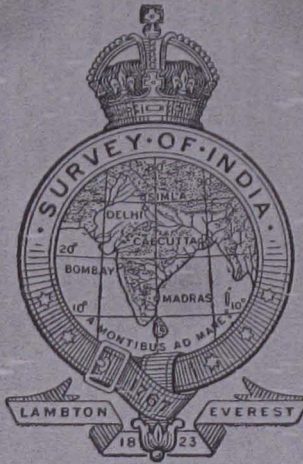


CONFIDENTIAL

SURVEY OF INDIA REPORTS
CONFIDENTIAL SUPPLEMENT

1925 TO 1926



From 1st October 1925
To 30th September 1926.

PUBLISHED BY ORDER OF
Colonel C. P. GUNTER, O.B.E., R.E.,
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CONTENTS.

| | PAGE. |
|---|---------|
| <i>List of provinces and states in each circle</i> | i |
| <i>How we can help you</i> | ii |
| <i>How to obtain maps</i> | iii |
| <i>Abstract of publications</i> | iv |
| <i>List of agents for sale of maps, etc.</i> | v |
| I. INTRODUCTION.— | |
| Annual reports and indexes | 1 |
| Procedure for obtaining confidential maps | 2 |
| II. SURVEYS AND EXPLORATION.— | |
| Surveys for the Turkish Petroleum Company | 3 |
| Geodetic Branch.—Nepāl Survey Detachment | 8 |
| Shaksgam exploration | 8 |
| Frontier Circle.—A. Survey Company | 8 |
| E. Survey Company | 9 |
| No. 18 (Air Survey) Party | 10 |
| Burma Circle.—Unadministered area of "The Triangle" | 10 |
| III. PUBLICATION AND FAIR-DRAWING.— | |
| New publications | 11 |
| Reprints | 12 |
| No. 6 Drawing Office | 14 |
| IV. INDEX MAPS.— | |
| 1. Modern publications, scales 1 inch and $\frac{1}{2}$ inch = 1 mile. | |
| 2. Modern publications, scales $\frac{1}{4}$ $\frac{1}{8}$ inch = 1 mile. | |
| 3. Modern surveys and compilation. | |
| | At end. |

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INTRODUCTION.

1. **Annual Reports** of the Survey of India are now published in three main parts:—

- (a) *Map Publication and Office Work Report*, including indexes showing the progress of publication on all scales.
- (b) *Geodetic Report*.
- (c) *General Report*, containing abstracts of the above two reports, and giving detailed descriptions of field surveys only, with indexes showing the progress of topographical surveys, compilation and publication.

2. **The present Supplement** shows confidential matter, which has to be excluded from the above reports. This mostly relates to surveys and publications beyond the "F. O. U. O." line, which is shown in red on the indexes in this volume. Maps on scales of 1 inch = 8 miles and larger scales, which fall within the "F. O. U. O." area, are classed as "For Official Use Only", and must be reported separately in this confidential supplement.

3. **The Indexes** in this volume are therefore of particular interest, since they alone can show all modern maps and surveys on topographical scales, whether within or beyond the "F. O. U. O." line. Two of these indexes show map publication on various topographical scales while the third shows modern topographical surveys and compilation to date. Maps published prior to 1905 are not shown on these indexes, being drawn in old style and based on the longitude of 1815, which was about 2 miles out of position.

4. "F. O. U. O." maps shown on these indexes, *i.e.*, those beyond the "F. O. U. O." line, can only be issued to officers in Government service on receipt of properly countersigned indents, and to other persons by special permission obtainable through the Surveyor General, or from the Government of India.

The following officers are authorized to countersign indents for "F. O. U. O." maps required by officers in Government service.

1. Secretaries to the Government of India and Local Governments.
 2. Agents to the Governor-General.
 3. Air Officer Commanding, R. A. F.
 4. Military Staff Officers of rank not lower than Staff Officer, 1st grade.
 5. Brigade Commanders and their Brigade Majors.
 6. Commandant, Staff College, Quetta.
 7. Commandant, Senior Officers' School, Belgaum.
 8. Surveyor General (for use of the Survey of India).
 9. Director, Geological Survey of India (for use of the Geological Survey).
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II. SURVEYS AND EXPLORATION.

5. Surveys for the Turkish Petroleum Company, Ltd., Baghdād.—At the request of the Turkish Petroleum Company, Ltd.,

PERSONNEL.

Class II Officer.

Mr. John McCracken, M.B.E., in charge.

Upper Subordinate Service.

Mr. Sajawal Khan.

.. Latif Khan.

.. Iltifat Husain.

Lower Subordinate Service.

Hakhdad Khan.

Muhammād Abdullah.

Mir Abdullah.

Najmul Husain.

Muhammād Mustaffa.

Muhammād Abdul Hamid Khan.

Shaikh Muhammad Fakruddin.

Fazal Husain.

Paniruddin Ahmad.

Baghdād, a survey party, consisting of the marginally noted personnel, sailed from Bombay on the 23rd October 1925 for Basra, and arrived at Baghdād on the 31st October 1925.

The party assembled at Bombay on the 23rd September 1925, with a view to sailing from Bombay on the 25th September, but was detained a month at Bombay awaiting the sanction of the Government of India.

6. *Field work—Triangulation.*—The detail survey was based entirely on triangulation, partly existing triangulation data by the Mesopotamia Expeditionary Force survey party, and partly original triangulation carried out by Mr. McCracken.

The existing triangulation data was found to be insufficient for one inch surveys, the points being often very undefined and far apart. In consequence, the detail survey was often delayed until additional definite and nearer objects were fixed, either by theodolite triangulation by Mr. McCracken, or by plane-table triangulation by surveyors.

Original triangulation was carried out in two different areas:—

- (a) From Fathah on the Tigris river along the Jabal Hamrin range south east towards the Table Mountain on the Diyālah river.

This triangulation emanated from a measured base, observed latitude and azimuth, and an approximate height of a prominent fort in the vicinity of 'Ain Nukhaila Pass on the Jabal Hamrin (*vide* half inch sheet No. 1-38 $\frac{H}{N.E.}$). This triangulation was connected with some 4 to 5 intersected points and stations of the existing triangulation in the vicinity of 'Ain Lailah Pass (*vide* half inch sheet No. 2 $\frac{B}{S.E.}$). The detail survey was carried out on the unadjusted values of this original triangulation.

- (ii) Original triangulation in Jaf country, from a point about latitude 35° and longitude 45° on the Aq Su river to a point about latitude $34^{\circ} 40'$ and longitude $45^{\circ} 30'$ on the Diyālah river.

This triangulation was based on the computed values of two intersected points and one trigonometrical station of the existing triangulation.

The area triangulated is as follows :—

| | |
|--|--|
| Original triangulation | (i) 800 sq. miles for one inch detail surveys. 200 sq. miles for one inch geological surveys. |
| | (ii) 250 sq. miles for one inch detail surveys. |
| Total original triangulation | <u>1,250 sq. miles.</u> |
| Existing triangulation by M. E. F. survey party. | 750 sq. miles. (supplemented for additional intersected points by theodolite and plane-table triangulation). |

The entire original triangulation including reconnaissance, observation and field computations were carried out by Mr. McCracken. The work was most difficult, as the areas triangulated were confined either to a single hill range with desert country all around, or to low-lying hills devoid of conspicuous objects or peaks which might help in their identification. To add to the difficulties, stone cairns, erected over stations and intersected points for purposes of easy identification, were often destroyed by shepherds and others wandering on the hills.

7. *Detail surveys on the scale 1 inch=1 mile.*—All the detail survey was carried out on the scale 1 inch=1 mile. No sketching of adjoining hills or features of any description was permissible or possible, as only the area required by the company's geologists was to be surveyed, and the limits of survey had to be strictly observed.

The detail survey was carried out with the very greatest care by all surveyors, and the accuracy of their work was favourably commented on by the geological staff. The usual practice was to supply traces or prints of the original plane-table sections to the field geologists, who in turn went over the same area and thus had every opportunity of carefully testing the accuracy of the work, whilst surveying and inserting geological data on the maps supplied.

The areas surveyed were most difficult, consisting chiefly of very broken and intricate low gypsum hills, devoid of fresh water, fodder and fuel, and there were but few villages in the vicinity. In consequence, owing to the difficulties in obtaining transport, labour, escorts, rations and drinking water, the general conditions of camp life became very arduous indeed.

The average out-turn per surveyor for 6 months was about 25 sq. miles per month. This apparently low out-turn is actually very good, considering the difficulties of transport and the camping arrangements, (two surveyors having to camp together and share tents, as explained below). Moreover the area surveyed consisted of numerous small detached areas and the most trying weather and abnormal rains were experienced during January, February and March.

The total area surveyed on the scale 1 inch=1 mile was about 1,800 sq. miles; of this area about 750 sq. miles had previously been surveyed on the scale $\frac{1}{2}$ inch=1 mile.

The surveys completed during the season are shown on the index map showing surveys and compilation at the end of the book.

8. Distribution of surveyors.—Under instructions from the Turkish Petroleum Company, Ltd., the party of 12 surveyors was divided into 6 detachments of 2 surveyors each, partly with a view to better mutual protection in the unsettled state of the country, and partly on account of insufficient escorts.

In practice this arrangement was found to be most unsatisfactory.

Each pair of surveyors was obliged to share a single fly tent (size 14' x 8'), as there were no others available, and, though there were no actual quarrels, the general good feeling between surveyors was sometimes strained. It is hardly fair to expect surveyors of different classes to share tents under any circumstances, and they have all expressed a wish that they should not have to do so again.

The work was greatly delayed thereby and time lost in surveying and adjusting numerous small detached areas. It was found extremely difficult to find camping sites suitable to both surveyors, and this resulted in much hardship to the followers, when the work was distant from camp.

All the surveyors (including 3 Upper Subordinate officers) have done their best and deserve great credit for their work under the most trying circumstances.

9. Weather conditions.—The general weather conditions during January, February and March were most trying, the average number of wet days during this period being 18 days per month. Though the work was greatly handicapped by the rains, they were most welcome and a real blessing in disguise, as without them it would have been practically impossible to complete the surveys in most areas without illness, unless special arrangements for providing good drinking water could have been made. Most of the water in the survey areas was brackish and unfit for drinking purposes.

10. *Transport*.—Permanent mule transport—(12 mules per detachment of 2 surveyors)—was provided for all parties. In addition all surveyors were supplied with riding horses.

Temporary mule transport was provided for Mr. McCracken's party for triangulation and inspection and supplemented by motor transport when necessary. The transport arrangements were very satisfactory.

11. *Camp followers*.—In addition to personal servants, five followers were provided for each surveyor. This number was necessary as a reserve, and for actual work, as the nearest villages were often 60 to 80 miles from the areas under survey. Moreover, water and fuel were very scarce and difficult to obtain. Rations too, often had to be fetched from great distances. Most of the followers worked very well.

Free rations were provided to all local followers in addition to pay at Re. 1 per day.

12. *Military and police escorts*.—All parties were provided with escorts of a strength varying from 5 foot police to 40 mounted troops according to the conditions prevailing in different localities.

The escorts on the whole were satisfactory, though, in some of the deserted and disturbed areas, they were a continual source of trouble to the surveyors.

13. *Thefts and robberies*.—Throughout the season, survey parties, both at work and in camp, were continually worried by petty thefts, attacks and sniping. Towards the end of the season, Mr. Sajawal Khan's camp was attacked and robbed of 14 transport animals. Three weeks later surveyors Najmul Husain and Mir Abdullah were attacked while at work and temporarily taken prisoners.

After this bold attack and robbery, work was abandoned in the area as it was considered politically unsafe to carry on without further trouble.

14. *Health*.—The health of the party throughout the season was good. Fazal Husain however fell ill with dysentery and remained for nearly six weeks in hospital, where he was well cared for.

Minor ailments, lasting a day or two, were not uncommon, and were chiefly due to the damp and intense cold during the winter months.

Towards the end of the season—May—all surveyors were inclined to suffer from dysentery and diarrhoea, as a result of drinking brackish water.

Saiyid Ibrahim, personal servant to Muhammad Abdul Hamid Khan, died in hospital at Kirkūk early in January 1926.

15. *Return to India.*—At the close of the survey season. Mr. Iltifat Husain and surveyor Mir Abdullah were transferred to Army Headquarters, Baghdād, from 1st June 1926.

The remainder of the party left Baghdād on the 4th June 1926. sailed from Basra that same day, arrived at Bombay on the 11th June 1926, and were reverted to the department from 1st August 1926.

16. *Disposal of triangulation records.*—All charts, angle books, and computations in connection with the triangulation, were made over to the Turkish Petroleum Company, Ltd., Baghdād, and, it is understood, they will be made over to the Survey of India, when the surveys are completed.

17. *Disposal of plane-table sections.*—All the original plane-table sections were also made over to the Turkish Petroleum Co., Ltd., Baghdād.

Traces are now being prepared by the Director of Surveys, Baghdād, for prints in black and brown.

Traces of all plane-table sections were also prepared by surveyors and black prints produced by the photostat. These black prints were used by the geologists in the field and found most satisfactory.

It is understood that these original plane-table sections will also be made over to the Survey of India, when the fair traces have been prepared and the maps published in black and brown.

18. *Large scale surveys.*—Towards the end of the season—May—the party was called upon to undertake some large scale surveys on the scales 6 and 12 inches=1 mile. This work could not be undertaken, as it was practically impossible to carry on outdoor work under the approaching hot weather conditions. Besides, the surveyors were beginning to feel the bad effects of the brackish water and accordingly there was no alternative but to close work for the season.

19. *Conclusion.*—In conclusion, it may be mentioned that, except as regards tents, the general arrangements by the company for transport, escorts, camp equipment, hospital, medical attendance, light, fuel, etc., left nothing to be desired. All genuine complaints and reports regarding thefts and attacks on survey parties received attention without delay. The manager of the company has written expressing his appreciation of the work which was carried out under the most trying conditions, and of the behaviour and conduct of the party, which is reported to have been exemplary. Mr. Sajawal Khan's local experience and influence proved of great value to the party.

This digitized volume is incomplete!

An original copy of this report can be seen at the
National Archives of India, New Delhi