

GENERAL REPORT

OF THE

Revenue Survey Operations

OF THE

N. W. PROVINCES—ROHILCUND

FOR SEASON

1866-67.

COLONEL J. E. GASTRELL,
DEPUTY SURVEYOR GENERAL AND SUPERINTENDENT OF REVENUE SURVEYS,
UPPER CIRCLE.

CALCUTTA :
OFFICE OF SUPERINTENDENT OF GOVERNMENT PRINTING.
1867.

FROM

THE SUPDT. REVENUE SURVEYS, UPPER CIRCLE,

To

THE SECRETARY TO THE GOVERNMENT,

N. W. PROVINCES.

Calcutta, the 20th December 1867.

SIR,

I have the honor to submit the accompanying Report on the Revenue Survey operations of the Rohilkund Division during the Season 1866-67.

2. The total area completed is 440 square miles, and the total expenditure (including Rs. 331-5-4 drawn as arrears of pay consequent on the re-organization of the Department) Rs. 16,652-8-2, giving a rate of Rs. 37-13-6 per square mile.

3. The following new map has been published during the year :—

Rampoor Jageer, on the Scale of 4 miles=1 inch.

4. From the annexed extract from my Annual Report on the Surveys of Oudh to the Supreme Government, it will be seen that I propose at the end of the present Season 1867-68, and on the completion of the Survey of District Baraitch, to transfer the present 2nd Division of Surveys in Oudh to the North-West Provinces, there to be employed on the Survey of Districts Bijnour and Moradabad successively, thus continuing the order of progression, in the re-survey of the North-West Provinces, approved of by His Honor the Lieutenant Governor.

5. Should this transfer, and consequent increase of the Survey parties in North-West Provinces, accord with the views of Government, then, as the Secretary of the Board of Revenue has reported the demarcation of District Bijnour complete, I solicit, in order to prevent any chance of delay, the issue of orders to the various authorities concerned to have the demarcation marks of at least 1,200 square miles of that District in good and proper order for Survey, and also to furnish the Surveyor, Captain A. D. Vanrenen, with good boundary maps, lists of villages, &c., prior to 1st October next. The tri-junction masonry platforms of villages should also be prepared in advance of professional measurements.

6. *Permanent Boundary Marks.*—The system of permanently marking the triple-junctions of villages may be still further improved upon by having permanent marks erected between them. Wherever stone is available and

plentiful, there I most strongly advocate the system of the Central Provinces being adopted, *viz.*, that of marking every inflection of boundary with a block of stone let into the ground.

7. *Madras System.*—In Madras a most excellent plan prevails, which renders the relaying of a boundary most easy and certain. There at every station where the Theodolite is set up, a masonry platform of definite dimensions is built, or a stone of certain fixed size is imbedded in the ground, so marked as to show at a glance whether the mark defines a triple-junction boundary station, or an intermediate one. From these marks as starting points, and with a simple chain and cross-staff, the exact position of each inflection of boundary can be laid down from the original field-book, absolutely and certainly. The only case in which it would again be necessary to call in the aid of a professional Surveyor and his Theodolite would be in the event of a number of these marks having been wilfully removed. In such cases it would, of course, be requisite to fall back upon the marks nearest to the sites of those removed, and again from the field-book fix from them, by re-observing the angles and re-measuring the distances, the sites of the missing marks. The intermediate points of boundary along each line would then be laid down by chain and cross-staff as before. By these means alone can Government recoup itself completely in the future for the expenses incurred in the present, and give to future ages the full benefit of its Survey operations.

8. *Field-Books.*—Every offset field-book must of course be most carefully kept and guarded. Duplicates should also be made of them. One (the original) to be lodged in the Surveyor General's Office in Calcutta; and the other in the Collectorate Office, or such other place of security as the Government may decide.

I have the honor to be,

SIR,

Your most obedient Servant,

J. E. GASTRELL, *Colonel,*

Supdt. Revenue Surveys, Upper Circle.

GENERAL REPORT

OF THE

Revenue Survey Operations

OF THE

NORTH-WEST PROVINCES—ROHILCUND,

For Season 1866-67.

In pursuance of the plan of operations set forth in paragraphs 11 and 12 of last Report, the re-survey of the North-West

Mr. J. Campbell, Assistant Surveyor, 2nd Grade, in charge.

ASSISTANTS.

Mr. J. H. O'Donel, Sub-Assistant, 3rd Grade, transferred from 3rd Division, Lower Provinces, from 12th March 1867.

Mr. T. S. Martin, Sub-Assistant, 3rd Grade, transferred from 2nd Division, Oudh, from 17th June 1867.

Mr. C. W. Wilson, Sub-Assistant Surveyor, resigned on 1st January 1867.

14 Native Surveyors, &c.

Provinces commenced with Pergunnahs Jehanabad and Pilibheet of District Bareilly. Field-work commenced in October 1866, and closed early in April 1867. Owing to the unhealthiness of the northern portion of the tract under survey, operations were

confined during the early part of the season to the south-west portions of Pergunnah Jehanabad, the line extending eastward into Pergunnah Pilibheet, and gradually into the northern villages of both Pergunnahs.

2. AREA.—The area effected amounts to 438.60 square miles, approximately, comprised in 432 villages, or 460 Traverse Circuits, as shown below:—

No.	Description	Pergunnahs	No. of Traverses.	No. of Villages.	APPROXIMATE AREA IN	
					Acres.	Square Miles.
15.	Jehanabad	...	203	199	117954.67	184.30
16.	Villages surveyed	... } Pilibheet	236	220	128152.60	200.24
16.	Fore-locks	... }	8	27174.81	42.46
16.	Near Cantonment	...	13	13	7424.17	11.60
17.						
18.		TOTAL ...	460	432	280706.25	438.60

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TOTAL OUT-TURN.—To this area is to be added that of two Kumaon Tea Estates,* amounting to 1,004 acres=1.57 square miles, making the total out-turn of the Season 440.17 square miles, approximately. These Tea Estates were surveyed on the large scale of 3 inches=1 mile.

4. The area can only be given approximately for reasons which are fully detailed in following paragraphs 9 and 10.

5. **DETAIL SURVEY.**—The amount of detail to be shown by the interior survey, as sketched in paragraph 13 of last report, was more fully detailed in this Office letter No. 3 of 21st February, to the address of Government, North-Western Provinces, and was approved of

* Vide letter No. 147, dated 8th March 1867. by His Honor the Lieutenant Governor.* This work "was carefully checked not only by frequent inspections of the country by the Surveyor, but by 441 linear miles of Check Survey."

6. **GREAT TRIGONOMETRICAL SURVEY CONNECTION.**—The accuracy of the linear and angular survey measurements was satisfactorily tested and proved by closing on three Tower Stations of the North-East Longitudinal series of the Great Trigonometrical Survey of India. The subjoined comparative Statement gives the values of the sides of the triangle as obtained by Great Trigonometrical Survey and Revenue Survey data :—

GREAT TRIGONOMETRICAL SURVEY STATION.	DISTANCES IN FEET.		Difference.	Error per mile.
	Great Trigonometrical Survey.	Revenue Survey.		
Donao to Kuliaipoor	57766.6	57802.8	36.2	+3.3
Donao to Kaimkhera	58855.8	58853.5	2.3	—0.4
Kuliaipoor to Kaimkhera	46767.8	46745.8	22.0	—2.5
Average where the error is +	3.3
Average where the error is —	1.4

7. **ORIGIN.**—The Donao Great Trigonometrical Station has been adopted as the origin of the Revenue survey in District Bareilly.

8. **OLD N. W. SURVEY TRIANGULATION.**—Sixteen Stations of minor triangulation executed in 1851-52 by Captain Burgess, Revenue Surveyor, along the River Deob which runs between Pergunnahs Jehanabad and Pilibheet, were also identified and taken up.

9. **DEMARCATIION.**—"The boundaries of villages in Pergunnah Jehanabad were well defined," the only delay which occurred being due to the erection of masonry plat-^{irch}forms at triple-junctions after the first professional measurement was completed, "whereby the stations were sometimes lost." The demarcation in Pergunnah Pilibheet, however, years ago to have been very backward, the boundaries of the northern villages not having been defined till March 1867. Owing to the lateness of the season, "it was not without considerable difficulty," says the Surveyor, that "I surveyed them at all, as the high grass jungle which the boundaries led, prevented their being entered upon till just before the season commenced." The Hudbust maps supplied him were unfortunately mere eye and admitted of no comparison with the professional maps. The Surveyor was frequently obliged to return them all for revision, and as up to 3rd December he had not all the Hudbust maps of Pergunnah Pilibheet, he has been obliged to retain the records till he can submit them complete after comparing and passing the boundaries.

10. **FOREST RESERVE.**—The boundaries of villages along the Government Reserve, including the Mala Marsh on the eastern border of Pergunnah Pilibheet, were also but im-

demarcated; and on the Surveyor drawing attention to the discrepancies between the Hudbust maps and the marks on the ground, "the result was, that a large slice of Government Forest which had been dishonestly appropriated by the villagers was cut out and the Forest boundary rectified, except a small portion which (up to 3rd December) was still unsettled and liable to alteration."* The village boundaries between Pergunnah Pilibheet and Pergunnah Bilherree (on the north) are also unadjusted. For these reasons the area of Pergunnah Pilibheet and total area of the season can only be approximately arrived at, and the Surveyor has been obliged to postpone the submission of the maps and final areas.

11. The delays in demarcation, however, appear to have been unavoidable. The demarcation authorities have had, says the Surveyor, "a formidable hinderance to progress to deal with in the climate, and I attribute the delay entirely to the impossibility of effecting demarcations in the northern portion of Pergunnah Pilibheet during the greater part of the year." To avoid these difficulties in future, I would suggest, that in all malarious tracts of country, extra men be appointed during the healthy season of the year to ensure the completion of the demarcation and maps prior to the survey taking the field.

12. SICKNESS.—Sickness arising from the malarious swamps which abound in the tracts under review, crippled the slender resources of this small party early in the season. The health of Sub-Assistant Wilson, and Office Assistant Buttress, suffered so much that the Surveyor was deprived of their aid for nearly the whole of the field season. "My own health," he remarks, "gave way; indeed such was the effect of the malaria upon all, that but few of my men retained their health, and several deaths occurred."

13. BOUNDARY BETWEEN PERGUNNAH PILIBHEET AND POORUNPOOR FOREST GRANTS.—The Surveyor thus mentions the boundary he has laid down between Pergunnah Pilibheet and the Poorunpoor Forest grants which passes through the great Mala Swamp: "I succeeded (but with great difficulty) in effecting what had hitherto been deemed almost impossible, *i. e.*, "to mark out by actual measurement the central deep channel of the swamp, which I have adopted as the Pergunnah boundary instead of taking an imaginary line down the centre. "This will, I hope, prove of use hereafter should the swamp ever be drained."

14. ASSISTANTS.—Messrs. J. H. O'Donel, and T. S. Martin, Sub-Assistants, joined this party late in the season, but were nevertheless of great service to the Assistant in charge, who writes in the highest terms of their good conduct, zeal and efficiency. The Native Surveyors with few exceptions "worked hard and well."

15. NYNEE TAL.—The Estimate for the survey of the settlement (alluded to in paragraph 14 of last Report) having been approved of by the Municipal Committee, "the survey was commenced upon about the end of April 1867 and continued till the rains set in and put a stop to out-door work." It was resumed as soon as the rainy season was over, and the Surveyor hoped to complete the survey before taking the field. The scale is 20 inches = 1 mile.

16. CANTONMENTS.—On completing the survey of the estates, the Surveyor will take up the Cantonment of Nynee Tal on the scale of 8 inches = 1 mile.

17. The general plan of the settlement will be on the scale of 4 inches = 1 mile.

18. PROGRAMME FOR 1867-68.—The work of the present season lies in Pergunnah Newabgunj, directly south of the work under review. The party will also take up the survey of Pilibheet Pergunnah Forest tracts during the healthiest season of the year. For this survey the Board of Revenue has ruled as follows: That "whenever the jungle is excluded from the settlement area of villages, a mere topographical survey is all that is requisite; but where there is a portion of jungle within the recognized boundary of any village, it will be necessary to show the exact amount in the professional plans." This course will be strictly followed by the Surveyor.

* Note - Information of this boundary having been settled reached this office after the Report had been printed. —²

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19. **BAREILLY CANTONMENT.**—A large scale survey (12 inches = 1 mile) will be made of the Cantonments, Town, Civil Station and environs of Bareilly.

20. **MORADABAD CANTONMENT.**—The Surveyor has also been directed to arrange for completing the survey of the Military Cantonments of Moradabad by the addition of the environs to the extent of two miles all round, noting at the same time any changes or additions which may have been made within Cantonment limits since the former Survey in 1864 on the scale of 16 inches = 1 mile.

21. The Superintendent of the Terai Contour Survey should be instructed to supply the Surveyor with all necessary data, to enable him to record the contour levels on the mapping of each season. This is most important. The information is urgently required to give the maps their full value, and should on no account be omitted when available.

J. E. GASTRELL, *Colonel,*
Supdt. Revenue Surveys, Upper Circle.

SUPDT. OF REVENUE SURVEY'S OFFICE; }
Calcutta, 5th December 1867. }

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APPENDIX.

*Extract from Annual Report of the Operations of Rohilkund Revenue Survey, by J. Campbell, Esq.,
Season 1866-67.*

22. GEOGRAPHICAL FEATURES OF PERGUNNAH JEHANAB AD.—The northern portion of Pergunnah Jehanabad is very open and swampy; the country assumes a more wooded appearance to the southward, and the swampy flats or plains gradually disappear; nothing marks the difference between the northern and southern portions of the same Pergunnah so distinctively as the crops, for whilst little else than paddy or rice is grown in the north, there is rich wheat and grain cultivation and very little rice in the southern villages.

23. GEOGRAPHICAL FEATURES OF PERGUNNAH PILIBHEET.—The general features of the country of Pilibheet are very similar to those of Jehanabad, with this exception that rice cultivation extends further south owing to the land contiguous to the forest being well adapted for it. From the appearance of the country between the Forest and the Deoha River, it is evident that great changes have taken place and are still going on, the whole face of the country being intersected and cut up by what cannot be mistaken for other than the partially silted up beds of rivers, only the deeper elbows now remaining: such also form a very peculiar feature in the Forest.

24. DEOHA RIVER.—The chief river in the Division is the "Deoha" which takes its rise in the Kumaon Hills, and follows an almost due southerly course; it forms the boundary between Pergunnahs Jehanabad and Pilibheet, and is a formidable stream during the wet season or monsoons, though every where fordable during the summer months. The high grass jungle along its banks offered serious obstruction to the Survey and necessitated line clearing to an extent equal to, if not greater, than that required in the forest. It is navigable southwards from the town of Pilibheet to its confluence with the Rungunga for boats of about 500 maunds or 18 to 20 tons.

22. MALA SWAMP.—The Mala Swamp is so marked and well known a feature that a few lines respecting it would not be out of place. It forms the eastern boundary of Pergunnah Pilibheet and separates it from the Poorunpoor forest grants. It takes its rise in Pergunnah Bilheree about five miles north of the Pilibheet forest boundary, and continues without a break to Gujrowlee, near the tri-junction of Poorunpoor, Pilibheet, and Beeseelpoor. Its bed is dry within a mile or two of Chorgutea Ghat and is cultivated; below this it is a deadly impenetrable swamp choked with long grass and in some places trees. I succeeded (but with great difficulty) in effecting what had hitherto been deemed almost impossible, *i. e.*, to mark out by actual measurement the central deep channel of the swamp, which I have adopted as the Pergunnah boundary instead of taking an imaginary line down the centre. This will, I hope, prove of use hereafter, should the swamp ever be drained. The swamp is crossed by a wooden bridge at Chorgutea, and again nine miles lower down, at Gujrowla, where it becomes very narrow; a bund with a small opening for the escape of the water is thrown across. From the latter cropping, the swamp almost ceases and becomes an ordinary nala but exceedingly tortuous and sluggish.

26. FOREST.—The Pilibheet Forest is capable of producing fine timber if properly looked after; the present yield of really good timber is very small and the wood taken from it is chiefly for fuel, the town of Pilibheet drawing its supply from it. The trees chiefly met with are Saul and Inderjow with a sprinkling of Jammu Hur, Buheyra, Peepul, Useyna Ujeyn, Goshum, Umultas, Kuchuar, Aoula, Goolur, Pindurca, Assaina, Bhilawa, Kudum,

Morynee and Dhak, a few Huldoo and Semul, and also Pindaroo and Knrounda bushes and a species of wild date.

27. **CROPS.**—The chief crops are sugar-cane, wheat, rice, hemp, grain, pignuts and the various species of pulse and oil seeds common to the North-West Provinces; potatoes, both ordinary and sweet, are likewise grown in some of the villages.

28. Sugar-cane is so extensively cultivated in the southern portions of both pergunnah that it proved a very serious obstacle to Survey Operations; lines could not be cut through it without causing great loss to the cultivators, and there was no alternative but to adopt short lines following the narrow paths dividing the fields and dodging from corner to corner. A person unacquainted with the difficulty would think it strange, on looking at the survey plans, to find the lines so numerous and so short, and I have no hesitation in stating that both circuit and village boundary lines would not have been half the number they were, had there been no sugar-cane.

29. **ELEVATIONS AND LEVELS.**—The northern part of the tract surveyed has an elevation of about 770 feet, and the southern boundary of Pilibheet about 26 miles below is 680 feet above sea level; the fall of country southwards is therefore = $3\frac{1}{2}$ feet per mile. Application was twice made by me to the Superintendent, Terai Contour Survey, for data to enable me to record the relative heights upon my maps, but owing to sickness in his establishment he has hitherto been unable to comply with my request; I hope, however, to obtain the required data before the transmission of the season's records.

30. **TOWN OF PILIBHEET.**—Pilibheet is the chief town of this Sub-Division of the Bareilly District, and has a population of 27,900 souls, inhabiting 6,116 houses. It derives its name from a sect of Bunjarras called "Peerea" and "Bheet," a structure or any thing raised above the ground, the entire name implying the lodgment or "Tanda" of Peerea Bunjarras. They first established themselves at a place now called "old Pilibheet," and removed to the site of the present town about the year 1740 on the invitation of "Hafiz Rhymeet Khan," the then ruler of Bareilly, and in fact of all Rohilkund the town was subsequently fortified, and the old bastions and curtains of it are still standing though delapidated and broken. Pilibheet is the great emporium of Northern Barcilly and the adjacent Terai and Hills, and its Timber and Rice marts are, I believe, unequalled in all Rohilkund. The far-famed Pilibheet Rice is grown in the northern low Terai lands, and the finest and best quality sells at 3 seers per rupee, whilst the price of the courser or inferior description varies from 8 to 11 seers per rupee. Numbers of flat-bottomed boats are annually built at Pilibheet and floated down to Futtehgurh, where they ordinarily sell for about 200 or 250 rupees each. The Joint Magistrate of the District resides at Pilibheet, and there is a Post Office here. It is likewise a chief Police and Revenue Station, the Tuhseel including the whole of Pergunnahs Jehanabad, Pilibheet and Poorunpoor.

31. **VILLAGES OF NOTE.**—The best known and largest villages in Pergunnah Jehanabad are Jehanabad Khas, Umured, Purewa; Police out-posts and District branch Post Offices are at the two former. In Pergunnah Pilibheet the chief villages are Noorea Powta Kulan, Naooklood and Bethoura, the two former having District branch Post Offices and Police out-posts located in them.

32. **MARKETS.**—Weekly markets are held in all the above-named villages.

33. **ROADS.**—The high roads leading from the town of Pilibheet to Bareilly and to Powta are the only ones metalled and bridged throughout. The other roads are little better than straight cuttings, improved with earth-works in low localities, and bridges (chiefly wooden) over the principal streams.

