

ABSTRACT OF SCIENTIFIC REPORT

British Antarctic Survey Scientific Report No. 110

Reconnaissance gravity and aeromagnetic surveys of the Antarctic Peninsula by

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1985. 54 pp. ISBN 0 85665 113 3

Measurements made between 1959 and 1984 by the British Antarctic Survey at gravity stations on the Antarctic Peninsula have been recomputed within a stronger base-station framework. The results are tabulated as absolute, Bouguer and free-air anomalies and are also presented in contoured form. A 1:1 500 000 Bouguer anomaly map reveals several anomalous trends, the most significant of which is an axial minimum attributed to crustal thickening asymmetrically distributed beneath the geographical axis of the peninsula. Automated direct modelling of selected gravity profiles suggests that crustal thicknesses exceed 30 km. Isolated positive gravity anomalies off the west coast of Graham Land could represent part of a more extensive anomalous zone trending south at least to the Batterbee Mountains in Palmer Land; they may be associated with the west coast magnetic anomaly.

Over 36 000 line kilometres of aeromagnetic profiles have been recovered and processed since 1973. The data are presented as a contoured map together with representative observed profiles. Several distinct magnetic provinces are identified, including a west coast anomaly traceable for over 1300 km and trending nearly parallel to the arcuate peninsula. The tectonic significance of the anomaly is conjectural, but it may represent a composite igneous intrusive body related to known Mesozoic-Cenozoic subduction.

The active magnetic signature of the west coast anomaly contrasts with the quieter magnetic regime of the Larsen Ice Shelf, where sedimentary thicknesses in excess of 10 km are estimated. Over Alexander Island, low magnetic gradients reflect underlying sediments, whilst superimposed local magnetic anomalies correspond to dispersed igneous bodies. Certain gravity anomalies over the island conform with block faulting and, in the northern half, with crustal thickening. Both gravity and magnetic anomalies over George VI Sound are consistent with those of a major graben structure.

Along the Black Coast of south-east Palmer Land, a pocket of short-wavelength, high-amplitude magnetic anomalies suggests the presence of near-surface bodies rich in magnetite.

BAS OCCASIONAL PUBLICATIONS

The following publications are available from the Distribution Centre (see inside front cover for address).

Geomagnetic measurements at Argentine Islands 1957-82 by P. A. Salino

1985. 80 pp. ISBN 0 85665 114 1. £12.00 post free.

This report describes the operation of the magnetic observatory on the Argentine Islands from its opening in 1957 to the end of 1982. Full details of the site, buildings, instruments, and their operation are given.

A 'normal' and an insensitive La Cour magnetograph were installed in 1955 and repositioned in 1971 and 1970 respectively. The QHM has been used throughout for

measuring the horizontal component, a 'Quartz Declinometer' replaced the 'Kew pattern' magnetometer for measuring declination in 1982 and the PPM replaced the BMZ for calculating the vertical component in 1979.

The method of computing mean hourly values is described and the accuracy and reliability of the data are discussed. Tables are given listing the monthly and annual means, and listing the mean diurnal variation for each month. These tables are for the H , D and Z components and list values for all days, 'quiet days' and 'disturbed days'.

Measurements of solar and terrestrial radiation at King Edward Point, South Georgia, 1973-81 by J. D. Shanklin
1985. 20 pp. ISBN 0 85665 110 9. £3.50 post free.

Solar and terrestrial radiation measurements made at King Edward Point, South Georgia, in the period 1973-81 are presented. Details of the instrumentation used, the calibration of the sensors, the characteristics of the measurement sites and the data reduction procedures are given. Summary tables are presented giving sums, means and extremes of the measured radiation components over ten-day, monthly and annual periods.

Geomagnetic measurements at South Georgia 1975-1982 by D. A. Simmons
1985. 170 pp. ISBN 0 85665 111 7. £17.50 post free.

The results are given of the geomagnetic measurements made at South Georgia from January 1975 to March 1982. Full details of the site, the variometers and the absolute instruments are included.

The installation of the La Cour magnetograph and the fluxgate magnetometer are described together with the calibration and use of the absolute instruments. The method of computing mean hourly values is described and the accuracy and reliability of the data are discussed.

It is concluded that, apart from a possible discontinuity of approximately 5 nT in Z between December 1977 and January 1978, the mean values of H and Z are correct to ± 6 nT throughout the time.

Summary tables of monthly and annual means are provided for the three components H , D and Z as well as tables of hourly means for the whole period. Tables of the K indices are also provided.