

108 GENERAL REPORT

OF THE

Revenue Survey Operations

OF THE

PROVINCE OF OUDH

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.

109
No. 4.

FROM

THE SUPDT. OF REVENUE SURVEYS, UPPER CIRCLE,

To

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

Calcutta, 5th December 1867.

SIR,

I have the honor to submit the accompanying Report on the Revenue Survey Operations of the 1st and 2nd Divisions, Oudh, during the season 1866-67.

2. The area and the cost at which it was effected are given in the following Statement:—

Oudh Survey Divisions.	District in which employed.	Village Circuits.	Square Miles.	Total Expenditure.	REMARKS
1st Division ...	Kheree ...	647 (a)	1,239 (a)	61,357	(a). Including an overlap of 42 villages of District Shajehanpore, area=174 square miles.
2nd Division...	Baraitch ...	694 (b)	960 (b)	53,120	(b). Including 35 villages of District Gondah, area=33 square miles, and an overlap of 11 square miles, District Seetapoor. A skeleton circuit of 252 square miles was also prepared in advance for 1867-68, as stated in para. 19 of the Report.
Grand Total for 1866-67 ...		1,341	2,199	1,14,477	Average per square mile Rs. 52, and per village circuit Rs. 85.
Ditto for 1865-66 ...		2,123	2,200	1,15,994	Average per square mile Rs. 63, and per village circuit Rs. 54.
Difference ...		-782	-1	-1,517	

3. Considering that the resources of both Divisions were crippled by sickness, and that the area of the 2nd Division was reduced by causes over which it had no control, as shown in the body of the Report, the out-turn of the season is most satisfactory.

4. The total expenditure for 1866-67 includes also Rs. 6,274-9, drawn as arrears of pay on the introduction of the re-organization scheme on 1st April 1866; if allowance be made for this in comparing the financial results of the two seasons 1865-66 and 1866-67, it will still further improve that of 1866-67. These comparisons, however, are always doubtful and apt to

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mislead. The work of one year, though of less extent than that of the former year, may have given infinitely more trouble, and required far more energy to accomplish, and *vice versa*.

5. The following Maps of Oudh (Carbon transfers) have been published since last Report :—

- Section No. 1*, of Oudh, scale 4 miles=1 inch, including Districts Seetapoor, Hurdin and (portion of) Kheree.
- Section No. 3*, of Oudh, scale 4 miles=1 inch, containing Districts Oonao, Roy Bareilly, and Lucknow.
- Section No. 4*, of Oudh, scale 4 miles=1 inch, containing Districts Pertabgurh, Fyzabad, Barabunkee, and Sooltanpoor.
- Section No. 1*, will eventually embrace the remainder of District Kheree, the survey of which will be completed during the present season 1867-68.
- Section No. 2*, comprising Districts Gonda and Baraitch, has been compiled as far as survey materials have been received in this Office.

Of the 1 mile=1 inch Sectional Maps, 53 in number, each containing 20' of Latitude by 30' of Longitude, the following have been published, *viz.*, Nos. 1, 2, 3, 4, 7, 19, containing portions of Districts Pertabgurh and Oonao.

6. The following were also published during 1867 :—

Lithographed Plan of the Civil Station of Sooltanpoor, scale 8 inches=1 mile.

Lithographed Map of District Roy Bareilly, scale 8 miles=1 inch, for the use of the Distric Officer.

7. The state of the Sectional Maps or Standard Sheets, scale 1 mile=1 inch, is seen at once in the subjoined abstract :—

No. of Sheets containing the Province	...	...	53
No. published	..	...	6 } 33
No. sent to Press for lithography	..	...	27 }
No. remaining	...	...	...
			20

But many of these remaining sheets embrace the yet unsurveyed district of Gonda, and the unsurveyed portions of Districts Baraitch and Kheree.

I have the honor to be,

SIR,

Your most obedient Servant,

 Colonel,

Supdt. of Revenue Survey, U. C.

GENERAL REPORT

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OF THE

Revenue Survey Operations

OF THE

PROVINCE OF OUDH.

For Season 1866-67.

FIRST DIVISION OUDH.

The Establishment left recess quarters on the 13th October 1866, and on 4th November resumed the survey of District Mohumdee, the name of which has since been altered, under Government Notification No. 1074, dated 29th June 1867, to 'Kheree' "from the large town of that name, one of the oldest in Northern Oudh, and situated about three miles due south of the Civil Station of Lukeempoor."

Major F. C. Anderson, Staff Corps, Revenue Surveyor, 2nd Grade.

ASSISTANTS.

Lieutenant A. D. Butter, Staff Corps, Assistant Revenue Surveyor, 1st Grade, transferred to 1st Division, Lower Provinces, from 9th December 1866.

Lieutenant D. C. Andrew, Staff Corps, Assistant Revenue Surveyor, 1st Grade, transferred from 3rd Division, Central Provinces, from 23rd July 1867.

Lieutenant L. T. K. Gustavinski, (Royal Artillery), Assistant Revenue Surveyor on probation, appointed from 4th January 1867 and died on the 6th March 1867.

Mr. C. W. Campbell, Civil Assistant, 3rd Grade.

" G. R. Buttress, Sub-Assistant, 2nd Grade.

" J. A. Swyny, Sub-Assistant, 3rd Grade.

" H. T. Hanby, ditto.

" G. W. Jarbo, Sub-Assistant, 4th Grade, appointed from 1st Novr. 1866.

" J. R. Scott, Sub-Assistant, 4th Grade, appointed from 19th Jany. 1867.

31 Native Surveyors, &c.

2. LIMITS.—The tract of country surveyed extends from the Shajehanpoor District frontier of the North-West Provinces on the west to the Baraitch District on the east, from which it is separated by the River Ghogra or Kowriala. North lie Nepal and the unsurveyed portions of Kheree; South, District Seetapoor and the Kheree Circuits, surveyed in 1865-66.

3. GEOGRAPHICAL POSITION.—It is situated approximately between $27^{\circ} \frac{1}{2}'$ N. Latitude, $81^{\circ} \frac{20}{30}'$ E. Longitude.

4. AREA.—The out-turn of the season, including portions of District Shajehanpoor of the North-Western Provinces, is 1,239 square miles, included in 647 village circuits, and distributed in the following manner:—

No. OF VILLAGES.	PURGUNNAHS.	SQUARE MILES.
36	Alleegunj	88
129	Bhoor	371
19	Khyreegurh	61
210	Kheree	221
62	Sireenugur	100
61	Dhowruhra	70
79	Ferozabad	127
9	Villages of Purgunnah Ferozabad transferred from District Kheree to District Baraitch (subsequent to Survey)	27
42	Villages of District Shajehanpoor	174
647		1,239

5. **SICKNESS.**—Fever was very prevalent among the survey party during the early part of "the cold season, and though the Revenue Surveyor kept his camps as much as possible in the open country, away from the forests, and the least affected by the malarious swamps between the Chowka and the Ghogra Rivers," yet no fever than seven Native Surveyors and 23 Measurers were laid up with fever before the end of November. "In one instance the Native Surveyor alone escaped, and had to come in because there was not one man left in his party fit for work." Not only was work retarded, but, as the Surveyor remarks, "it was effected under great difficulties and depressions." So unhealthy is this part of Oudh bordering on the Terni forests, that the Settlement Establishment, which took the field 15 days earlier than the Professional Survey, "was," says the Surveyor, "so completely disabled by sickness throughout the month of December that for a while the work of this Department was all but suspended in the Kheree District:" considering this, the out-turn above mentioned is quite beyond average.

6. **DEMARICATION.**—The Thakbust Maps are not spoken so well of as usual, and the demarcations were by no means so good as they have generally been. On this point, however, the Surveyor remarks, "the Demarcation Establishment had particular local difficulties to contend against, for this tract of country is very low and partially inundated during the rainy season; the boundary pillars are consequently washed down by the heavy rain, or carried away in the floods from the neighbouring hills; besides which, as already stated, the lowlands of the Kheree District are fever stricken during the earlier months of the cold weather, and the malarious influences of the swamps and pools on all sides render it impossible to maintain the strength and efficiency of any Establishment thrown into the field before the 15th October.

7. **COMPARISON OF DETAIL AREAS.**—The Professional and Settlement Survey proceeded simultaneously in the district, and the Officers in charge of the two Departments so arranged as to bring the same villages under survey within as short an interval as possible, to admit of fair comparison. The detail areas were furnished by the Surveyor to the Settlement Officer as soon as they could be worked out.

8. **DETAIL SURVEY.**—The Professional detail Survey was thoroughly checked by extensive resurveys. As soon as a Native Surveyor had completed his block of villages, numbering from 8 to 15, another Native Surveyor carried a Check Survey, 15 chains broad, through the Section, or when it was impracticable, owing to intervening belts of forest, to run a check line, one village out of the batch was resurveyed. The various main circuits having been thus checked and reported upon, the Revenue Surveyor marked off on the congregated Village Map a line, 20 chains wide, along the entire tract under survey. This final Check Survey was made by the Revenue Surveyor and his Assistants, Military and Civil, and the results compared by the Revenue Surveyor himself with the original surveys. He states that the comparison satisfactorily proved the correctness with which the interior Detail Survey had been executed."

9. **CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.**—Thirteen* Tower Stations of the North-East Longitudinal Series were connected by traverse with the Revenue Survey work. A junction was also effected with the adjoining Districts of Sectapoor and Shajehanpoor. The accuracy of the season's operations is shown by the following Comparative Statement of direct distances

*Sooltanpor.
Ramoopoor.
Ramnaggur.
Kurrai.
Kokra.
Dulchinnaggur.

Sydara.
Kootia.
Asoopoor.
Dhourahra.
Lakoon.
Chelua.
Bela.

the North-East Longitudinal Series were connected by traverse with the Revenue Survey work. A junction was also effected with the adjoining Districts of Sectapoor and Shajehanpoor. The accuracy of the

obtained by Great Trigonometrical and Revenue Survey data and furnished by the Surveyor these results are very good:—

GREAT TRIGONOMETRICAL STATIONS. NORTH-EAST LONGITUDINAL SERIES.	Distances in feet by Great Trigonometrical Survey.	Distances in feet by Revenue Survey.	Difference.	Error per Mile.
Sooltanpoor to Ramooapoor	55916.4	55890.1	26.3	2.5
Ditto to Kurai	55528.1	55496.1	32.0	3.0
Kurai to Ramooapoor	66046.1	66040.3	5.8	0.5
Ditto to Kokra	56752.6	56750.8	1.8	0.2
Kokra to Ramooapoor	61020.2	61005.8	14.4	1.2
Ditto to Ramnuggur	64998.8	64985.6	13.2	1.1
Ramooapoor to Ramnuggur	65734.1	65697.7	36.4	2.9
Duhleinuggur to Ramnuggur	74788.0	74760.8	27.2	1.9
Ditto to Sydara	57188.6	57187.7	0.9	0.1
Ditto to Kokra	74011.2	73988.0	23.2	1.7
Sydara to Kootia	55346.9	55331.8	15.1	1.4
Ditto to Asogapoor	58966.9	58938.7	28.2	2.5
Kootia to Dhourehra	55210.0	55164.1	45.9	4.4
Ditto to Asogapoor	56133.6	56111.9	21.7	2.0
Asogapoor to Dhourehra	62571.1	62537.0	34.1	2.9
Ditto to Lakoon	62102.9	62068.4	34.5	2.9
Lakoon to Dhourehra	67035.0	67015.7	19.3	1.5
Ditto to Chelua	60077.4	60053.4	24.0	2.1
Dhourehra to ditto	56195.2	56152.1	43.1	4.1
Belu to ditto	54069.8	54057.3	12.5	1.2
Ditto to Lakoon	61943.1	61926.5	16.6	1.4
Average error ... ..	.....	.....	.....	2.0

10. BOUNDARY BETWEEN N. W. PROVINCES AND OUDH.—In paras. 3 and 4 of my last Annual Report I remarked on the unsatisfactory state of the boundary between Oudh and North-West Provinces. It has now been decided by the Governments of Oudh and North-West Provinces to finally determine and lay down permanently the boundary between Oudh and Rohilcund. For this duty Mr. H. M. Rogers, Assistant Magistrate and Collector of Bareilly, has been deputed by the North-West Government to co-operate with Mr. John Kavanagh, Superintendent of Demarcation in Oudh. The new boundary is to be carefully and lastingly defined by masonry platforms and pillars; a Professional Survey will then be made of the entire line, and the areas of Villages and Purgunnahs abutting on the reconstructed boundary be finally determined. The areas of Bhoor and Khyreegurh, as given in para. 4, will be accordingly subject to small alterations hereafter, as these Purgunnahs adjoin District Shajehanpoor.

11. PROGRAMME FOR 1867-68.—The area still remaining for survey of District Kheree during present season is estimated at 750 square miles; but as the low lying tracts in Khyreegurh have proved so unhealthy in early winter, the survey party will first enter the Gonda District, where an area of 370 square miles is reported ready demarcated in the Sudder Tehseel. This area, it is conjectured, will be completed by the 1st January 1868, when the Kheree District will be taken up and finished. The out-turn for season 1867-68 thus stands at 1,120 square miles approximately.

12. MEERUT CANTONMENTS.—A small party has already been detached under a Sub-Assistant to survey the cantonments and environs of Meerut on the scale of 12 inches to the mile, to meet the requisition of the Secretary of State.

13. DEATH OF LIEUTENANT GUSTAVINSKI.—Lieutenant Gustavinski was appointed a Probationary Assistant Surveyor on the 7th January 1867; and on the 2nd February undertook the Check Survey through Purgunnah Kheree, accompanied for several days by Major Anderson, who did not leave him until satisfied that the Assistant could work unaided. "Lieutenant Gustavinski was attacked with fever, and on the 24th February went for medical treatment to Lukeempoor, where he died on 6th March. He was zealous, conscientious and full of promise, and his death materially crippled the efficiency of Camp No. 2." and

of the party until the arrival of Lieutenant Andrew Assistant Surveyor who was transferred to this party from the Central Province Surveys.

14. ASSISTANTS.—The Assistant Surveyor and Civil Assistants are all reported to have given complete satisfaction.

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

SECOND DIVISION, OUDH.

16. The operations of this Division were carried on chiefly in District Baraitech, but as part of the adjoining District of Gonda projected into, and was almost surrounded by, villages of Baraitech, it was deemed advisable for professional reasons to include it in the survey; the area, of course, being separately accounted for. The field season extended from October 1866 to May 1867.

Captain A. D. Vanrenen, Staff Corps, Surveyor, 2nd Grade.

ASSISTANTS.

Lieutenant J. E. Sandeman, Staff Corps, Assistant Surveyor, 2nd Grade, transferred to North-West Frontier Survey, from 13th November 1866.

Lieutenant A. F. Cumberlege, Revenue A., appointed Probationary Assistant Surveyor in Home Department Notification No. 119, dated 7th January 1867, joined 15th March 1867.

Mr. W. H. Patterson Civil, Assistant, 3rd Grade.

.. F. W. Kelly, Civil Assistant, 3rd Grade, on deputation to the Head Quarter's Office, Calcutta.

Mr. J. Mill, Mills Sub-Assistant, 3rd Grade.

.. W. Street, ditto, ditto.

.. T. Martin, ditto, ditto, transferred to Rohilound survey from 17th June 1867.

Mr. L. Evans, Sub-Assistant, 4th Grade, on leave on medical certificate for nine months, from 1st January to 30th September 1867.

Mr. T. Patterson, Sub-Assistant, 4th Grade.

39 Native Surveyors, &c.

17. POSITION AND LIMITS.—The portions of country surveyed and completed lay directly east and west of that surveyed and reported upon in 1865-66, and may be roughly described as situated between $\frac{21^{\circ}6'}{2}$ North Latitude and $\frac{81^{\circ}16'}{3}$ East Longitude.

18. AREA.—The area comprises 960 square miles and 694 villages, as detailed belows :—

Purgunnahs.	Teheeds.	No. of Villages.	Area.
			Square Miles.
Fukhurpoor	Baraitech ...	285	423
Ekownah	Hesampoore ...	247	310
Nanpara	Nanpara ...	121	158
Outlying Villages of Baraitech ...	... ..	6	2
Portion of Gonda (para. 29, Report 1865-66) ... ..	... ..	35	33
Overlap in District Seetapoor ...	... ..	.....	11
Area of River Gogra .. ..	... ..	.....	23
	Total ...	694	960

19. FOREST RESERVES.—In addition to this, a skeleton circuit of 252 square miles was prepared in advance for 1867-68, and a boundary survey made of 110 square miles of Forest Reserves. The latter would have been surveyed in detail, but the Demarcation Officer was unable to get the tract ready owing to the limits between the reserves and the contiguous villages not having been determined by the Forest Department. An urgent request has been made to the Financial Commissioner of Oudh to ensure the demarcations of this tract this season, in view to avoiding any further delay and consequent extra expense in surveying the forests of Baraitech.

20. PURGUNNAH DIVISIONS.—Purgunnah Divisions are still undergoing alterations by transfers of villages within District Baraitech, as well as to and from the adjacent districts

of Gonda and Kheree. It is to be hoped that the adjustment of these Sub-Divisional and District boundaries may be speedily carried out and completed, as the issue of final Maps must necessarily be delayed until all is settled. Great trouble and inconvenience result also when alterations of survey records have to be made after being lodged in this Office.

21. **DETAIL SURVEY.**—The Interior Survey has been very carefully tested. The Check Survey was made by the European Assistants, and the direction of the lines so regulated as to test the work of every Native Surveyor. The aggregate length of these check lines amounted to 175 miles.

22. **SICKNESS.**—The Surveyor reports “there was a good deal of sickness amongst the Establishment, a kind of low intermittent fever.”

23. **CONNECTION WITH GREAT TRIGONOMETRICAL SURVEY.**—Six principal stations* of the Great Trigonometrical Survey were connected upon, and the subjoined Statement showing the Great Trigonometrical and Revenue Survey direct distances in feet affords very favorable comparison:—

* *North-East Longitudinal Series.*
Mahsi.
Atkonawa.
Newada.
Israpoor.
Saibarra.
Manichaok.

Great Trigonometrical Stations.	By Great Trigonometrical Survey.	By Revenue Survey.	Error of Revenue Survey.	Error per Mile.
Atkonawa to Mahsi	59124.4	59195.1	+70.7	6.31
Newada to Israpoor	68218.8	68228.1	+9.3	.71
Ditto to Manichaok	60981.8	61037.3	+55.5	4.80
Saibarra to Israpoor	49274.6	49306.9	+32.3	3.46
Manichaok to ditto	65870.5	65856.5	—14.0	1.12
Ditto to Saibarra	59355.7	59540.7	—15.0	1.32
Average where the error is +	...	...	...	3.72
Do. where the error is —	...	...	...	1.22

The Surveyor reports that “nearly all the stations were found in fair order, the masonry pillars or towers being intact.”

24. **BOUNDARY BETWEEN OUDH AND NEPAL.**—It is satisfactory to learn that the pillars defining the boundary between Oudh and Nepal, as laid down by the Boundary Commissioner in 1860 under directions of the Surveyor General of India, are in most perfect order. The Surveyor, writing of the line of boundary which came under survey, states as follows:—“Every pillar we visited was in tact, and found to be as good as if just erected, which, I think, is principally owing to the deep trench round the plinth keeping off the cattle. I have seldom seen a boundary between British and Foreign Territory so well demarcated and in such good preservation, which must be the means of preventing many land disputes and cases of trespass between our villages and those belonging to such a jealous Government as that of Nepal.” It would be well if all district and principal divisional boundaries were everywhere equally well demarcated.

25. **DEMARCATON.**—The demarcation was backward. On taking the field, only Purgannah Fakhurpoor was found completed, and it was not till 1st December that Purgannah Ekownah was pronounced ready for survey. Much time was also lost in consequence of the numerous resurveys which were rendered necessary, when the Professional Maps were compared with those of the Settlement. The fault was owing chiefly says the Surveyor, to the failure of the Zemindars to erect pillars on the sites marked by the

Demarcation Officers. This re-acted on the Professional Survey and reduced the area surveyed considerably.

26. **KHUSREH.**—On the subject of the Khusréh or Settlement Detail Survey, the Surveyor remarks:—"The Settlement Officer did his best to arrange that his measurements should proceed simultaneously with ours, and from time to time we furnished him in the field with the interior details calculated. I am glad to be able to report that I was able this season to compare a number of his Sujrehs (Field Maps) with our board plans. The details agreed fairly, the only difference we discovered was in the item *fit for cultivation*."

27. **ASSISTANTS.**—The Surveyor writes in the highest terms of all his European Assistants, and states also that "the Native Surveyors have as a body worked very well."

28. **RECORDS.**—All the records of the season have been received in this Office and evince neatness and care in every detail. The General Maps executed by Lieutenant Cumberlege and Mr. Thomas Patterson are excellent specimens and well suited for Photography.

29. **PROGRAMME FOR 1867-68.**—The operations of the present season will embrace the remainder of Tehseel Nanpara, containing Purgunnahs Nanpara, Bhingra, Toolseepoor, Churda, and Dhurmanpoor, and complete the survey of District Baraich. The estimated area is 1,040 square miles. This is in excess of the estimate given in para. 32 of last Report, owing to large transfers of villages from Districts Kheree and Gonda to Baraich. In addition to the work thus sketched out, an Assistant's party has been detached for the survey of the environs of Cantonments Lucknow and Fyzabad, scale 8 inches-1 mile, and for the resurvey of Cawnpoor and environs, scale 12 inches-1 mile, to meet the requirements of the Secretary of State for India.

30. **TRANSFER OF PARTY TO N. W. PROVINCES.**—I propose to transfer this Division, on completing the above programme, to the N. W. Provinces, where it will be employed in Districts Bijnore and Moradabad, commencing with the survey of the former, leaving the remaining portion of District Gonda, which will complete the Revenue Survey of Oudh, to be done by the 1st Division Revenue Survey under Major Anderson, who has commenced the survey already.

31. Extracts from the Surveyor's Report descriptive of the country will be found in the appendix.

James L. Batters Colonel,

Depty. Surveyor General.

DEPT. SURVEYOR GENERAL'S OFFICE, }
Calcutta, 5th December 1867.

A large annual fair is held here in the month of February, which is numerously attended from all parts, and at which considerable transactions are effected.

15. **PURGUNNAH GURBAREE.**—Purgunnah Gurboree is the south west Purgunnah of the Berhampooree Tehseel. It is bounded on the North, and north-east by the Purgunnah Berhampore; on the South-east by Purgunnah Rajgurh and on the south by the Purgunnahs Hawelee and Rajgurh.

ITS HILLS.—It is intersected in almost every direction by hills; some in ranges and some isolated, and the whole of the east, south and south west is covered with jungle.

ITS WATERSHEDS.—It is divided into three watersheds in a direction from north to south.

SCENERY.—This is the most picturesque Purgunnah in the Chanda District. Hills covered with green jungle, embosoming broad lakes formed by closing the valleys, are common, while in the lower lands, streams of clear water and luxuriant groves of mangoe-trees afford refreshment and shade to the tired wayfarer.

NUMBER OF LAKES.—This Purgunnah is remarkable for the great number of lakes and tanks which meet the eye in every direction. Some are formed by constructing bunds or dykes across the arms of the valleys between the hills. Those thus constructed are by far the most extensive. The Allewai tank which is the largest in the Purgunnah has an area of 345 acres.

These bunds are in some places of very considerable dimensions, so as to seem more a natural continuation of the spurs of the hills which they unite, than artificially constructed and when the extent of country irrigated in this way is taken into consideration, the sheets of water thus enclosed would, as specimens of long past native skill and industry, bear no mean comparison with some of the best works of our modern Engineers.

CHIEF TOWNS.—The principal towns in the Pergunnah are Gurboree, Sindwai, Tullodce, Nawurgaon, and Goonjwai.

The towns of Gurboree and Sindwai are built around small fortified hills.

16. **PURGUNNAH BERHAMPOOREE.**—Purgunnah Berhampooree is the Western Purgunnah of the Berhampooree Tehseel.

BOUNDARIES.—It is bounded on the north by the Bhundara District and the Wien Gunga; on the east by the Wien Gunga; on the south by the Gurboree Purgunnah; and on the west by the Chimmorr Purgunnah.

It is intersected from west to east by the Botewarree, which flows into the Wien Gunga.

SCENERY.—A great portion of the Purgunnah is open country with rich cultivation. Towards the west and south it is hilly and jungly.

SOIL.—The soil is chiefly red, producing rice crop and sugarcane, with here and there patches of black loam.

The most *striking* natural object is the Peirzagurh range of hills, which run down the east of the Purgunnah from north to south, separating it from Purgunnah Chimmorr.

HILLS.—The southern spur of this range is an abrupt cliff, which stands out as a clearly cut scarp, and may be seen for 40 miles round.

CHIEF TOWNS.—The principal towns in the Purgunnah are Berhampooree and Nagbheer. Berhampooree is the head quarters of the Tehseel and a municipal town.

TANKS.—Numerous fine tanks abound over the Purgunnah, facilitating the culture of rice and sugarcane.

17. The area of tanks, jheels, and nullahs in Purgunnah Berhamporee is 6175.78 acres, and in Gurboree 12735.72 acres, total in both Purgunnahs 18911.50 acres.

In Bhanduk the area of water is only 3718.06 acres, an inconsiderable amount when compared with that of the other two Purgunnahs.

However, in the north of this Purgunnah is one lake which from its romantic situation is deserving of some notice. Taroba, as it is called, lies in the midst of the range of hills already noted as covering the north-east of the Purgunnah.

Elevated a considerable height above the plains below, and a long distance from any village, this solitary lake seems the fitting subject of the many strange wild legends connected with it. Its water is said to be of great depth and is peculiarly clear and transparent.

Its sloping hilly shores are fringed almost to the water's edge with low jungle.

Crowds of pilgrims visit this lake in December and January.

The rites of the spirit of the Luhe are performed by a Gond.

18. * * * At *Berhamporee* there is a Tehseel Court House, Government School, District Post Office, Dispensary, Female School, and Police Station.

At *Bhanduk* there is a School, Police Station, District Post Office and Serai.

At *Gurboree*, a Government School and Police Out-post.

(POLICE OUT-POSTS).—There are in addition *Police Out-posts* at the following towns, viz., Mohurlee, Ellorah, and Ghorpeth, Purgunnah *Bhanduk*, Nagbheer, Purgunnah Berhamporee, and in Goonjwai and Tullodee, Purgunnah Gurboree.

(VILLAGE SCHOOLS).—There are *Village Schools* in Nawurgaon, Tullodee, Sindwai, and Goonjwai, Purgunnah Gurboree, and in Nagbheer, Purgunnah Berhamporee. The latter place also possesses a Girls' School.

DISTRICT POST OFFICES.—There are *District Post Offices* in the village of Mohurlee Purgunnah Bhanduk, and Tullodee, Purgunnah Gurboree.

19. ROADS.—The bridged and metalled road from Chanda to Nagpoor passes through the west of Purgunnah Bhanduk.

20. LINES OF TELEGRAPH.—Along the above-mentioned road a line of Telegraph runs from Nagpoor to Chanda.

An old line of Telegraph runs down the east of Purgunnah Bhanduk to Chanda from Nagpoor.

21. MINERAL PRODUCTS. IRON ORE.—The largest and richest collection of iron ore exhibited at the Nagpoor Exhibition was from the Chanda District.

WHERE OBTAINED.—The ore met with by our party during this season's operations was obtained from a small hill near the village of Lohara, Purgunnah Gurboree and from the Tutolee hill near Goonjwai in the same Purgunnah.

DESCRIPTION.—The specimens of ore obtained seem to consist chiefly of red *Hæmatite*.

MINES.—A few insignificant shafts, or holes in the ground 10 or 12 feet deep, are all that mark the position of these mines on the surface of the earth.

MANUFACTURE.—The process by which the iron is obtained from the ore would seem to be very similar to that generally known as the “*Catalan*” process of the Pyrenees, in which the extraction and purification of the ore are effected in one operation. The ore is smelted in vertical furnaces, and the metal is obtained in a spongy mass *technically* termed “*cutcha*” iron, apparently produced by the combination of the fused slag with the iron.

It is freed from the slag by hammering and beating, when, as “*pucka*” iron, it is forged into slabs, or bars, and sold to the ‘*Iohars*’ or Native blacksmiths, some of whom are to be found in nearly every large village in the surrounding district.

During the above process a considerable portion of the iron must be lost, as a fusible slag collects at the bottom of the furnaces, which is possibly formed by the combination of the silicic acid in the ore with the iron.

This slag is drawn off from time to time through a small orifice at the bottom of the furnace, which when not used as a vent for the clay is kept stopped up with wet clay.

The people connected with this work are called ‘*agris*’ and the trade itself, *Agripun*. These workmen are usually either *Gonds* or *Dheemurs*.

There are two species of furnaces, the *large and small*. Both are constructed of mud. The large one requires the attendance of three men and consumes about 98 seers of charcoal per day, and smelts on an average 105 seers of ore in the same time.

The owner clears about 5 annas a day. The large furnace lasts from 9 to 12 months.

The small furnaces require two men to work them, and yield about eight seers a day of ‘*cutcha*’ iron.

The bellows used in the manufacture is a primitive but effective machine, consisting of long bags, so to speak, of cowhide united at the bottom in a common pipe or nozzle, which is introduced into the furnace near the ground, the air being prevented from escaping by the application of wet clay.

These bellows are worked alternately with each hand, the workman standing to his work; the valve consisting of a slit in the leather at the top of each hide, the edges of which, attached to the forefinger and thumb of each of the operator’s hand, are opened and closed alternately. A constant stream of air is thus kept up into the furnace.

The bellows above mentioned last from six to seven months.

NATURAL HISTORY.—The distinctions between the different part of a district as regards its natural history, trees, and shrubs are at times so slight as to make it difficult to *repeat* a description of them. Such is the case in the portions of country reported on this year and last year.—

TREES.—In *Berhamporee* and *Gurboree* the profusion of mangoe and mohwa or butter trees is marked. All over these *Purgunnahs* mangoe trees abound; while the jungle is in parts composed of scarce any other description of tree but the mohwa.

MANUFACTURE OF SPIRIT.—Up to the 1st of April 1867 the manufacture of spirit from the flowers of the latter tree was extensive. In every village of any size liquor shops existed, where the liquor was made and retailed at prices varying from 2 pice to 1 Rupee for a quart Bottle full according to strength. Since that date the “*Abkaree*” system has been introduced, and the general manufacture of ardent spirits which had previously existed has been prevented and has been limited to the wholesale manufacture to 2 or 3 of the principal towns and the retail to the larger villages.

Great quantities of the Bamboo, (*Bambusa tulda*) along the edges of the Jungle Nullahs and on the hill sides, so thickly interlaced as to be impassable, exist in the forests we have surveyed.

Amongst other trees and shrubs may be noticed the twining '*Cowage*' (*mucuna prurita*) with its pendent legums covered with rigid stinging hairs, and causing an intolerable itching should they happen to touch the person of the passer by.

A few insignificant saplings of teak trees are met with here and there in the jungle.

Gourds and other plants of the cucumber tribe creep fantastically over the roofs of the village huts, while trained over bamboos, so as to form coobarbors in front of the houses. On growing up, poles placed here and there in the small gardens, the twining stems of the native bean, "*Sayme*" (*Dolichoslablab*) impart a somewhat homely appearance to the dwelling places of the poor.

Extract from Annual Report of the operations of 1st Division, Oudh Revenue Survey, by MAJOR F. C. ANDERSON, Season 1866-67.

21. GRANTS.—Thirty-three grants were taken up in Main Circuits Nos. 6 and 7, of which the only one worth mentioning is Mr. Dodd's, known as Allangunj in Main Circuit No. 6. It contains 5430·25 acres of which 503 acres are under cultivation, and 40 acres have been cleared. This grant appears from its position on the high bank of the Chowka to have two advantages over the others in these two Main Circuits: first, timber can be floated down the Chowka almost from Mr. Dodd's house, by which land carriage is saved; and secondly, the people employed on the Estate do not suffer from sickness to the same extent as they are able to get good river water for drinking purposes. The grants along the banks of the Ool are very unhealthy, owing chiefly to the poisonous nature of the water of this nullah, to which is attributable in a great measure the fever so prevalent in the district. The Nazool grants between Luckcha and the River Chowka are mostly covered with high grass, and the wild plum bush so interwoven that walking is impracticable, except along the foot-paths. In the Survey Report of the operations of this party for season 1865-66, it was stated on the subject of grants that the cultivation of Indigo was about to be tried in the bed of the Ool Nuddee. This enterprise proved unsuccessful, as the plant does not thrive, and Seth Luchmeehund, a rich banker who came from Benares, and purchased an extensive tract with the intention of making himself a name by spending his money in reclaiming and cultivating the land, most unhappily fell a victim to the climate, before any of his projects had been matured. The soil of the Nuzool grants along the Sarjoo is very inferior, the trees growing upon it are chiefly Khyr and Sissoo, and there is no probability of any of these grants being taken up.

22. ROADS.—The roads in this district are numerous, and they nearly all start from the column in the Civil Station of Lukeempoor, erected by Mr. Kavanagh, when he was Deputy Commissioner of that district, at a cost of Rs. 3,000, and intended by him as a guide to travellers, but the names of the roads not having been inserted upon it, the pillar does not even serve this simple purpose, and stands a huge mass of useless masonry; it seems almost a pity after so large an outlay, however inadequate the end, that the trifling additional sum requisite to make it serve its original purpose should be now withheld. There is not one single metalled road in the whole district, but the soil being generally hard, it is easy to keep them in good driving order. The road from Lukeempoor to Seetapoor is bridged throughout, and is during the cold weather months in very good condition. From Lukeempoor to Shahjehanpoor the road is good up to the town of Mohumdee, and so far it is bridged, but from this point into Shahjehanpoor it is very uneven and has no bridges whatever. From Lukeempoor to Mittowlee, and from Lukeempoor to Gola and Allangunj, the roads are indifferent, and there is only one Pucca bridge near Mittowlee over the Jumwasa Nuddee. Bridges are in course of construction along these roads, and will, when completed, materially facilitate intercommunication. None of the roads from Lukeempoor to Nighasun, Khyragurh, or to Baraitch have any bridges on them, except the one over the Ool Nuddee, immediately outside the station, and the traces of the first mentioned are frequently lost in cultivation.

23. RIVERS AND STREAMS.—The principal rivers running through the area surveyed during the past season are the Kownals or Ghogra, the Sarda or Chowka, the Sarjoo and the Ool, of which the three first take their rise in the neighbouring hills. Excellent fly-fishing is to be obtained in them all, with the exception of the Ool, which should be rather called a nullah rising from, and fed by, the swamps of the low lands through which it passes. The

River Sarda changes its name at various points of its course. Through the hills where for many miles it forms the boundary between British and Nepalese Territory, it is called the Sarda, and continues to bear this name in the plains until it reaches the vicinity of Roolkan Ghât, where it is met by the small and sluggish stream of the Chowka; from this point it is called the Chowka for upwards of 70 miles, when it is again fed by the Duhour, a small stream that takes its rise in a swamp near Muttera, and from the junction of these two it is called the Duhawur, by which name it continues to be known until it falls into the Ghogra, the largest river in Oudh.

Extract from Annual Report of the operations of 2nd Division, Oudh Revenue Survey District Baraitch, by CAPTAIN A. D. VANRENNEN, Season 1866-67.

DESCRIPTION OF COUNTRY.—The country mapped contains the larger portions of Purgunnahs Fukurpoor, Nanpara, Ekowna, and Bhingā. It is bounded on the north, by the unsurveyed portion of the Nanpara Tehseel of Baraitch; on the east by the Raptee River (the district boundary) and District Gondah; on the south by the Purgunnahs of Baraitch, surveyed in 1865-66; and on the west by the Ghogra River, which forms the boundary between Baraitch and Districts Seetapoor and Kheree (late Lukeempoor). The country lying between the Ghogra and Raptee Rivers is much like other Doabs; being flap and open, and the tracts along the rivers are subject to inundation, which in the rainy season must give a quite different aspect to the country. It is beautifully wooded throughout, and intersected by numerous streams with water in them throughout the year. Purgunnah Fukurpoor is well cultivated, and nearly the whole of it is in the Kupoorhulla Talookha: so is also nearly all Purgunnah Ekowna, the northern portion of which is well cultivated, chiefly with rice. The jungle to the south is mostly composed of young Sal trees, and it gives shelter to numerous wild pigs and neelgae, which commit great ravages on the surrounding fields. The Maharajah of Kupoorhulla is arranging to clear the jungle and to settle down cultivators, and his agents say has made liberal advances to them to attain this object. Numerous traces are visible of this country having once been well populated, and, for the causes stated in my previous Report, *viz.*, from oppression under the former native rule, having relapsed into jungle. That portion of Bhingā taken up is open and well cultivated. Purgunnah Nanpara is mostly covered with jungles and but little cultivated. It belongs to the Talookadar of the same name, who resides at the chief town; he also is holding out inducements to cultivators, to clear the jungle and to settle down in his Talooka. The country being under settlement operations at the time of survey, was seen under its worst aspect.

GRANT.—The only grant is in Purgunnah Nanpara, called now Russia Grant, but better known by its former name Bumhnee Grant. It was purchased in 1865, at a Government auction, by a most enterprising French Gentleman, Monsieur Michea, who commenced clearing the jungle and laid the foundation of a house; but has lately left for Mundla in the Central Provinces, where he thinks his prospects as a grantee would be more favorable than in Oudh. The grant contains 6070·70 acres, of which 5,265 have been sold to the Maharajah of Bulrampoor, the remaining 805·70 acres being still retained by Monsieur Michea. The Maharajah's people have commenced to make clearances, and the sites of many villages had been settled upon before the survey left the field.

RIVERS.—The Ghogra and Raptee are much like other large Indian rivers. The banks of the Raptee are very picturesque, being here and there prettily wooded and covered with green sward; for about 10 months of the year it is navigable for small boats. Owing to the sandy nature of the soil through which it passes, its bed is constantly shifting; a good number of timber rafts are constantly seen on it, on their way to the Lower Provinces. All the Ghats on these rivers are shown on the Maps, and the number of the boats plying at the

time of survey is also recorded. In the winter months the Raptée is fordable in many places. It is famed for the Mahseer Fish found in it.

NUDDEES.—The Sarjoo and Sohtee Nullahs have high and well defined banks, and have water in them throughout the year. In the winter months their beds are dry in places, with deep pools here and there. The stream which flows into the Sarjoo above the village of Rajpore Kulan is that which carries into it the surface water of the Ghogra, when inundating the country, and which so increases its volume that it becomes quite a river. A scheme is in contemplation to avert this, and which would doubtless benefit the country inundated by the Sarjoo.

ROADS.—The road passing through the south-east part of Main Circuit No. 4 is part of the Imperial one from Buhram Ghât: the earth-work is near completion, and materials have been collected everywhere for the bridges. It crosses the Sarjoo Nuddee by a fine wooden bridge erected by the local Committee, and which it is contemplated to replace by a more substantial structure lower down the stream. The district roads leading from Baraitch to Ekowna, Bbinga, and Nanpara, are very fair, embanked and bridged in places. Those leading from Nanpara to Seetapore, *via* the Chularee Ghât, and with its branch to the Kutoree Ghât, are also embanked and bridged in parts. On the branch there is a great deal of traffic during the dry months, principally carts carrying the valuable Sal timber from the Nepal Forests to the Kutoree Ghât, whence it is carried down the Ghogra to the Buhram Ghât, and at the latter place it is distributed by the timber merchants all over the country. I was informed by some of them that they had contracts for supplying it to the Barracks at Gwalior, which shows how scarce good timber has become, and how much in consequence its value must have been enhanced.

Direct lines of roads have likewise been traced from Baraitch to the Chularee and Kutoree Ghâts, and which may perhaps hereafter be made. The Dawk to Seetapore is carried by the Chularee line.

NANPARA.—Nanpara is the chief town, being the residence of the Rajah who owns the larger part of the northern part of the district; traces of the earth-work fortifications dismantled after the mutiny are distinctly visible. The Rajah and his people live in the few pucca houses which are in the town, and he has lately had a fine Bungalow erected in the English style; a new Tehseel and a Police Station combined has been built within the year, also a new school room, to the north of the town.

EKOWNAH KHAS.—Ekownah Khas is a large town and has a fine Bazar. The Police Station is located in a native house. The fort to the west of the town is of some extent, but has been dismantled and the ditch filled up. The Maharajah of Kupoorthullah has appropriated some of the buildings in it as a Tehseelee and residences for some of his Officers.

SISAEAH CHOORAMUN.—At Sisaeah Chooramun a masonry Police Station has been lately erected, which has a fine and imposing appearance; this village has a good Bazar.

BOWNDEE.—Bowndee is a large village, and of some note, as having been the residence of the Rajah of that name, whose territory was confiscated, he having become a rebel. The Head Agent of the Kupoorthullah Estates in Oudh resides here.

About four miles east of Ekownah on the old bank of the Raptée, there are extensive ruins of an old city, now called "Sahet Mahet," which Cunningham supposes to be the site of the celebrated Buddhist city of Sravasti, the decline of which took place in the 4th century. The earth-work ramparts which must have been of great height can distinctly be traced. The space enclosed by them is so strewn with the remnants of bricks and masonry that it cannot be ploughed, and is in consequence overgrown with a dense thorny jungle difficult

to penetrate. For miles around bricks crop out of the ground, and many mounds covered with bricks, probably the sites of temples or public buildings, are met with, in what must have been the suburbs of this fortified city. Several interesting Buddhist statues and inscriptions were excavated and discovered by Cunningham amongst the ruins.

NURUTOMPOOR.—Nurutompoor is a large import mart, where country boats are laden with grain and other local produce, and taken down the Ghogra to the southern districts. There is a large grain depôt here.

BOWNDEE.—At Bowndee and Muhsee are located Police and Revenue collecting stations of the Maharajah of Kupoorthullah.

FAIRS.—Fairs are held at 1st, Junglee Nath's Temple, 2nd, Bunjureah, 3rd, Goolwah Ghât (near where the road from Buhram Ghât crosses the Sarjoo), and 4th, Ram Ghât. The fair at Bunjureah lasts nearly a month.

At the large village of Puchdeoree there is a small preserve of the Khair (a species of mimosa) Jungle, about 70 acres in extent, from which the Kuth (Ang : Catechu) is extracted.