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*India*  
**SURVEY OF INDIA**  
**MAP PUBLICATION**  
**AND OFFICE WORK**  
**1929 TO 1930**



U. S. GEOLOGICAL SURVEY

JUN - 6 1931

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From 1st April 1929  
To 31st March 1930

PUBLISHED BY ORDER OF  
BRIGADIER R. H. THOMAS  
SURVEYOR GENERAL OF INDIA

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Printed at the Photo.-Litho. Office  
Survey of India  
CALCUTTA  
1930

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Price One Rupee, or One Shilling and Nine Pence.

**SURVEY OF INDIA**  
**MAP PUBLICATION**  
**AND OFFICE WORK**  
**1929 TO 1930**

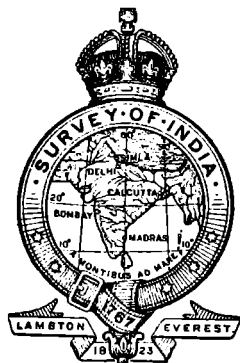


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1930



Surveyor General's Office,

No. 13, Wood Street,

Calcutta, 1<sup>st</sup> ~~May~~ January 1931.

Brigadier P. H. Thomas, D.I.C., R.E., Surveyor General  
of India, has the honour to present to The Director of  
the United States Geological Survey  
Washington D.C.

with 1 copy of the Map Publication and Office Work Report  
of the Survey of India for 1929-30 and requests the favour of an  
acknowledgment of the receipt of the same on the accompanying  
Card.

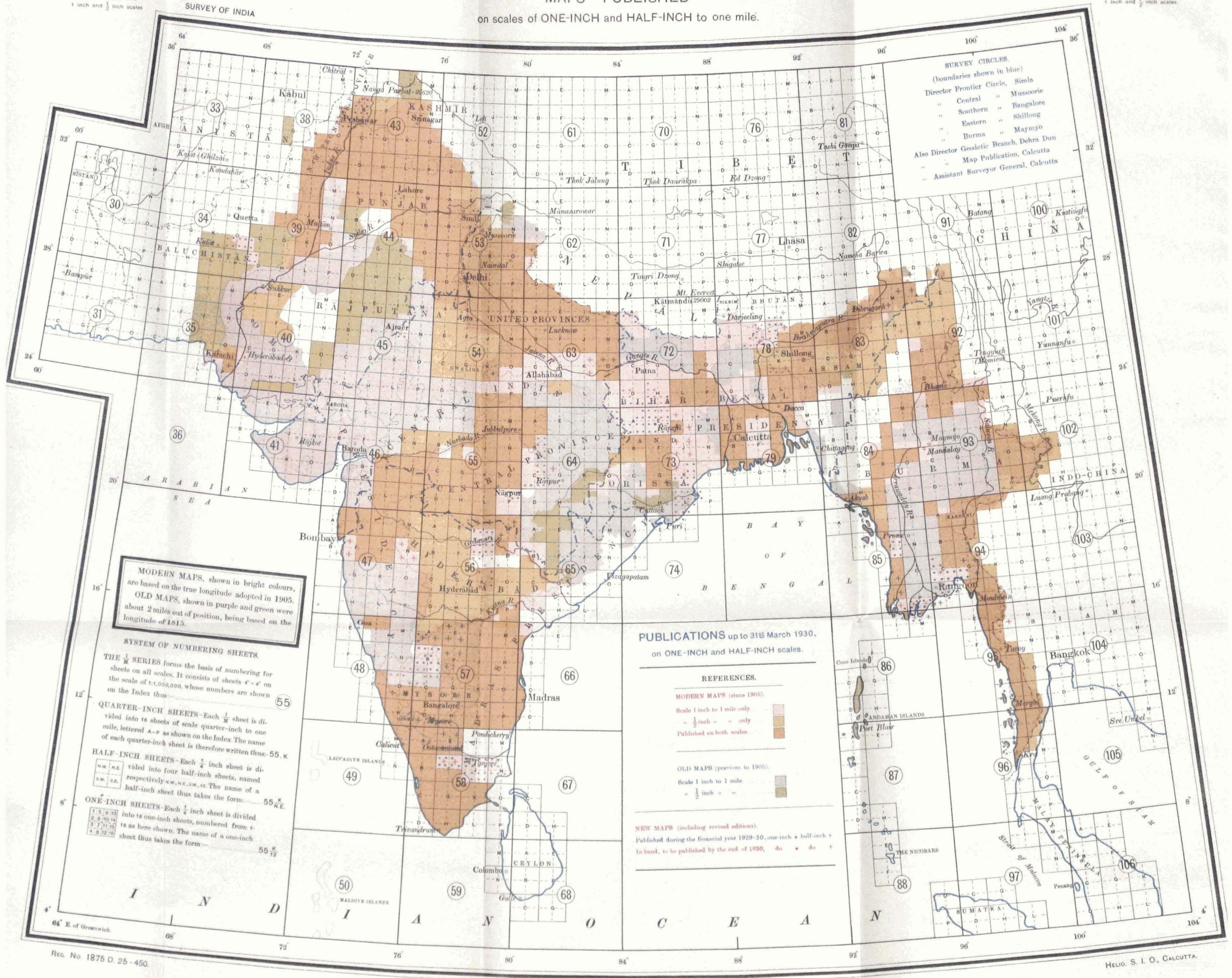
**SURVEY OF INDIA**

**MAP PUBLICATION**  
**AND OFFICE WORK**

1929 to 1930



SURVEY OF INDIA



**SURVEY CIRCLES.**  
(boundaries shown in blue)  
Director Frontier Circles, Simla  
" Central " Mussoorie  
" Southern " Bangalore  
" Eastern " Shillong  
" Burma " Maymyo  
Also Director Geodetic Branch, Dehra Dun  
Map Publication, Calcutta  
Assistant Surveyor General, Calcutta

**MODERN MAPS,** shown in bright colours, are based on the true longitude adopted in 1905.  
**OLD MAPS,** shown in purple and green were about 2 miles out of position, being based on the longitude of 1815.

**SYSTEM OF NUMBERING SHEETS.**

**THE 1/4" SERIES** forms the basis of numbering for sheets on all scales. It consists of sheets 4" x 4" on the scale of 1:1,000,000, whose numbers are shown on the Index thus: 55

**QUARTER-INCH SHEETS**—Each 1/4" sheet is divided into 16 sheets of scale quarter-inch to one mile, lettered A-P as shown on the Index. The name of each quarter-inch sheet is therefore written thus: 55.K

**HALF-INCH SHEETS**—Each 1/2" sheet is divided into four half-inch sheets, named respectively N.W., N.E., S.W., S.E. The name of a half-inch sheet thus takes the form: 55.K.N.E.

**ONE-INCH SHEETS**—Each 1" sheet is divided into 16 one-inch sheets, numbered from 1 to 16 as here shown. The name of a one-inch sheet thus takes the form: 55.K.12

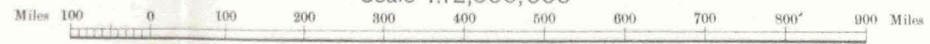
**PUBLICATIONS** up to 31st March 1930.  
on ONE-INCH and HALF-INCH scales.

**REFERENCES.**

- MODERN MAPS (since 1905).**
- Scale 1 inch to 1 mile only: (bright colors)
  - 1/2 inch " " only: (purple and green)
  - Published on both scales: (orange)
- OLD MAPS (previous to 1905).**
- Scale 1 inch to 1 mile: (grey)
  - 1/2 inch " " : (brown)

**NEW MAPS (including revised editions).**  
Published during the financial year 1929-30, one-inch + half-inch + in hand, to be published by the end of 1930, do + do +

Scale 1:12,000,000







## NOTICES

- I. Work done by the Survey of India.
- II. How to obtain maps and other publications.
- III. List of Agents for the sale of maps, etc.

## I. WORK DONE BY THE SURVEY OF INDIA.

SURVEYS of every kind can be carried out for private firms, as well as for all Government Departments, on application to the following Survey Directors:—

The Director, Frontier Circle,\* Survey of India, Simla. (Tel. "Surfrontier").  
 " " Central Circle,\* " " Mussoorie. (Tel. "Surcent").  
 " " Southern Circle,\* " " Bangalore. (Tel. "Sursouth").  
 " " Eastern Circle,\* " " Shillong. (Tel. "Suresast").  
 " " Burma Circle,\* " " Maymyo. (Tel. "Surburma").

FOREST AND CANTONMENT SURVEYS, LEVELLING, TRIANGULATION, TIDE TABLES. Advice in regard to these, and on scientific questions, is obtainable from the Director, Geodetic Branch, Survey of India, Dehra Dān, who undertakes a good deal of levelling and similar work, for municipalities and engineering projects, on payment. (Telegrams "Surtrig").

MAPS AND ILLUSTRATIONS can be printed by the Director, Map Publication, Survey of India, 13, Wood Street, Calcutta, for Government Departments only, and special maps can also sometimes be prepared, on payment. (Telegrams "Surpub").

THE MATHEMATICAL INSTRUMENT OFFICE, Survey of India, 15, Wood Street, Calcutta, supplies and repairs all kinds of optical and surveying instruments, and takes back surplus instruments, on valuation, from all Government Departments, whether Imperial or Provincial. (Telegrams "Surinst").

GENERAL ENQUIRIES should be addressed to the Assistant Surveyor General, 13, Wood Street, Calcutta, (Telegrams "Suroffice"), as the Surveyor General of India (Telegrams "Surreys") is on tour during most of the year.

### \* Provinces and States in each Survey Circle.

- |  |   |   |
|--|---|---|
| <p>1. <b>FRONTIER Circle</b><br/>                 Kashmir and Jammu<br/>                 N. W. F. Province<br/>                 Baluchistan<br/>                 Punjab and Delhi<br/>                 Punjab States<br/>                 Bikaner and States of<br/>                 W. Rajputana.<br/>                 Part of Bombay†<br/>                 Cutch</p> | <p>2. <b>CENTRAL Circle</b><br/>                 United Provinces<br/>                 Central Provinces<br/>                 (including Berār).<br/>                 Central India<br/>                 Gwalior<br/>                 Ajmer-Merwara<br/>                 E. Rajputana States<br/>                 Baroda<br/>                 Part of Bombay†<br/>                 States of Western<br/>                 India (less Cutch).</p> | <p>3. <b>SOUTHERN Circle</b><br/>                 Madras Presidency<br/>                 Madras States<br/>                 Hyderabad<br/>                 Mysore and Coorg<br/>                 Part of Bombay†</p> <p>4. <b>EASTERN Circle</b><br/>                 Bihar and Orissa<br/>                 Bengal Presidency<br/>                 Assam and Sikkim</p> |
|--|---|---|

6. **BURMA Circle**

Burma, Andaman and Nicobar Islands.

† Bombay Presidency—Sind is in the Frontier Circle.

Northern Div. in Central Circle. Remainder in S. Circle.



## II. HOW TO OBTAIN MAPS AND OTHER PUBLICATIONS

**SURVEY OF INDIA MAPS** are obtainable from the Map office, 13, Wood Street, Calcutta (*Tel. "Surmaps"*). Also to some extent from the Agents detailed overleaf and from the Directors of Survey Circles. A **MAP CATALOGUE**, which itself forms a useful atlas of India and surrounding countries, can be obtained for *Re. 1/- (Rs. 1/8 post paid)*.

**FOREST AND CANTONMENT MAPS** are obtainable from the Map Office, Survey of India, Dehra Dūn. (*Tel. "Surforest"*).

**GEOLOGICAL MAPS** are prepared by and can be obtained from the Director, Geological Survey, Calcutta.

**SURVEY PUBLICATIONS OTHER THAN MAPS** are obtainable through the Director, Geodetic Branch, Survey of India, Dehra Dūn, who will supply *gratis* a full *Catalogue* of the following :—

- (a) *Trigonometrical data*. Triangulation pamphlets, each covering one square degree, giving descriptions, positions, and heights of triangulated points and other data, with chart. Levelling pamphlets, each covering  $4' \times 4'$ , giving descriptions and heights of Bench-marks, with chart.
- (b) *Tidal Predictions*, published annually in advance as Tide Tables, for Suez and about forty ports from Aden to Burma, including Persian Gulf and Ceylon.
- (c) *Geodetic works of Reference*—Everest's Great Arc Books, the G.T.S. series of twenty-one large quarto volumes describing in detail the geodetic operations of the Great Trigonometrical Survey from 1800. Detailed accounts are given of the Baseline measurements, of the reduction of the Geodetic Triangulation treated in five portions, of the early Pendulum observations, of Telegraphic Longitude and Astronomical Latitude operations, of Tidal observations, and of Levelling of high precision.
- (d) *Historical, and General Reports*, including the "Memoirs on Indian Surveys" by Sir Clements Markham and C.E.D. Black: also Annual Reports, Narrative Reports, Record Volumes, etc.
- (e) *Miscellaneous*. Papers on Geodesy, Exploration, etc.  
(The Catalogue is also included in the Annual Geodetic Report.)

### III. LIST OF AGENTS FOR THE SALE OF MAPS, ETC.

- OUT OF INDIA.
- England.*— 1. Secretary to the High Commissioner for India (General Department), India House, Aldwych, London, W. C. 2.  
2. Edward Stanford, Ltd., 12-14, Long 'Acre, London, W. C.
- America.*— 3. C. S. Hammond & Co., 80, Church Street, Hudson Terminal, New York, and 75, State Street, Boston, Mass.
- Germany.*— 4. Dietrich Reimer, Berlin, S. W. 48.
- INDIA.
- Agra.*— 1. English Book Depot, Taj Road.
- Bangalore.*— 2. Higginbothams Ltd.
- Bombay.*— 3. Thacker & Co.  
4. D. B. Taraporevala Sons & Co.  
5. King & Co. (On probation).
- Calcutta.*— 6. Thacker Spink & Co., 3, Esplanade East.  
7. Newman & Co., 3, Old Court House Street.  
8. Automobile Association of Bengal, Park Street.  
9. City Map Agency, Govt. Book Depot, 8, Hastings St.  
10. Oxford Book & Stationery Co., 37/39, Park St.  
11. Assam Engineers and Traders, 84 A, Clive Street (On probation).
- Cawnpore.*— 12. Manager, Grand Hotel.  
13. The Indian Army Book Depot, Juhí.  
14. Advani Brothers (On probation).
- Dacca.*— 15. Provincial Library.
- Darjeeling.*— 16. Oxford Book and Stationery Co.
- Delhi.*— 17. Oxford Book and Stationery Co., Kashmere Gate.
- Dibrugarh.*— 18. Assam Engineers and Traders (On probation).
- Kashmir.*— 19. Cockburns Agency, Srinagar.  
20. Beckett & Co., Srinagar.  
21. D. G. Smith & Co., Srinagar (On probation).
- Lahore.*— 22. The Punjab Religious Book Society.  
23. J. Ray & Sons, The Mall.  
24. Oxford Book & Stationery Co.
- Madras.*— 25. Higginbothams Ltd.
- Meerut.*— 26. Oxford Book & Stationery Co.
- Mussoorie.*— 27. The Mussoorie Book Society.
- Murree.*— 28. J. Ray & Sons, The Mall.
- Muzaffarpur.*— 29. Burman & Co.
- Nagpur.*— 30. Suptd., Govt. Printing (Book Depot), Nagpur, C. P. (for maps only).
- Peshawar.*— 31. Northern Indian Book Depot.  
32. Sham Lal & Sons (On probation).
- Quetta.*— 33. Standard Book Stall, Club Corner.
- Rangoon.*— 34. The Curator, Government Book Depot, Rangoon.
- Rawalpindi.*— 35. J. Ray & Sons, 49 K & L Edwardes Road.
- Simla.*— 36. Oxford Book & Stationery Co.  
37. The Standard Book Depot.  
38. Thacker Spink & Co.

## CONTENTS

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### INDEX MAPS

1. Maps published on scales 1-inch and $\frac{1}{2}$ -inch to 1 mile	...	...	<i>Frontispiece.</i>
2. The Southern Asia Series, scale $1/2$ M (about 32 miles to 1 inch)	...	...	At end
3. The India and Adjacent Countries Series, scale $1/M$ (about 16 miles to 1 inch).	...	...	" "
4. Carte Internationale du Monde on the scale of $1/M$	...	...	" "
5. Maps published on scales $\frac{1}{4}$ -inch and $\frac{1}{8}$ -inch to 1 mile	...	...	" "



# MAP PUBLICATION AND OFFICE WORK

From 1st April 1929  
to 31st March 1930

## I.—INTRODUCTION AND PERSONNEL

1. **Annual Reports** are arranged in three separate volumes as follows:—

*General Report,*

*Geodetic Report,*

*Map Publication and Office Work Report.*

The *General Report* gives a full description of all ordinary survey operations, and only includes bare abstracts of the Geodetic and Map Publication Reports. The General Report and the Geodetic Report are for the survey year ending 30th of September, whereas the Map Publication Report corresponds with the financial year, which is more suitable for these office reports.

2. **The present report.**—*The index maps* form the most important part of this report, as they show the progress of publication to date for all standard series of modern maps, excluding trans-frontier work.

*Letterpress.* Apart from (I), the introduction, and (V), the annual report of the Mathematical Instrument Office at the end of the volume, the present report is divided into three main parts:—

(II) shows all publications and map issues for the year.

(III) shows all the fair-drawing, whether completed for publication or still in hand, carried out by the various drawing offices and field parties.

(IV) describes the work of the printing and miscellaneous offices, excluding that of the Computing and Tidal Office, whose work is of a geodetic character and published in full in the annual Geodetic Report.



**3. Personnel.****Calcutta. Director, Map Publication.—**

Lt.-Col. F. F. Hunter, D.S.O., I.A.,

**O.C., Map Publication Office**—Mr. E. B. West, to 5-1-30.**Chief Draftsman**—Mr. A. K. Mitra, R.S., from 6-1-30.***No. 1 Drawing Office.***

- O.C. Mr. Pramadaranjan Ray, R. B., to 5-1-30.  
 " " E. B. West, from 6-1-30.  
 II " Priya Nath Sur, to 11-11-29.  
 " " Amar Krishna Mitra, R.S., to 5-1-30.  
 " " F. H. Grant.  
 " " C. O. Picard, from 4-11-29.  
 " " Prafulla Chandra Mitra, to 13-11-29.  
 " " C. S. McInnes.  
 " " F. J. Grice, from 1-6-29.  
 " " J. C. St. C. Pollett.  
 " " Dharendra Nath Banerjee.  
 " " Dharendra Nath Saha, to 31-8-29.  
 U.S. " Charu Chandra Biswas.  
 " " B. B. Kuttappa, to 12-10-29.

***Engraving Section.***

- Mr. H. H. Green, Head Engraver.  
 " R. V. Rodger, Asst. Head Engraver,  
 to 2-7-29.

***Photo-Litho. Office.***

- O.C. Lt.-Col. F. J. M. King, up to 15-11-29.  
 " Major O. Slater, from 16-11-29.  
*Managers & Assistant Managers.*  
 Mr. S. Colquhoun, Manager, Litho.  
 " C. F. Oddy, " Photo.  
 " F. R. Vandyke, Asst. Manager, Photo.  
 " J. B. Chorlton, " " Litho.  
 " W. S. Armit, " " Photo.  
 from 23-10-29.

***Map Record and Issue Office.***

- O.C. Capt. G. Lennox, to 2-1-30.  
 " Lt. R. H. Sams, to 31-3-30 (forenoon).  
 " Capt. G. Lennox, from 31-3-30 (forenoon).  
 U.S. Mr. K. N. Joarder.

***Mathematical Instrument Office.***

- Mr. S. Woodhouse, Superintendent in charge.  
 " R. C. Malcolm, Asst. Supdt.  
 " A. Lucamp, Asst. Supdt.  
 " S. B. Mitra, R.S., Extra-Asst. Supdt.

**Dehra Dūn. Director, Geodetic Branch.—**

Dr. J. deGraaff Hunter, M.A., Sc.D.,

***No. 2 Drawing Office.***

- O.C. Lt.-Col. H. T. Morehead, to 28-4-29.  
 " Lt. I. M. Cadell, from 29-4-29 to 12-5-29.  
 " Mr. H. P. D. Morton, from 13-5-29  
 to 21-5-29.  
 " Lt.-Col. C. M. Thompson, from 22-5-29  
 to 30-10-29.  
 " Major T. M. M. Penney, from 31-10-29.  
 II Mr. T. F. Kitchen.  
 " " Munshi Lal.
- U.S. Mr. Jugal Behari Lal.  
 " " Muhammad Hussain, from 1-10-29.  
 " " Lakshmi Dutt Joshi, from 17-1-30.  
 " " P. B. Roy, to 17-11-29.  
 " " A. A. S. Matlub Ahmad, to 23-6-29.  
 " " Jit Singh Rawat, from 24-6-29.  
 " " Latif Khan I.

***Forest Map Office.***

- O.C. Mr. O. E. C. French, to 22-11-29.  
 " Major T. M. M. Penney, from 23-11-29.  
 II Mr. E. J. Biggie, to 1-4-29.
- U.S. Mr. C. West, from 2-4-29.  
 " Jit Singh Rawat, to 23-6-29.  
 " Abdul Majid, from 1-6-29.

***No. 16 Party (Publication and Stores).***

- O.C. Mr. H. P. D. Morton, to 12-5-29 and  
 from 31-10-29 to 10-12-29.  
 " Major T. M. M. Penney, from 13-5-29  
 to 30-10-29.  
 " Lieut. D. MoK. Berru, from 11-12-29.  
 U.S. Mr. Karuna Kumar Das, to 24-7-29.
- Photo.-Etinc. Section.*  
 Mr. A. Francis.  
*Lithopress Printing Section.*  
 Mr. Shyam Narayan, to 26-11-29.  
 " A. V. Charles, from 27-5-29.

**Simla. Director, Frontier Circle.—**

Colonel R. H. Phillimore, D.S.O.

***No. 6 Drawing Office.***

O.C. Lieut. H. W. Wright, to 14-7-29.

" " D. R. Crone, from 16-7-29.

## SURVEY SECTION.

I Lieut. D. R. Crone, from 10-7-29 to 14-7-29.

II Mr. W. H. Strong.

" " M. Ansari, to 13-1-29.

" " Nazak Chand Pari, R.S., from 27-5-29.

U.S. " Imam Din.

" " Vjdaya Dhar Chopra.

" " Mohabat Lall Kohli, (on leave from 2-1-30 to 14-3-30).

## ARMY SECTION.

Major W. Smith, (on leave from 22-3-29).

Lieut. R. M. Batt.

**Mussoorie. Director, Central Circle.—**

Lt.-Col. S. W. Sackville Hamilton, D.S.O., R.E., to 19-3-30.

" J. D. Campbell, D.S.O., R.E., from 20-3-30.

***No. 3 Drawing Office.***

O.C. Mr. P. A. T. Kenny.

II " A. B. Hunter, from 1-5-29 to 30-9-29.

" " H. T. Hughes, from 1-10-29.

" " S. M. Murtaza, to 14-3-30.

**Bangalore. Director, Southern Circle.—**

Colonel C. M. Browne, O.M.G., D.S.O., R.E., up to 29-8-29.

Major R. S. Wauchope, O.B.E., I.A., from 30-8-29 to 17-10-29.

Lt.-Col. L. G. Crosthwait, I.A., from 18-10-29.

***No. 4 Drawing Office.***

O.C. Mr. E. A. Meyer.

II " R. E. Saubhillo, from 8-10-29.

" " M. Mahadeva Mudaliar.

U.S. " V. R. Ethirajulu Nayadu.

" " R. Mariadas.

**Shillong. Director, Eastern Circle.—**

Lt.-Col. J. D. Campbell, D.S.O., R.E., to 10-3-30.

" L. O. Thuillier, I.A., from 11-3-30.

***No. 5 Drawing Office.***

O.C. Mr. B. M. Herrill, to 21-10-29.

" " P. Simpson, from 22-10-29.

II " R. C. Hanson, from 13-11-29.

" " C. O. Picard, from 26-5-29 to 28-10-29.

U.S. " Muhammad Muzaffar Shah.

" " Muhammad Siddik, from 13-11-29.

**Maymyo. Director, Burma Circle.—**

Colonel E. T. Rich, O.I.E., R.E., to 13-6-29.

Lt.-Col. H. T. Morshead, D.S.O., R.E., from 14-6-29.

***No. 7 Drawing Office.***

O.C. Mr. W. G. Jarbo, to 18-5-29 and from 19-9-29.

" " P. Simpson, from 19-5-29 to 18-9-29.

U.S. " P. C. Sen Gupta, to 31-10-29.

" " Banshi Ram.

" " L. M. Ganguli, from 8-11-29 to 9-12-29.

" " G. S. Bagechi, from 23-12-29 to 13-2-30.

## II.—PUBLICATIONS AND ISSUES

4. **Publications.**—The publications of the Department for the year are shown in the following three tables, of which Table I shows map publications, Table III letterpress publications, while Table II is merely an abstract of the publication of modern topographical maps to date.

Table I (a)—Maps published at Calcutta, during the year 1929-30.

Class of maps.	Scale.	New publica- tions.	Revised editions, new edi- tions and reprints.	Number of copies printed.	Value. Rs.
<b>GENERAL MAPS.</b>		<i>Departmental.</i>			
Maps of India ... ..	Various	3	8	23,510	80,402
<b>GEOGRAPHICAL MAPS.</b>					
Southern Asia Series ... ..	1:2,000,000	1	3	1,961	4,086
India and Adjacont Countries Series ... ..	1:1,000,000	2	13	12,980	20,792
La Carte Internationale du Monde ... ..	1:1,000,000	1	1	1,000	8,000
<b>TOPOGRAPHICAL MAPS.</b>					
Quarter-inch, Modern ... ..	1" = 4 miles	16	14	15,200	22,797
" (Prely.) ... ..	Ditto	4	6	5,486	8,179
" (Provl.) ... ..	Ditto	...	16	4,428	6,680
Half-inch, Modern ... ..	1" = 2 miles	44	20	32,174	59,987
" (Prely.) ... ..	Ditto	4	8	8,144	6,891
One-inch, Modern ... ..	1" = 1 mile	169	84	146,158	2,19,088
" (Prely.) ... ..	Ditto	8	12	14,228	21,640
" (Provl.) ... ..	Ditto	1	...	158	158
Old-style sheets ... ..	Various	...	94	12,687	17,882
<b>SPECIAL MAPS.</b>					
Provincial Maps ... ..	Various	...	8	21,880	16,781
Plans of Cities and Canton- ments ... ..	Ditto	1	6	2,010	6,595
Index Maps ... ..	Ditto	1	11	8,887	2,825
Miscellaneous Maps ... ..	Ditto	68	45	118,380	20,069
Manœuvre Maps ... ..	Ditto	...	2	1,466	3,047
<b>Total</b> ... ..	.....	<b>323</b>	<b>348</b>	<b>418,037</b>	<b>4,69,624</b>
		<i>Extra-departmental.</i>			
Maps ... ..	Various	218	82	129,958	42,227
Plans and diagrams ... ..	Ditto	142	41	68,755	7,859
Illustrations ... ..	.....	185	19	64,861	10,748
Miscellaneous ... ..	.....	80	14	86,992	5,998
<b>Total</b> ... ..	.....	<b>575</b>	<b>100</b>	<b>300,066</b>	<b>66,327</b>
<b>Grand Total</b> ... ..	.....	<b>898</b>	<b>448</b>	<b>718,103</b>	<b>5,36,951</b>

Table I (b)—Maps published at Dehra Dun.

Class of maps.	Scale.	New publica- tions.	Reprints and new editions.	Number of sheets printed.	Value. Rs.
<i>Departmental.</i>					
Cantonment maps ...	Various	...	59	6,689	5,649
Forest maps ...	"	19	81	4,865	4,708
Miscellaneous ...	"	9	6	8,674	1,442
<b>Total ...</b>	...	<b>28</b>	<b>126</b>	<b>15,178</b>	<b>11,794</b>
<i>Extra-departmental.</i>					
Maps ...	Various	99	18	95,900	12,808
Plans and diagrams ...	"	42	...	92,484	3,752
Charts ...	"	637	...	83,727	16,561
Forest maps ...	"	61	6	8,406	5,891
<b>Total ...</b>	...	<b>838</b>	<b>24</b>	<b>230,607</b>	<b>38,997</b>
<b>Grand Total ...</b>	...	<b>866</b>	<b>150</b>	<b>245,785</b>	<b>50,791</b>

Table I (c)—Maps published at Bangalore.

Class of maps.	Scale.	New publica- tions.	Reprints and new editions.	Number of sheets printed.	Value. Rs.
<i>Departmental.</i>					
Nil.					
<i>Extra-departmental.</i>					
Forest maps, Hyderābād and Mysore.	Various	6	...	250	397
Forest maps, Hyderābād	2"=1 mile	7	...	560	8,806
Private Estates ...	Various	6	3	195	412
Do. ...	16"=1 mile	44	...	519	9,946
Plans and diagrams ...	Various	20	4	5,402	1,607
<b>Total ...</b>	...	<b>85</b>	<b>7</b>	<b>6,926</b>	<b>16,170</b>

Table I (d)—Maps published at Quetta.

Class of maps.	Scale.	New publications.	Reprints and new editions.	Number of sheets printed.	Value. Rs.
<i>Departmental.</i>					
Maps ... ..	Various	35	8	409	848
Plans and diagrams ... ..	"	31	...	8,030	295
Charts } Forms }	"	4	...	222	50
<b>Total ... ..</b>	...	<b>70</b>	<b>8</b>	<b>3,661</b>	<b>693</b>
<i>Extra-departmental.</i>					
Maps ... ..	Various	51	8	6,345	1,820
Plans and diagrams ... ..	"	1,859	...	30,340	10,214
Charts } Forms }	"	13	...	1,300	209
<b>Total ... ..</b>	...	<b>1,423</b>	<b>8</b>	<b>37,985</b>	<b>12,243</b>
<b>Grand Total ... ..</b>	...	<b>1,493</b>	<b>11</b>	<b>41,646</b>	<b>12,936</b>

Table I (e)—Maps published at Murree and Peshawar.

Class of Maps.	Scale.	New publications.	Reprints and new editions.	Number of sheets printed.	Value. Rs.
<i>Departmental.</i>					
Plans and diagrams ... ..	Various	...	...	2,418	699
<b>Total ... ..</b>	...	...	...	<b>2,418</b>	<b>699</b>
<i>Extra-departmental.</i>					
Maps ... ..	} Various	88	...	21,633	3,147
Plans and diagrams ... ..					
Charts } Forms }					
<b>Total ... ..</b>	...	<b>88</b>	...	<b>21,633</b>	<b>3,147</b>
<b>Grand Total ... ..</b>	...	<b>88</b>	...	<b>24,051</b>	<b>3,846</b>



Table II.—Abstract of Modern Topographical Maps.

	One-inch sheets.	Half-inch sheets.	Quarter-inch sheets.
Topographical maps published in 1929-30	177	48	20
Do. do. published in previous years	2,731	747	285
Total published ...	2,908	795	255
Number of sheets in India ...	6,218	1,630	450

5. **Notes.**—*Calcutta.*—In addition to the work shown in Table I(a), material for the original mapping of the Eastern and Burma Circles, and for the compiled mapping of all Circles, and for numerous extra-departmental maps, was supplied. Nine indexes, in colours, for the General and Map Publication Reports and Supplement, were printed.

The Guide for the preparation of Grid Originals was published.

36 sheets were published with the new grid in supersession of the minute mesh.

6. *Dehra Dun.*—In addition to the work shown in Table I(b) above, 81,078 prints of 1,573 originals, consisting of plane-table sections, triangulation charts and pamphlets, and forest maps were printed.

7. *Quetta.*—Included in Table I(d) is the Western Command Manœuvre Map, 1929, prepared by "E" Company from air photographs. During the preparation of this map, a large number of photographic reductions were made of original photographs and celluloid strips, for use in indexing and compilation.

Table III.—Letterpress publications.

(a) PUBLISHED AT CALCUTTA.

- Confidential Supplement to the General Report, 1928-29.—(160).\*
- Map Publication and Office Work Report, 1928-29.—(800).
- Survey of India Catalogue of Maps.—(1,200).
- Correction slips to Topo Handbooks. Type Table, Border Specimen, Conventional Signs, etc.—(100,000).
- Government of India Orders and Circular Orders and Circular Memos., etc.—(4,000).
- Survey of India Notes,—issued monthly.—(350).
- List of Maps published,—issued monthly.—(800).
- Notes for recent publications of the Survey of India Maps.—(8,000).
- Rules for map agents.—(500).
- Rules for the execution of Lithographic and Photographic work for the public service or on payment.—(800).
- List of Maps published,—issued quarterly.—(200).
- Instructions for applicants for appointment as Class II officer in the Survey of India.—(1,000).
- Application form for Class II officers of the Survey of India.—(500).
- Memorandum on the competitive examination for Class II officers.—(500).
- Index for Map Catalogue.—(2).
- Notices and List of Agents for the Sale of Maps, &c.—(16,200).
- Index Sheet No. 78 for the Survey of India Catalogue of Maps.—(2).
- Qualification Card.—(2,000).
- Price notes.—(600).
- Rules for the guidance of officers conducting the Class II service examinations.—(300).
- Agreement form for the Class II service.—(800).

\* Numbers in brackets after each item denote the number of copies printed.

Table III (a)—(Contd.).

22. Instructions for applicants to the Upper Subordinate service of the Survey of India.—(600)\*.
23. Addenda and Corrigenda to Regulations on the subject of Language Examinations applicable to Officers of the Survey of India.—(450).
24. Particulars of Indent.—(1,000).
25. List of Type Fonts compiled by No. 1 Drawing Office, Survey of India.—(100).
26. Rules for overtime work in Circle and Party offices.—(800).
27. Calendars for 1980.—(1,600).
28. Survey of India Camp Officer's Record Book.—(200).
29. List of returns to be submitted by Directors to the Surveyor General of India.—(800).
30. Annual Indents for European Stores.—(Various.).

## (b) In hand at Calcutta.

1. Survey of India General Report, 1928-29.
2. Correction slips to Topo Handbooks, Conventional Signs, etc.
3. Government of India Orders and Circular Orders, etc.
4. Statement of returns due to and from Director, Map Publication, corrected to 1-3-30.
5. Miscellaneous departmental forms.

## (c) PUBLISHED AT DEHRA DUN.

1. Geodetic Report, Vol. III, 1926-27.—(450).
- 1a. Correction slip to Geodetic Report, Vol. III, 1926-27.—(450).
2. Geodetic Report, Vol. IV, 1927-28.—(450).
3. Professional Paper No. 22 (Three sources of error in Precise Levelling).—(250).
4. Professional Paper No. 23 (Air Survey of Waziristan 1923—1928).—(150).
5. Do. do. No. 24 (Notes on Air Survey in India).—(800).
6. Do. do. No. 25 (The representation of glaciated regions on maps of the Survey of India).—(500).
7. Correction slip to Professional Paper No. 25 (The representation of glaciated regions on maps of the Survey of India).—(500).
8. Government of India Orders, 1919—1924.—(450).
9. Circular Orders (Administrative), 1919—1924.—(450).
10. Tide Tables for Indian Ports for 1980.—(6,425).
11. How to obtain maps.—(4,000).
12. 4 Triangulation Pamphlets.—(100 of each).
13. 1 Addenda to Triangulation Pamphlet.—(100).
14. 141 Correction slips to Triangulation Pamphlets.—(14,001).
15. 1 Levelling Pamphlet.—(200).
16. 9 Addenda to Levelling Pamphlets.—(821).
17. 15 Secondary Levelling Lines.—(100 of each).
18. 1 Secondary Levelling Line.—(200).
19. 1 Addenda to Secondary Levelling Line.—(200).
20. 1 Correction slip to Secondary Levelling Line.—(250).
21. English Indent for Printing Office.—(15).
22. Do. do. for Geodetic Branch.—(15).
23. Addenda to Auxiliary Tables 44 & 44 A. Sur.—(820).
24. Calendar for Geodetic Branch, (Provisional).—(100).
25. List of names for Dehra Guide map.—(4).
26. 15 Lists of bench marks.—(3 of each).
27. 55 Correction slips to The Geodetic Library Catalogue.—(120 of each).
28. 1 Do. slip to Accounts Pamphlet.—(800).
29. 2 Do. slips to The Tides (Geodetic Hand Book Part V).—(500 of each).
30. 1 Do. slip to Auxiliary Tables, Part II.—(500).
31. 1 Do. do. to the Forest Map Office Catalogue.—(125).
32. 1 Do. do. to Professional form.—(13,000).
33. 6 Captions for Museum exhibits.—(3 of each).
34. Outer cover for Record Vol. XVII.—(8).
35. Qualification Report form for Lower Subordinates.—(2,000).
36. Road Map reference for the United Provinces.—(2,000).
37. Cover for Departmental Paper No. 12 (Geodesy).—(100).

\* Numbers in brackets after each item denote the number of copies printed.

38. Cover for Professional Paper No. 26—(100).\*
39. Lt.-Colonel Hamilton's report on Reproduction methods of Ordnance Survey (100).
40. List of Publications corrected up to 31st January 1929.—(100).
41. 22 Covers for Photozinoographed Triangulation Pamphlets.—(100 of each).
42. Primary bench marks for 8 Levelling Pamphlets and 1 Levelling Addenda.—(247).
43. 398 miscellaneous jobs.—(2,49,699).
44. 168 Professional forms.—(1,42,591).

In addition to work shown above Printing Office (Binding Section) has bound Library books and registers and other miscellaneous jobs &c. (6,747), 22 Photozinoographed Triangulation Pamphlets (2,200 copies), correction slips pasted (570), forms ruled (48,294) and forms performed (4,070).

(d) In hand at Dehra Dūn.

1. Tide tables for Indian Ocean, 1931.
2. Auxiliary Tables, Part III.
3. Geodetic Report, Vol. V.
4. Professional Paper No. 26.
5. Topo Handbook, Chapter III.
6. 2 Levelling Pamphlets.
7. 30 Triangulation Pamphlets (18 complete and are awaiting charts).
8. List of names for Mussoorie Guide map.
9. List of publications corrected up to 31st January 1930.
10. List of Reserves in Chhindwara Forest Division.

**8. Map issues.**—The following table shows the number of maps issued during the year.

Table IV.—Maps issued by Survey units.

D = Departmental	X = Extra-departmental.	ON BOOK TRANSFER (TO GOVERNMENT OFFICIALS).		ON CASH PAYMENT.		FREE ISSUES.		TOTAL.	
		Number of copies.	Sale Value. Rs.	Number of copies.	Sale Value. Rs.	Number of copies.	Face Value. Rs.	Number of copies.	Sale Value. Rs.
Calcutta	D	99,845	80,044	98,426	1,06,146	77,213	1,14,166	275,484	1,86,190†
	X	205,819	43,266	85,199	22,839	3,414	914	294,732	66,105†
Dehra Dūn	D	6,914	7,001	1,407	2,392	13,335	24,618	21,656	9,393†
	X	226,090	39,136	1,632	2,090	.....	.....	227,722	41,226
Simla	D	.....	.....	211	350	229	365	440	350†
Rāwalpindi ("A" Company)	D	.....	.....	20	20	.....	.....	20	20
Quetta ("E" Company)	D	170	342	55	82	.....	.....	225	424
	X	27,241	10,290	10,744	1,953	.....	.....	37,985	12,243
Peshāwar (No. 18 Party)	D	.....	.....	22	36	2,418	699	2,440	36†
	X	300	138	21,333	3,009	.....	.....	21,633	3,147
No. 22 Party	D	.....	.....	5	8	.....	.....	5	8
Mussoorie	X	.....	.....	310	475	.....	.....	310	475
Bangalore	D	1,433	2,319	5,801‡	11,467	.....	.....	7,234‡	13,786
	X	.....	.....	5,847	2,416	.....	.....	5,847	2,416
Shillong	D	2	11	1,419	2,250	.....	.....	1,421	2,261
Maymyo	D	778	1,249	810	1,198	263	551	1,851	2,747†
<b>Totals</b>	...	<b>568,592</b>	<b>1,83,796</b>	<b>233,541</b>	<b>1,57,031</b>	<b>96,872</b>	<b>1,41,313</b>	<b>899,005</b>	<b>3,40,827</b>

\* Number in brackets after each item denote the number of copies printed.

These figures do not include the value of free issues.

‡ Includes 14 Map Catalogues.

**9. Map Record and Issue Office.**—The total number of departmental maps sold during the year was 198,271, being an increase of 75,516 or nearly 62% over the previous year's sales. The proceeds also were greater by Rs. 36,095, the increase for cash sales alone being Rs. 27,063. A comparatively large number of maps were taken on book transfer by the Indian Statutory Commission, but the satisfactory state of affairs, especially with regard to cash sales, is mainly attributable to the new organization, more efficient methods of advertising and the introduction of suitable booklet maps, designed to attract the general public.

The figures for extra-departmental maps show a decrease, the proceeds being less by Rs. 5,643, but the Map Record and Issue Office is only concerned with the despatch of these and with the collection of payments due.

The total number of maps of all kinds issued by the Map Record and Issue Office during the year was 570,216 and the total takings were Rs. 2,52,295. The average number of maps sent out from the office per complete working day being about 2,337.

132 new steel almirahs with a capacity of 2,302 shelves were erected during the year. All published maps are now stored in these almirahs and similar accommodation for originals and records is well in hand and will be completed within the next few months.

The map mounting machine ordered from England has been installed, and, after several months of experiments, is now giving satisfactory results, several hundred maps being mounted daily. Further improvements are being fitted to the machine, and attempts are being made to obtain regular and cheap supplies of suitable cloth and adhesive locally, instead of from England.

**10. Stock of Maps.**—*Calcutta.* The table below gives the stock of maps as it stood on 31st March 1930:—

Class of maps.	Number of copies in stock.	Present Face Value Rs.
1/2M Southern Asia Series ... ..	9,868	19,876
1/M India and Adjacent Countries ... ..	44,429	86,431
1/M Carte Internationale du Monde ... ..	4,815	14,412
One-inch sheets ... ..	1,188,099	17,07,148
Half-inch sheets ... ..	310,307	6,20,582
Quarter-inch sheets ... ..	190,774	2,72,967
General Maps of India ... ..	20,146	80,910
Provincial Maps of India ... ..	7,639	26,761
Cantonment and Town Maps ... ..	44,244	1,31,746
Miscellaneous Maps ... ..	63,489	86,744

**11. Dehra Dūn.**—A comparison of Table I(b) with Table IV shows that, during the year, 245,785 sheets were published, and 249,378 sheets issued. Stocks in hand have decreased by 3,593 sheets. The total stock in hand in Dehra Dūn is estimated at 347,899 (including 4,209 sheets received from Calcutta).

12. *Bangalore*.—The stock of maps on 31st March 1930 was as follows.—

Class of maps.	Number of copies in stock.	Value Rs.
1-inch, $\frac{1}{2}$ -inch, $\frac{1}{4}$ -inch and 1/M sheets ...	35,109	56,255
Miscellaneous maps ... ..	3,699	6,875
<b>TOTAL</b> ...	<b>38,808</b>	<b>63,130</b>



### III.—WORK OF DRAWING OFFICES.

13. Tables V to VII give an abstract of new maps, reprints and new editions completed for publication and also those in hand during the year, for the whole department.

#### GENERAL REMARKS.

**No. 1 Drawing Office**—a number of engravers from the Engraving Section have been employed during the year in the Geographical Mapping Section on the hand-drawing of originals of the 1/M India and Adjacent Countries, 1/M Carte Internationale du Monde and 1/2M Southern Asia Series in accordance with the decision to hand-draw these originals in future. This has resulted in some curtailment of the work in the Engraving Section which is now employed mainly on extra-departmental work and on the new Calcutta and Howrah Guide Map.

The General Staff having decided to abandon the minute mesh hitherto surprinted on certain maps, in favour of a grid on the British Modified System, a "Guide for the preparation of Grid Originals" has been drawn and a special section formed for dealing with work of preparation of grid originals.

**No. 2 Drawing Office.**—In addition to the work reported in Table V, the preliminary 8-mile map of Nepāl (without hills) and the half-inch map of Mount Everest and Environs have been completed and submitted for publication. A revised edition of the Dehra Dūn Guide map and a General map of Port Blair Settlement are nearing completion. In addition to its normal work this office is re-drawing 6 quarter-inch sheets in the Frontier and Central Circle areas.

**No. 3 Drawing Office.**—The Guide Map of Mussoorie and Landour, scale 8 inches to one mile, and the Road Map Mussoorie to Simla, scale 1 inch to 4 miles, were brought up to date. A special stump shading sheet for the former was prepared. Both maps were submitted to the Geodetic Branch for publication.

**No. 4 Drawing Office.**—A road map on the scale of 8 inches to 1 mile was drawn for the Mysore Government and is in course of printing. A road map on the same scale was also prepared of the Kadur District of Mysore State and 225 copies were supplied to the Economic Superintendent of that district.

**No. 6 Drawing Office, Simla.**—*Survey Section*—In addition to the work reported in the Table III, a special 1/2 M Map of Baluchistān was prepared for the Archæological Department. The detail was to be reproduced in three colours and the hills were depicted by brush shading. The map is to be reproduced in England.

A special feature of the guide map of Simla Hills reported in Table III is the method of showing wooded areas by green trees instead of the usual green wash or tint.

The Army Section was employed in the preparation of maps and plans for the Army and various Government Departments. Details of this work will be found in the Confidential Supplement 1929-30.

### III.—WORK OF DRAWING OFFICES, (1929-30)

Table V.—New maps.

Figures in italics denote work in hand.

	TOPOGRAPHICAL.					GEOGRAPHICAL.						GENERAL AND SPECIAL.				ACCESSORY.			MISCELLANEOUS.			OFFICE COPIES.													
	2-inch.	1-inch.	½-inch.	¼-inch.	1/8-inch.	1/M.		CARTE INTERNATIONALE.		1/2M.		Guide Map.	Road Map.	Forest & Cantonment.	India 128-mile.	Gridding and Meshing.	Shading.	Colour Patterns.	Indexes.	Charts.	Various.	New.	Old, corrected.												
						Helio.	En-graved.	Helio.	En-graved.	Helio.	En-graved.																								
<b>No. 1 Drawing Office</b> ...	...	7	4	...	1	1	...	...	...	3(b)	...	1	...	1(e)	...	...	...	85	163	39	33	...	...	1	2	...	...	904	...						
<b>No. 2</b> ..	...	...	...	...	11	3	...	...	...	1	...	1	...	1(f)	...	...	...	1	2	...	14	...	24	7	13	20	...	168	155						
<b>No. 3 Drawing Office</b> ...	...	...	5	15	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...						
<b>No. 4 Drawing Office</b> ...	...	...	10	7	4	8	...	...	...	...	...	...	...	...	...	...	...	...	...	64	26	...	...	...	...	...	...	111	56						
<b>No. 5 Drawing Office</b> ...	...	...	9	12	2	2	...	...	...	...	...	...	...	...	...	...	...	7	...	...	60	11	...	...	...	...	...	108	442						
<b>No. 6 Drawing Office</b> ...	...	7	7	2	2	...	...	...	...	...	...	...	...	1(l)	...	...	...	33	13	...	54	...	...	...	...	...	...	112	48						
<b>No. 7 Drawing Office</b> ...	...	1	2	8	5	6	4	...	...	...	...	...	...	1(k)	...	...	...	2	2	...	29	5	...	...	10	2	...	30	41						
<b>Forest Map Office</b> ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	30	...	...	63	17	138	795					
<b>Cantonment</b> ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...					
<b>Total</b> ...	152	13	37	52	27	43	3	2	14	1	1	...	...	4	1	10	8	101	20	1	1	128	17	164	39	289	42	24	37	24	28	66	19	1,578	1,543
<b>Total to date</b> ...	3,055	844	281	...	...	...	78	22	1	18	1	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>Total for India</b> ...	6,218	1,630	450	...	...	...	104	104	41	...	...	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

#### References

Scales:—*x*-inch means *x* inches to 1 mile.

*x*-mile 1 inch to *x* miles.

1/M means 1:1,000,000 or 1:014 inches to 16 miles

1/2M .. 1:2,000,000 or 1:014 .. .. 32 ..

(a) Includes 7 revised editions.

(b) Revised editions.

(c) Calcutta-Howrah Guide Map.

(d) Includes 3 revised editions (new compilation).

(e) Revised editions " "

(f) Includes 5 revised editions (new compilation).

(g) Compilation of the N. E. portion.

(h) Hyderabad & Surrounding Country.

(i) Trichinopoly, Madura, Kumbakonam & Tanjore Guide maps.

(j) Simla Hills ¼-inch.

(k) Maymyo Guide Map, 1:20,000.

(l) Rangoon Guide Map, 3-inches to a mile in 2 Sections.

(m) Rangoon and Environs, 1 inch to a mile.

(n) Multan, Murrec and Nathia Gali.

Table VI.—Miscellaneous.

<b>No. 1 Drawing Office—</b>	<b>Cantonment Office—</b>	<b>No. 5 Drawing Office—</b>
Originals corrected against press order proofs ... 287	<b>No. 3 Drawing Office—</b>	Special sheets for Rāniganj coal-fields area for ... 2
Area statements of published sheets checked & entered in register ... 193	Compilation of topographical triangulation in degree sheets ... 5	Geological Survey of India ... 1
Mosaics (congregated rough maps prepared for photography) ... 116	Compilation of triangulation and traverse data for extra-departmental requirements ... 63 pages.	Shillong Guide Map ... 1
Mesh originals modernized or scrutinized and corrected ... 54	Mosaics for Bhopal ¼-inch work prepared ... 3	<b>No. 6 Drawing Office.—</b>
Published maps corrected by hand ... 1,194	Party sheets examined and part corrected ... 41	Special ... 8
Miscellaneous cases (including 31 extra-deptl. maps and 10 engraved plates) ... 253	Mapping of 1 inch to 1 chain scale of part of Castle Hill Estate ... 1	Party sheets examined: "A" Coy. ... 5
<b>No. 2 Drawing Office—</b>	<b>No. 4 Drawing Office—</b>	" " " " "E" Coy. ... 12
Miscellaneous cases (including 65 extra-departmental maps) ... 157	Special Forest maps, Hyderabad State ... 20	<b>No. 7 Drawing Office.—</b>
Mosaics ... 5	Map of Sāvantwādi State ... 1	4-inch Myanaung Plain Maps ... 12
<b>Forest Map Office—</b>	Maps of various estates, tea, coffee, etc. ... 44	Wa States Map ... 1
Sheets coloured for indents ... 162	" " Sandur State mining concession ... 1	
Areas extracted, no. of sheets ... 100	" " cave temples, Kāthiāwār, Salsette, Borghāt, Nāsik etc. ... 4	
Originals corrected ... 57	Guide maps of Bidar Fort and Mandu Fort ... 2	
No. of sheets passed for publication ... 65		

### III.—WORK OF DRAWING OFFICES, (1929-30)

Table VII.—Re-issues

*Reprints—No changes in map.    New editions—Slight alterations.    Revised editions—Considerable changes.*

	MODERN MAPS INCLUDING PRELIMINARY EDITIONS.								OLD-STYLE, INCLUDING PROVISIONAL ISSUES.			GENERAL AND SPECIAL.							
	TOPOGRAPHICAL.				GEOGRAPHICAL.				1-inch.	½-inch.	¼-inch.	Dis-trict.	Rail-way.	India.	Forest.	MISCELLANEOUS.			
	2-inch.	1-inch.	¾-inch.	½-inch.	1/M. Holo.	1/M. En-graved.	1/M. Carte Interna-tionale.	1/2 M.								Province Maps.	Cantt. 8-inch, 12-inch, 16-inch, 24-inch.	Guide Map.	Various.
<b>No. 1 Drawing Office—</b>																			
Reprints ...	...	...	...	...	...	...	...	...	69	10	14	...	...	...	...	...	...	1	...
New editions ...	...	50	28	20	3	2	4	...	...	...	1	1	1	...	4	...	1	1	1
Revised „ ...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	1
<b>No. 2 Drawing Office—</b>																			
New editions ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Revised „ ...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>No. 3 Drawing Office—</b>																			
New editions ...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Revised „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>No. 4 Drawing Office—</b>																			
New editions ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Revised „ ...	...	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>No. 5 Drawing Office—</b>																			
Revised edition ...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>No. 6 Drawing Office—</b>																			
New editions ...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Revised ...	...	2	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>No. 7 Drawing Office—</b>																			
New editions ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Revised „ ...	...	6	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>Frontier Circle Parties—</b>																			
New editions ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Revised „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<b>Forest &amp; Cantonment Office—</b>																			
Reprints ...	...	...	...	...	...	...	...	...	...	...	...	...	...	77	...	...	...	...	...
New editions ...	...	...	...	...	...	...	...	...	...	...	...	...	...	50	...	...	...	...	...
Revised „ ...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	...	...
<b>Totals ...</b>	...	<b>62</b>	<b>34</b>	<b>31</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>1</b>	<b>69</b>	<b>10</b>	<b>14</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>134</b>	<b>5</b>	...	<b>2</b>	<b>4</b>

#### References.

Scales:—*x*-inch means *x* inches to 1 mile.

*x*-mile „ 1 inch to *x* miles.

1/M means 1:1,000,000 or 1'014 inches to 16 miles.

1/2M „ 1:2,000,000 or 1'014 „ „ 32 „



#### IV.—PRINTING AND MISCELLANEOUS.

14. **The Photo-Litho. Office, Calcutta.**—The following tables show the cost and outturn of the Photo-Litho. Office and the independent outturn of the Process Engraving Section and Type Section in letter-press work.

A new Guillotine machine has been installed and the old machine has been handed over to the Map Record and Issue Office. Both machines are working satisfactorily and the offices now have a reserve for break-downs and are able to cope with rush orders. An offset proving and duplicating press has also been installed and is working satisfactorily.

The total number of impressions pulled is less than last year, but the value of work done at office rates is higher.

The increase in costs over last year's figure is due to the installation of new machinery and the replacement of some expensive articles of photo apparatus as well as to the fact that in 1928-29 some of the European staff were on leave.

No innovations have been introduced during the year but various improvements have been introduced to deal with the non-registration of tints. The increased publication of large size tinted guide maps, in which poor registration is accentuated, have necessitated these improvements, but at present they are still in the experimental stage. Uneven expansion of the tint originals, even when they are mounted on zinc, is the chief cause of the trouble.

##### COST AND OUT-TURN OF PHOTO-LITHO. OFFICE.

Expenditure.	Value of out-turn at office rates.	Negatives prepared.	Zinc plates prepared.	MAPS PRINTED.		Impressions pulled.
				Departmental.	Extra-departmental.	
<b>Rs.</b>	<b>Rs.</b>					
<b>5,03,848</b>	<b>5,76,268</b>	<b>7,500</b>	<b>8,524</b>	<b>769</b>	<b>2,268</b>	<b>4,016,945</b>

##### INDEPENDENT OUT-TURN OF THE PROCESS ENGRAVING AND TYPE PRINTING SECTIONS.

PROCESS ENGRAVING SECTION.					TYPE PRINTING SECTION.		
HALF-TONE WORK.		LINE WORK.		PHOTO-GRAVURES.			
Blocks prepared.	Impressions pulled.	Blocks prepared.	Impressions pulled.	Plates prepared.	Items or pages published.	Copies printed.	Impressions pulled.
<b>316</b>	<b>80,848</b>	<b>93</b>	<b>225,660</b>	<b>6</b>	<b>2,428</b>	<b>1,509,474</b>	<b>2,689,128</b>

##### Copper-plate printing.—

The out-turn of this section was 12,325 impressions consisting of 29% of scales, 32% miscellaneous and 39% photogravure impressions.

### 15. No. 16 (Publication and Stores) Party, Dehra Dūn.—

*Photo.-Zinco Section.*—Details of work given in Table I (b).

An extension was built to house the second Rotary Offset Machine received last year. This machine has now been erected. To run it a re-arrangement of the electric power supply is required. Each printing machine should be fitted with its own motor and to obtain satisfactory variable speed control these motors should be Direct Current Motors. The Dehra Dūn supply is Alternating Current hence a convertor set is required. A 5 K.W. set and a 3 h.p. D.C. motor has been ordered. With this and the 3 h.p. D.C. motor received with the Rotary machine last year, there will be satisfactory power for the two rotary machines, while the 3 Flat bed machines and graining machinery will continue to be run from shafting driven by the 15 h.p. motor installed last year, pending the construction of the proposed new buildings for the Photo.-Zinco Office, when the installation of further convertor sets and motors will be carried out.

Satisfactory experiments were carried out in lifting and moving a fully erected Rotary machine for loading on to a lorry. It is hoped to carry out further experiments in actually loading a machine on to a lorry—though the lack of lorries in India capable of carrying 5 tons may present some difficulties.

The personnel of the Photo.-Zinco Office has been considerably increased during the year. Four trained 3rd Division assistants have been lent by the Photo.-Litho Office Calcutta to assist in training recruits, twentytwo of whom have been enlisted and are being trained. This increase has been made with a view to having sufficient personnel for mobilization. Further increase will be necessary but is at present limited by lack of accommodation.

Preliminary plans for a new building to provide this accommodation and to house further mobilization machinery have been got out.

The Duplicating and Reversing Press which was received last year was brought into use and satisfactory experiments have been carried out in Duplicating, Reversing and Combining plates. This combination has been done by using beam compasses in lieu of the Macleod Bar, while a Macleod Bar of local design has been made in the Workshops and should prove satisfactory pending the receipt of the real article.

The Rotary Machine erected last year has been working satisfactorily and several coloured jobs have been printed on it.

*Letterpress Printing Section.*—The work of this section is given in Table III (c).

This section has been considerably reorganised during the year and several improvements and economies in method have been introduced.

*Business Section.*—This section is responsible for the storage and sale of publications and the collection of bills for work printed by the Photo.-Zinco Office. As an experiment and to avoid duplication of work, this section was attached to the Forest Map Office and Map Record Section of the Drawing Office, so that all storage and sales should be combined in one office. This experiment has proved satisfactory and, when accommodation is available, it is proposed to keep all Forest Maps, Survey of

India maps and publications in one office, which will be responsible for their storage, distribution and sale—in other words create a small branch Map Record and Issue Office in Delhra Dūn.

**16. Bangalore.**—In addition to the work shown in Table I (c), the Photo-Zinco. Section of No. 4 Drawing Office, Bangalore, reproduced 114 plane table sections for parties. It also prepared 463 vandyked plates. The total number of pulls in the hand presses was 17,947.

**17. No. 18 (Air-Survey) Party.**—The party has received enough work to keep two presses employed.

The new portable press referred to last year has been sent to "E" Company and the press for this party is still in Mathematical Instrument Office.

A 12-inch by 12-inch copying camera was received from England last year and black enlargements or reductions of plane-table sections are now prepared for "A" Company. This camera has also been extensively used to provide reductions of strips used in air-survey compilation.

The following is a summary of the work of the section:—

Reproductions of originals received	...	...	484
Plates prepared by vandyke process	...	...	89
Plates prepared by helio process	...	...	261
Prints pulled	...	...	21,602

**18. "E" Company, Quetta.**—The reproduction section has been fully occupied throughout the year, almost entirely on payment work. The majority of the work has been in black only, though several maps have been printed in colours.

A new graining machine and a double-elephant proving press, both power driven, have been installed during the year, and are very satisfactory. An imperial proving press (hand drive) has also been installed, and was used on Western Command Manœuvres, 1929.

The Chase's pattern portable press, as originally designed, had its main roller supported, throughout its length, dry. 4 lubricated bearings have now been fitted, and the press is entirely satisfactory so far as used since the alteration was made (about 1,200 pulls).

A copying camera has been installed, and some alterations in the office building made to accommodate it and to facilitate reproduction work generally. Considerable photography was carried out in connection with the preparation of the Western Command Manœuvre Map, 1929, from air photographs; 112 negatives and 250 bromide prints having been made. The section also attended Western Command manœuvres, where vandyking was carried out by means of electric light supplied by the 2nd Indian Divisional lorry. No difficulty was experienced in vandyking by this means.

Reproductions of originals received:—

In one colour	...	...	1,627
In two colours	...	...	80
In three colours	...	...	18
		<b>TOTAL</b>	<b>1,670</b>
Vandyke plates prepared	...	...	1,045
Prints pulled	...	...	20,864

## V.—MATHEMATICAL INSTRUMENT OFFICE

19. At the request of the Principal, Government Engineering School, Nagpur, C. P., an instrument maker of the School was given training in Mathematical Instrument Office for 3 months, from May to July 1929, in the minor repairs and adjustment of surveying instruments &c.

The following Ordnance Mechanical Engineers were also given facilities to learn the methods of repairing and manufacturing instruments and in studying the appliances, with a view to adopting them in Arsenal Workshops:—

Armt. Staff Sergt. W. A. Deaville, accompanied by Lt.-Col. R. F. Barbour, A.D.O.S. (Tech.), Lt. W. Burdon, Major J. D. White, and Major W. J. Glanville.

Discussions on the advantages of a repair programme of all military stores, disposal of surplus military stores economically through the Mathematical Instrument Office, conversion of optical instruments and inspection of the army instruments were held at intervals with Lt.-Col. J. Morrison, I.A.O.C., offg. Director of Artillery, Brigadier L. A. Fanshawe, D.S.O., &c., Director of Ordnance Services and Captain P. J. Gibbs, Assistant Director of Contracts.

The Mathematical Instrument Office undertook to sell a large stock of surplus second-hand binoculars &c. on behalf of the Army Department, sale proceeds of which amounted to Rs. 2,774-0-0.

Stock-taking of the Serviceable and Repairable instruments and Material store was carried out twice during the year, and the accounts for the financial year 1928-29 were audited by the staff of the Commercial Audit Branch of the Government of India, in course of which Mr. A. C. Badenoch, I.C.S., Director, Commercial Audit, viewed the Mathematical Instrument Office workshops and different processes, in connection with the introduction of the cost accounting system under contemplation.

Messrs. H. Wild & Co. of Heerburg, Switzerland, communicated their thanks to the Mathematical Instrument Office for its constructive criticism of their new theodolites and also confirmed the Mathematical Instrument Office diagnosis of various defects which had developed in them during field service.

Besides the ordinary manufacture and repairs, the following special jobs were carried out in the Mathematical Instrument Office workshop:—

(a) The *manufacture* of:—1 Sounding Reel to carry 300-ft. wire for use with portable steel boats—for Punjab Irrigation; 1 Wireless Direction Finder—for Bengal Pilot Service; 1 Illuminated Stereoscopes—for Frontier Circle, Survey of India; 12 Slide Rules Wave length, and 1 sample Slide Rule in duralmin to replace the present celluloid and wooden pattern—for the Army Department; 2,023 Plano-Convex lenses, 181 Prisms for Binoculars, 407 Graticules for Binoculars and Dial Sights, 595 Diaphragms for Levels and Theodolites, and 1,252 Colour Glasses for Telescopes and Compasses—for stock.

(b) The *repairs* of:—4,600 Binoculars, 340 Telescopes, 280 Rangefinders, 170 Dial Sights, 810 Watches, and 240 Compasses—for the Army Department; 68 Hydrometers—for the Customs, Excise and Salt Depart-



ments; 1 Electro-Cardiograph and 1 Incubator—for the Calcutta Medical College; 1 Co-ordinatograph—for the Air Survey and Transport, Limited; 140 Microscopes and 371 Objectives—for the Medical Department.

Spray painting of Measuring Rods, etc. and experiments in varnishing maps with cellulose varnish by spray machine are being carried out, for which construction of a special room is under contemplation. Experiments are also being carried out for the manufacture of Quintant Mirrors in stainless steel and one set is on trial.

The compass testing room and observatory under construction on the roof, is nearing completion and is expected to be ready for use by the Inspection staff of the Army Department before April 1930.

The following comparative table shows a decrease in the demands on this office for the supply of instruments, but the repair and the workshop manufactures are approximately the same as in the previous year, *vide* items 1, 2 and 5(a) respectively—

	1927-28.	1928-29.	1929-30.
	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
1. Total value of stores issued ...	5,60,829	5,39,308	4,20,131
2. " " " repairs carried out to orders ...	1,54,092	2,44,069	2,21,510
3. " " " instruments &c. returned to store ...	68,760	82,356	44,921
4. <i>Book value of stock in—</i>			
(a) Servicable store ...	2,87,839	3,09,875	4,10,839
(b) Repairable " ...	97,799	96,260	1,06,575
(c) Material " ...	2,01,072	2,02,847	2,00,288
5. <i>Value of new instruments—</i>			
(a) Manufactured in workshop ...	2,92,781	1,90,921	1,79,842
(b) Purchased locally ...	98,964	46,898	28,363
(c) Imported through the Stores Department, London ...	2,47,824	2,30,876	2,31,128
6. Total value of work done in the workshop ...	5,49,208	5,76,546	5,25,686
7. Value obtained by sale of obsolescent and condemned stores ...	367	1,980	1,148
8. <i>Employees—</i>			
(a) Average number ...	461	480	490
(b) Cost of employees including pension contribution ...	1,76,572	1,98,598	2,02,734



## INDEX MAPS

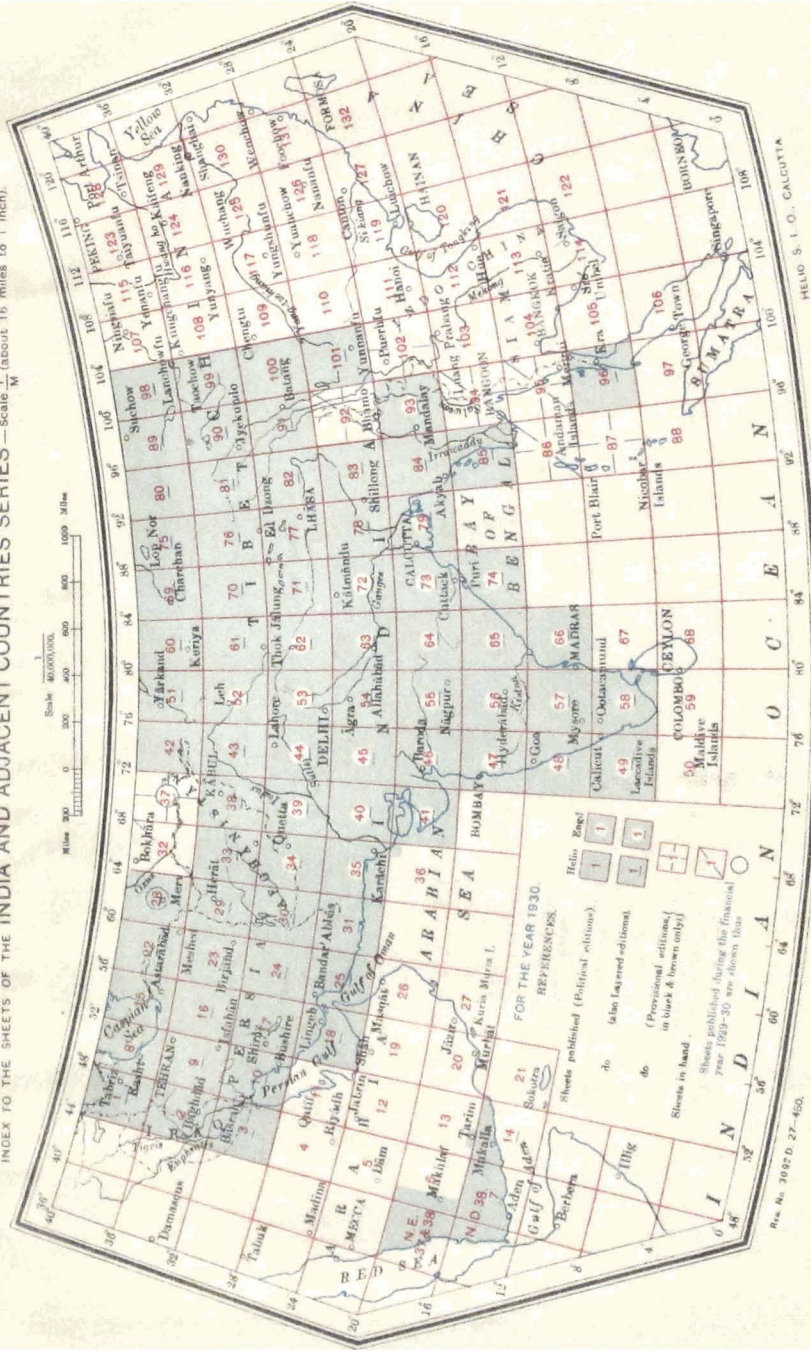
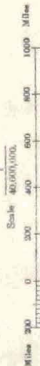
1. Maps published on scales 1-inch and  $\frac{1}{2}$ -inch to 1 mile ... *Frontispiece.*
2. The Southern Asia Series, scale  $1/32$ M (about 82 miles to 1 inch) ... .. At End.
3. The India and Adjacent Countries Series, scale  $1/16$ M (about 16 miles to 1 inch) ... .. " "
4. Carte Internationale du Monde on the scale of  $1/16$ M ... .. " "
5. Maps published on scales  $\frac{1}{4}$ -inch and  $\frac{1}{8}$ -inch to 1 mile ... .. " "







INDEX TO THE SHEETS OF THE INDIA AND ADJACENT COUNTRIES SERIES — Scale  $\frac{1}{M}$  (about 16 miles to 1 inch).



FOR THE YEAR 1930.  
REFERENCES.

1. Sheets published (Political editions).  
do. do. also latest editions.  
do. do. (Provisional editions, in blue & brown only).  
do. do. Sheets in hand.

2. Sheets published during the fractional year 1929-30 are shown thus

HELUO S. I. O. CALCUTTA

Rev. No. 3087D. 27-150.









### MAPS PUBLISHED

on scales of  $\frac{1}{4}$  inch and  $\frac{1}{8}$  inch to one mile.

**SURVEY CIRCLES**  
(Boundaries shown in blue)  
Director Frontier Circle, Simla  
Central - Bangalore  
Southern - Shillong  
Eastern - Maymyo  
Burma - Maymyo  
Also Director Geodetic Branch, Dehra Dun  
Map Publication, Calcutta  
Assistant Surveyor General, Calcutta

**SYSTEM OF NUMBERING SHEETS.**  
THE  $\frac{1}{4}$  SERIES forms the basis of numbering for sheets on all scales. It consists of sheets 4" x 4" on the scale of 1:1,000,000, whose numbers are shown on the Index thus—  
QUARTER-INCH SHEETS—Each  $\frac{1}{4}$  sheet is divided into 16 sheets of scale quarter-inch to one mile, lettered A-F as shown on the Index. The name of each quarter-inch sheet is therefore written thus 55, K

**PUBLICATIONS** up to 31st March 1930.  
on QUARTER-INCH and  $\frac{1}{8}$  INCH scales

**REFERENCES.**  
SCALE  $\frac{1}{4}$  INCH TO ONE MILE  
In modern style      
Data also available in layered editions.  
Preliminary editions, in modern style, but based partly on old or sketchy materials.  
Further surveys expected.  
Provisional, in black only, old and inferior

**SCALE  $\frac{1}{8}$  INCH TO ONE MILE**  
**NEW MAPS** (including revised editions)  
Published during the financial year 1929-30.  $\frac{1}{4}$  inch C,  $\frac{1}{8}$  inch D  
In hand, to be published by the end of 1930. do. C, do. D

Miles 100 0 100 200 300 400 500 600 700 800 900 Miles  
Scale 1:12,000,000  
Published under the orders of Brigadier R. H. Thomas, D.S.O., Surveyor General of India, 1929.  
E. of Greenwich  
No. 1888, D 25-450

