

REPORT OF
A MAGNETIC SURVEY OF
SOUTH AFRICA

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J. C. Beattie
Frontmatter
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REPORT OF
A MAGNETIC SURVEY OF
SOUTH AFRICA

BY

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PREFACE

THE magnetic survey of South Africa—the results of which are given in the following pages—was carried out with the aid of grants from the Royal Society, the British Association for the Advancement of Science, and the governments of Cape Colony, the Transvaal, the Orange River Colony, Natal, and Rhodesia.

The observations were made by Professor J. T. Morrison and the writer, with assistance at one time and another from Mr S. S. Hough, Professor A. Brown, Professor L. Crawford and Mr V. A. Löwinger. The period over which the observational work extends is from 1898 to 1906. The greatest number of stations—about 300—was occupied in 1903 when the writer had leave of absence for a year. The other stations were occupied during the college vacations of the different years.

The reduction of the astronomical observations was carried out by Mr Löwinger and the writer, with the assistance of several computers of the Royal Observatory at the Cape. The reductions of the magnetic observations were made mainly by the writer, with the assistance of Professor Morrison, Miss Lucy Stapleton, Mr F. D. Hugo and Mr C. Craggs.

The calculations involved in the discussion of the results were carried out by the writer, with the assistance of his wife.

The region surveyed extends from L'Agulhas on the south to the Victoria Falls on the north, and from Saldanha Bay on the west to Beira on the east. More than 400 stations have been occupied, and at a number of these—about twenty—the observations have been repeated at intervals in order to obtain data for the secular variations of the different elements.

It gives the writer great pleasure to be able to thank those—and they are many—who have directly and indirectly helped in the carrying out of the survey. In particular, thanks are due to Viscount Milner, Sir Walter Hely Hutchinson, Sir David

Gill, Hon. J. W. Sauer, Hon. T. W. Smartt, Mr L. Mansergh and Mr A. Bell of the Public Works Department of Cape Colony, the railway managers and the postmasters-general in the different South African Colonies, the surveyors-general in the Cape Colony, in the Transvaal, and in Natal, and His Majesty's Astronomer at the Cape.

Thanks are also due to Professor Brown for reading over the manuscript and for valuable suggestions with regard to the arrangement of the matter of the Report.

The writer also wishes specially to thank Dr Chree for the sympathetic communications he has had from him as representing the Committee of the Royal Society to whom the publication of the work was referred, for many valuable suggestions, and for his kindness in undertaking the final revision in England of the proof-sheets.

The field books used in the survey and the reduction sheets for each station are in the Physical Laboratory of the South African College, and can be consulted there.

J. C. BEATTIE.

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 SOUTH AFRICAN COLLEGE,
 CAPE TOWN.

May, 1908.

[The Secretaries of the Royal Society desire to record their thanks to Dr C. Chree, F.R.S., whose careful and laborious revision, freely given, has contributed very substantially to the accurate printing of the text and particularly of the maps, in England, in the absence of the Author.

They desire also to express their acknowledgments to the officials of the Cambridge University Press, for the pains which they expended on the efficient execution of the work.]

J. L.

April, 1909.

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of the Cape of Good Hope.

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CORRIGENDA

(Pages in Italics refer to the Appendices.)

PAGE

- 11, line 2. Plate I should be Chart I.
 25, line 13. Klipplast should be Klipplaat.
 50. Latitude of Cotswold Hotel should be $30^{\circ} 42'7$, not $32^{\circ} 42'7$.
 55. Name of Station 81 should be Deelfontein Farm, not Deelfontein.
 „ „ „ 82 „ Deelfontein, not Deelfontein Farm.
 67. Latitude of Gamtoos River Bridge should be $33^{\circ} 55'2$, not $33^{\circ} 15'2$.
 69. Declination at Glenallen should be $47^{\circ} 59'5$, not $47^{\circ} 56'5$.
 72. Latitude of Grange should be $29^{\circ} 37'9$, not $29^{\circ} 7'9$.
 75. Longitude of Groenplaats should be $28^{\circ} 33'8$, not $28^{\circ} 3'8$.
 „ „ Grootfontein should be $21^{\circ} 15'0$, not $19^{\circ} 15'0$.
 96. Declination at Kenhardt should be $26^{\circ} 22'4$, not $26^{\circ} 15'4$.
 101. The description under Map 10 applies to 10 (a) only; in 10 (b) Dip is plotted against longitude.
 133. Movene should be numbered 224A, not 223A.
 134. M'Phateles should be M'Phatele's.
 147. Pivaans should be Pivaan's.
 189. Number of Station Twelfelhoek should be 333, not 331.
 „ „ „ Tweepoort „ 331 „ 332.
 190. „ „ Twee Rivieren „ 332 „ 333.
 212. Latitude of Wolfefontein should be $33^{\circ} 19'0$, not $23^{\circ} 19'0$.
 219. Longitude of Station 390 should be $29^{\circ} 44'8$, not $29^{\circ} 4'8$.

The positions given for Kenilworth and Beaconsfield, near Kimberley, do not agree with those indicated in Chart I.