect in the area of one becomes supplementary to the other, of course, with the consent of both Grantees. In this view, the Thakbust boundary between Grants held under the same rules, is not indispensable, and the surveyed boundaries, confirmed by the Deputy Commissioner, are final, as he is specially empowered* to finally re-adjust boundaries of Grants.

* Section 18, Waste Land Rules.

In the exceptional cases of boundaries of Grants that had encroached on village lands, the survey was disallowed and the Thakbust boundaries are to be maintained. About 10 Grants in consequence require to be re-surveyed, either in whole or in part, to obtain their boundaries according to Thakbust maps.

11. In the cleared and cultivated parts the topographical details have been well filled up to the scale of the survey; but in the impenetrable hills and jungles of Cachar, of course, detail measurements were quite impracticable. The streams are shown so far as they could be traced, and local names of Streams, "Parahs" or hamlets, Beels, &c., have been recorded. Only details that have been obtained by *bonâ fide* measurement are shewn on the maps, and no attempt has been made to sketch the features of ground covered with dense forest jungle, the growth of perhaps a century. Tea cultivation, averaging about 5 per cent. of the area of Grants, was carefully measured by prismatic compass, and its area computed by scale and compass or tale square. On testing some of these areas by traverse re-surveys, they were found correct within 2 to 3 per cent., which is quite close enough for most practical purposes, and certainly sufficient for revenue or settlement investigations, which only aim at finding whether a tenth or fifth of the whole area of the Grant has been cultivated within a certain specified time. To resort to traverse computations to find the area of cultivation, subject as it is to annual increase and decrease, would cost time, labor and money, without any equivalent advantage to Government, and only a temporary one to Grantees.

Extract from Annual Report of the Operations of Darjeeling Revenue and Topographical Survey, by E. T. S. JOHNSON, ESQ.,—Season 1865-66.

26. Since my last Annual Report, Darjeeling has much fallen in the estimation of all classes, as a Tea-growing district; and the recent closing up of Tea gardens, occasioned by the want of money for carrying them on, has of course gone still further to confirm people in the belief that Tea in Darjeeling will not pay. But from personal observations I can say, that Tea cultivation in Darjeeling will pay, and well too. The quality of the Tea is well known, being the best flavored and strongest Tea produced in India, * * * * * and as long as it commands this advantage, it will always get sale. There is no doubt that the owners of Tea estates have made a grand mistake, in purchasing land at the ruinous rates, to have to pay Rupees 40 or 50 an acre, requires a fortune in itself, then the lavish way in which the whole affair has been managed. The enormous establishment of coolies, and paid at very high rates, which might have been avoided, if all concerned in the plantations had consulted each other, on the rate of pay to be given, instead of each plantation trying to do what harm it could to its neighbour, by getting away the coolies by the offer of higher wages. Another great draw upon money, has been from the reckless way in which it has been thrown away in building palaces for the Manager and Assistants to live in. These of course, like all things, are now going to rack and ruin for want of funds to repair them.

If the present owners of plantations will sell them at reasonable rates, it will be a very easy matter, for the next owners to make very good profit out of the Tea now standing, by careful cultivation of the present plants, and this profit might, in three years, be almost doubled by planting the bushes closer. (This is being done in some of the plantations.)*

* See Para. 35 of Annual Report.

27. The cart road is still far from being completed, but it is expected to be opened I believe some time next year, but from Darjeeling to Kursion the carts run every day. This is a great convenience to the Station, as it in a manner does away with some of the trouble and delay caused by the coolies in getting up packages from Punkabaree.

28. The following Paras. are Extracts from Mr. Cowley's Report on Bhootan.

Triangulation. "The portion of work assigned to me was to extend a secondary series of triangles to the newly acquired territory of Bhootan, starting from the principal G. T. Stations of Senehal and Birch hill as a base. "This part of the work was very harassing owing to the mists rising from the river Teesta, "and capping the summit of the hills, or creeping along their sides; generally hiding the "Bhootan hills from Darjeeling."

Aspect of the country. "The aspect of the part of Bhootan under review is the same as Darjeeling, or 'British Sikkim,' to which it is in every way similar, but the country "is more adapted for European settlements. The hills are not "so precipitous and stony as those of Darjeeling; but a gradual incline, about an angle of 20°."

Temperature. "Any variation of climate from 4 to 12,000 feet above Sea level, suitable to different "constitutions, is easily accessible. There is no extreme "variation of temperature, and the fall of rain is considerably "less than Darjeeling."

Soil. "The soil is of a rich black loam, and well adapted for every kind of cultivation."

Water. "Water courses are numerous and very feasible for the erection of mills."

“The route usually taken from Darjeeling is the one from the “Dell,” *via* Lebong the big Runjeet Guard, about ten miles, and from thence a rugged road along the right bank of the Runjeet river to the cane suspension bridge across Teesta river, about twelve miles. After crossing the suspension bridge you have to ascend a very steep hill, to the Stockade of Kaling-Poong about six and half miles. From Kaling-Poong to Paingaon Police Station ten miles, to Labar Stockade eight miles. From Labar have to descend a very steep hill to Ambiokh and the Fort of Daling seven miles.”

Route.
Kaling-Poong (Stockade.)
“This Stockade is about 4,500 feet above Sea level, and the scenery round about is very picturesque, here green and luxuriant wheat fields meet the eye, interspersed with huts surrounded by orange and plantain groves, which are no where to be met with in Darjeeling, and at once exhibit a striking contrast, pleasing in the extreme.”

“The cultivation is generally extended north of the Kaling-Poong ridge. There is none on the hills adjoining the Doors.”

“The Bhoteahs never live below 2,000 feet, or approach the foot of the hills under any consideration. The deadly Terai fever is well known to them.”

Productions Cereals.
“The following are the productions:—wheat, indian corn, rice, and “murwa” (from which the liquor is extracted.) The vegetables are turnips (of a very superior flavor and size), radishes, beans, pumpkins, cucumbers, and yams. The potatoe is not cultivated although so close to Darjeeling.”

Fruit.
“Oranges (the best in India), lemons (growing wild on the hill sides), plantains, peaches and jack—the latter is cultivated in the lower valleys.”

Villages.
“There are no villages of any importance, with the exception of the Fort of Dhumsong, which has been razed to the ground during the late war. The villages (if they can be so called), are scattered huts all over the country, generally surrounded by orange, peach, or plantain trees, usually named after the persons who occupy them.”

“Such is the unsocial character of the Bhootiahs that they never congregate as the villagers in the plains do.”

Domestic Animals.
“The domestic animals are cows, of a very superior breed, nearly equal to the English; pigs, fowls of a very large species, somewhat resembling the game-fowl of Cochin.”

“The Bhooteah cock is distinguished by his peculiar hollow and long crow, which can be heard at the distance of a mile and upwards—sheep, of a white color with brown heads and legs and possessing very superior soft wool, and ponies. I have seen very few of the latter, and of an inferior breed. The best ponies are brought from Sikkim.”

Birds.
“Among the wild birds are, the common wood-cock, pheasants, partridges, quails, green-pigeons, parrots, doves of several species, hornbills, toucans, &c.

Inhabitants.
“The people who inhabit these hills are two classes, Bhoteahs and Lepchas. The former are a stout, sturdy race, of a yellow complexion and of an average stature of 5 feet 10 inches. The Lepchas are not so strong, but more active and nimble than the Bhoteahs. The latter are very quarrelsome and unsocial, as will be seen from their huts being isolated. They are a very revengeful and sly race, (seldom forgiving a wrong done them), the greatest cheats, and

The most bare-faced liars, I may safely say, in all India ! Morality is not named among them, men and women occupy the same apartment, after a day's work they assemble around one fire, with a large basin full of murwa (a spirituous liquor, made from the grain of the same name,) which they suck up through narrow bamboo tubes, and eventually all fall about drunk, from the child to the grand sire, unable to rise till the following morning."

"The women seldom remain true to their husbands. They generally go from one to another, leaving the children, if there are any, with the father ! They generally inhabit the higher, and the Lepchas the lower ranges of the hills. The latter are quite opposite to the former, a most hospitable, cheerful, and obliging race"

"They are very fond of hunting and fishing, and when not engaged in the fields are out hunting deer, which they kill with the aid of dogs, and poisoned arrows, or pit-falls with sharp bamboo stakes fixed inside. Any man or beast falling in one of these would meet with certain death. They are generally made across foot-paths in the jungles, and covered so carefully, that they are not discernible even to a practised hunter. I fell into one of these, but providentially it was an old one, and all the spikes were rotten."

Roads. "The roads are in a primitive state ; natural, rugged foot-paths from hut to hut ; these would be practicable for hill ponies if it was not owing to the numerous trees fallen across them. A ridable road was in construction from the Teesta bridge to the fort of Daling, and I believe is completed by this."

Extent of Information. "As my tour through Bhootan, did not extend more than 15 to 20 miles from the Darjeeling boundary, I am unable to give a detailed report on the country. I hope this season, as we penetrate further and visit ranges from 12 to 15,000 feet above Sea level, to collect more valuable information."

29. "In addition to the above remarks, I might here state, that the Western Doar hills are well adapted for European Settlers, both as regards Country adapted for European Settlers. "tea plantation, fruit gardens and farms. Cattle have very good pasture here, and it is particularly well adapted for breeding sheep. The hills are less fatiguing to travel over, this I know from actual experience, as I had to walk over every bit of the ground visited by me ; and the valleys are much more open than in Darjeeling, and judging from the time I was on those hills, I think they are much healthier than Darjeeling, for the mortality among my coolies and measurers was about three to one, between the two districts. A splendid Sanitarium might be established on the spur running up from the Kaling-Poong stockade towards Labar ; almost any variety of climate may be got, with plenty of water and fine flats or gentle slopes for exercising troops, &c. In fact, an army may be exercised in some places by a little trouble in clearing away jungle. The communication with the plains might be easily made, by a cart road from the Teesta river and then up the Rille river, and so on to the Kaling-Poong spur."

30. "The Fort of Dumsong built by the Bhooteals to protect the valley of that name Dumsong. "from the Sikkim people, was one of the first places occupied by our troops, in the late war, but it is now in ruins. The stone walls are levelled to the ground and the houses of the Llamas, &c., destroyed ; a portion of the North-Eastern gate, however, stands."

"I believe the Darjeeling Sebundee Sappers are to be located somewhere on this spur. The Bhooteah. "The valley below this is very fertile and principally occupied by the Bhooteah race, who seem very well to do, with their rich fields of rice, wheat, &c., lots of cattle and hill ponies, and occupying good substantial and roomy wooden houses ; no where to be seen in our older possessions. * * *

* * * * *

"The poorer classes to be seen about this part, are Lepchas, who have migrated from Sikkim and Darjeeling, and who principally occupy the hills nearest the two countries above named."

“ Very few Lepchas to be met with after we pass the Meridian of Dumsong.”

31. “ Ambiook is the only place in the Western Dooar hills, where a market is held, and where eatables may be had on week days. It is situated in the valley of the Sel or Cheeb river and about 1,000 feet below the fort of Daling.”

It is in direct communication with the plains, a road runs from it to Julpigoree, and carts can be used on it. The supplies for the present Season's operations will be drawn from this place; as Darjeeling will be too far away.

I know nothing of Daling, as it is just out of the Circuit, but my chief camp will be near it this season.

Extract from Annual Report of the Operation of 2nd Division, Upper Assam, Revenue and Topographical Survey, by H. B. TALBOT, Esq.,—Season 1865-66.

14. The trunk road of Assam runs in an Easterly direction and is called the Seonce Allee till its junction with the Mashkhoagurh, then changing its course to the North it runs along the latter named road till it meets the Borallee, and then runs again in an Easterly direction to the junction of the Borallee with the Kuremareegurh; it turns again to the North for a short distance and diverging once more to the East runs into Seesaugor. This road is not finished, but the Public Works Department are going on with the earth work and the bridges as fast as they can; they complain very much of the want of labor. When this road is completed, it will be a fine road, fit for mail carts or wheeled conveyances of any kind.

15. The principal district roads in this Circuit are, the Eastern portion of the Seonce-allee after its junction with the Mashkhoagurh, the Borallee on the East and West of the trunk road and the Dhooduralle. These roads are scarcely passable for three months in the year owing to the innumerable number of breaks caused by small streams and Holas which are not bridged.

16. The only large river is the Dikhoo, this river is navigable throughout the year for certain sized boats, and during the rains steamers come up it as far as Nazra, the Assam Tea Company's station. The next in importance is the Jhanzec which is navigable only for small sized canoes; the next is the Namdang which is scarcely navigable even in the rains. The other streams are all very small and insignificant.

17. The surface of the country is the same as was reported by my predecessor, low land towards the Bhrampootra river and gradually rising towards the South till it reaches the foot of the hills. Almost every village bordering on the Bhrampootra river is submerged during the rains. The village of Jokaeechook which has an area of nearly 30 square miles, is very poorly cultivated owing to the inundation caused by the rise of the river.

18. Supplies are very scarce and can only be had in any quantity in three or four places, such as Jorehaut, Golaghat, Seesaugor and Nazra, but in the district it was with the greatest difficulty that I managed to get barely enough to supply my camp, and I could only get that by giving money in advance. The planters are obliged always to keep a large supply of imported rice on hand. Notwithstanding the large importations of rice, the district scarcely produces enough to satisfy the demand.

19. This year has been anything but a healthy one; there have been seven deaths among the planters and a great many of the Europeans laid up with fever.

Extract from letter No. 23, dated 4th June 1866, from J. O. NICOLSON, Esq., late in charge 3rd Division, Revenue and Topographical Survey, Lower Assam, to Lieutenant-Colonel D. C. VANRENNEN, Officiating Superintendent of Revenue Surveys, Bengal.

2. The Eastern Dooars are very scantily inhabited and unhealthy in the extreme; provisions and carriage are not procurable and the entire face of the country through which my work extended, is thickly covered either with Saul forest or high grass jungle through every inch of which it is necessary to cut or trample paths for men on foot. Even the roads and foot tracks shewn on the map are not all clear of jungle. My lines of Traverse were run over 350 miles of ground, and in addition to my professional duties, I was on various occasions specially employed in furnishing information to the Deputy Commissioner, with whom I was in constant communication, regarding the country and its inhabitants, distances along roads and rough charts of my routes, and traverse lines. For a short time I was further employed in selecting a suitable situation for a Civil station, and having found a hill in the Sidli Dooar which afforded every convenience for a permanent station, I determined its true position and height above sea level by connecting it with two Trigonometrical stations at a considerable distance away to the South. A rough general map was also compiled for the Chief Commissioner, shewing the extent of forest, waste land and clear country or cultivated tracts, to enable the Government to come to a decision regarding the future arrangements for the administration of the country.

3. Except the twelve pack bullocks I was allowed for carriage of provision and which were utterly useless as soon as the main roads was left, I was unprovided with the means of conveying provisions or camp equipage into the interior, but this difficulty was partially overcome by the use of my private elephant; latterly I obtained the use of two more, and without these I probably should not have accomplished as much work as I did.

4. My establishment and myself as was to be expected in such a country, suffered severely from fever, dysentery, &c., and on one occasion, during the month of December, I had not a single man fit for duty for nearly three weeks. It is a mistake to suppose that at any time during my employment in the Dooars I had what could be called a Surveying Establishment; such, it was impossible to raise in the Dooars at any cost, and I considered myself very fortunate in obtaining the number of Khalasis I did.

5. I may also add, that only those who have visited the Eastern Dooars and been actively employed in them, can form any idea of the difficulties of the country. In traversing to lay down villages or track up the course of streams, it generally was my duty to pilot the way and explore the very lines along which it was practicable to clear tracts for chain or perambulator measurements, the country was totally new to myself and establishment, and guides were seldom procurable, much of the interior being unknown to the inhabitants.

Copy of letters No. 127, dated 29th November 1866, from LIEUTENANT COLONEL D. C. VANRENNEN, R. A. Officiating Boundary Commissioner, to the Officiating Superintendent of Revenue Surveys, Bengal.

I have the honor to forward, for incorporation in your Annual Report on the Surveys of Bengal and for submission to His Honor the Lieutenant Governor of Bengal, a Tabular Statement of work performed in my office in connection with my duties as Boundary Commissioner of Bengal for the year 1865-66.

2. The village volumes of the Patna division, in the Surveyor General's Office, have been carefully corrected, the names of the Thannahs to which the various villages belong in each District have been inserted. Changes from one District to another have also been noted in like manner.

3. The final Thannah Lists of the Patna and Sarun Champarun Districts shewing name of each Village, the Pergunnahs to which they belong, their Thukbust numbers, the area of each village, &c., &c., have been printed. The Thannah lists of the former District (Patna) have been distributed to the local Officers, but those of the latter are not yet distributed on account of certain alterations to be made, under subsequent orders of the Bengal Government to some of the Thannah Boundaries of the Chumparun District. A portion of the Thannah lists of the districts of Shahabad and Tirhoot are also printed. The rest are in press.

4. The descriptive statements of the Sub-division and Thannah boundaries of the three Districts of the Bhaugulpore Division, with their re-adjusted Zillah boundaries and the lists shewing the transfer of villages were prepared and submitted by my predecessor in March 1865 for the approval of the Commissioner of the Division and that of the local Officers, but up to date they have not been returned to this office.

5. The Maps of the several districts of the Rajshahee Division were sent to the Commissioner in May 1865 by my predecessor to mark off in consultation with the Police and local Officers, any alterations in the boundaries or sites of Sub-divisions and Thannahs ; but they have not yet been received back.

The descriptive statements of the Sub-division and Thannah boundaries of the districts in the Cuttack Division, their re-adjusted district boundaries together with transfer lists of villages have been prepared and forwarded to the Commissioner on the 12th March 1866 for his approval.

7. The revised Zillah and Sub-divisional boundary descriptive statements of the districts in the Dacca Division have been prepared, and are undergoing final examination. The Thannah arrangements are not yet finally settled. Two maps of the districts of Mymensing and Furreedpore which were sent to the local Officers to mark off the Thannah boundaries, have not yet been received back from the Commissioner. The Thannah boundaries of the District of Sylhet only have been described. The maps of the districts of Dacca and Backergunge were very recently returned by the Commissioner with the Thannah boundaries marked off. The descriptive statements of the boundaries of those two districts are in course of preparation, and will now shortly be ready.

8. I am satisfied with the way in which the Native Assistants have worked throughout the year. More especially Baboo Mohendro Nauth Chatterjee, the head writer, and the draftsman, Moonshee Mehir Allee.

LISTS PREPARED AND FINISHED.

1. Original detailed Statistical Register of 7218 Villages of 20 Thannahs of Zillah Tirhoot, 1548 Villages of 2 Thannahs of Zillah Sarun Chumparun ; 2454 Villages of 3 Thannahs of Zillah Shahabad, 4294 Villages of 11 Thannahs of Zillah Bhaugulpore, 5524 Villages of 12 Thannahs of Zillahs Purneah, and 1464 Villages of 5 Thannahs of Zillah Monghyr, shewing names of Pergunnah, Thakbust numbers, area of each Village and the grand totals of each.

2. Proof sheets of the Statistical Register of 19,694 Villages comprised in 50 Thannahs ; viz., 18 of Sarun Chumparun, 10 of Shahabad, 14 of Patna and 8 of Tirhoot, have been examined, corrected and sent to the Alipore Jail Press for print.

3. Descriptive lists of boundaries of three Districts, eight Sub-division and twenty-two Thannahs of the Cuttack Division.

4. Six detailed lists of transfers of 928 Villages from one Zillah to another; *viz.*, from Cuttack to Balasore, Balasore to Cuttack, Hijellee to Balasore, Midnapore to Balasore, Pooree to Cuttack and Balasore to Hijellee.

5. Two detailed lists of transfers of 671 Villages from one Zillah to another: *viz.*, from Pubna to Furreedpore and Nuddea.

6. Original descriptive lists of Zillah and Sub-division boundaries of the districts of Dacca, Furreedpore, Sylhet, Mymensing and Backergunge and the Thannah boundaries of Zillah Sylhet only.

MAPS PREPARED AND FINISHED.

Scale 1 Mile=1 Inch.

(1.) Five Thannah Maps of the district of Bhaugulpore, 12 Thannah Maps of the district of Purneah containing 7,058 Villages.

(2.) One Map of the district of Monghyr with the Sub-division and Thannah boundaries marked off and colored.

(3.) Two Maps of each of the districts of Noakhally and Tipperah for the Commissioner of the Chittagong Division, under orders of the Government of Bengal, No. 2237, dated 2nd April 1866.

(4.) Three Maps of each of the districts of Cuttack, Balasore and Pooree. Sub-division and Thannah boundaries marked and colored on them and sent to the Commissioner of the Cuttack Division.

(5.) One Map of the Jynteeah Hills for the Commissioner of the Dacca Division.

Scale 32 Miles=1 Inch.

Coloring Commissioner's Division on Eight postal Maps of Bengal and Behar for the Commissioners, for special report on the external boundaries of the British territories under orders of the Government of Bengal, No. 1,242 of 7th April 1866.

(True Extract and Copies.)

D. C. VANRENEN, *Lieut.-Colonel, R. A.,*

Offg. Superintendent of Revenue

Surreys, Bengal.