GEOPHYSICS

Geomagnetic Micropulsations

A DETAILED analysis of geomagnetic micropulsations has been carried out on records obtained at Albert Head between November 29, 1956, and February 16, 1957. Albert Head (approximately 48° 23′ N., 123° 29′ W.) is situated by the sea near Victoria, Vancouver Island, British Columbia. The records were obtained from three mutually perpendicular air-core induction coils, each 20 ft. in diameter, mounted in a rigid wooden octahedron[1]. The records were analysed by visual inspection : more than 300 fluctuations were identified with periods ranging from 15 to 400 sec. Their amplitudes were read and reduced by simple computation to components X (north), Y (east) and Z (vertically downwards). Plots were made of these three components against the period T of the oscillations, but yielded little information. There was a tremendous scatter in the points, and it was impossible to draw any mean curve through the data. The only conclusion that could be drawn was that, in general, the amplitude appeared to increase with the period.

The same data were then taken and the amplitude of every fluctuation divided by the K_p index at the time the observation was made. Plots were drawn of X/K_p, Y/K_p and Z/K_p against T. There was a very considerable reduction in the scatter, which was further reduced if local K indices (instead of K_p) were used. A least-squares analysis gave extremely interesting results. The graphs of both X/K_p (Fig. 1) and Y/K_p (Fig. 2) consist of parts of two straight lines—the change of slope occurring at a period of about 2 min. An investigation is now being made to see whether these may represent two different kinds of magnetohydrodynamic waves—poloidal and torsional oscillations. The graph of Z/K_p (Fig. 3) is almost linear. It would be interesting if similar calculations

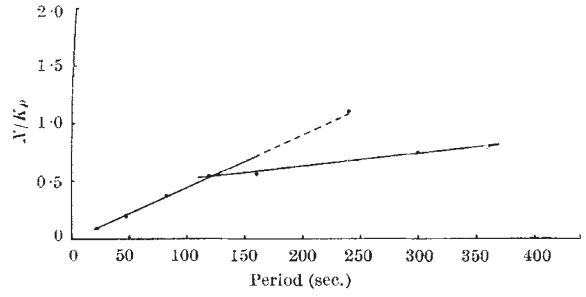

Fig. 1. X/K_p plotted against period (Albert Head, November 1956–February 1957)

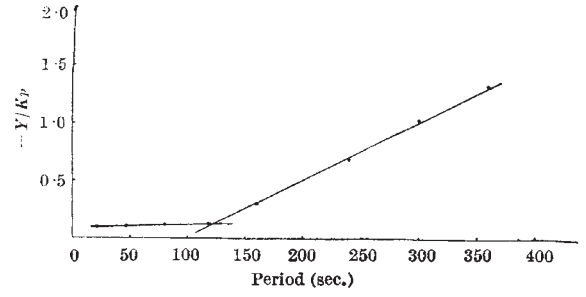

Fig. 2. $-Y/K_p$ plotted against period (Albert Head, November 1956–February 1957)

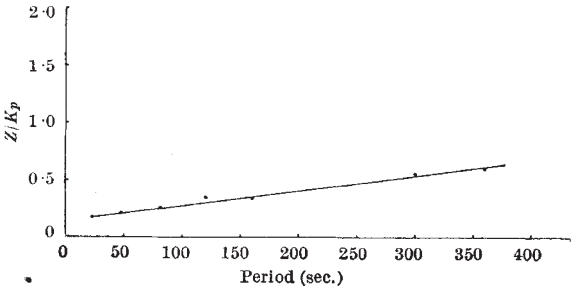

Fig. 3. Z/K_p plotted against period (Albert Head, November 1956–February 1957)

were made at other stations and at different periods of the year. The above method of analysing the data may not be the best, but was continued since the early results were encouraging. The smallest K_p value was 1·0. A detailed account of this study is being prepared.

This work is supported by the Defence Research Board of Canada and was carried out last summer at the Pacific Naval Laboratory, Esquimalt, British Columbia.

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Dec. 13.

[1] Duffus, H. J., and Shand, J. A., *Canad. J. Phys.*, **36**, 508 (1958).

Storm-Time Increase of Cosmic-Ray Intensity

DURING the period of the International Geophysical Year (July 1957–February 1958) there were several occasions in which the intensity of cosmic rays increased by a few per cent. Two typical events, which occurred on September 13, 1957, and February 11, 1958, respectively, will be described here.

Since the change in intensity is complicated by the diurnal variation, the world-wide type of decrease and so on, the increases observed at any particular position may be depressed or exaggerated. In order to study the characteristics of an increase more clearly, Fig. 1 was prepared. The four curves represent the variation in intensity averaged for two or three stations distributed symmetrically in geographical longitude (Table 1), so that any diurnal variations may be approximately smoothed out[1]. From Fig. 1 it is seen that the cosmic-ray intensities increased

Table 1. STATIONS USED IN COMPILATION OF DATA FOR FIG. 1

Symbol	Component	Station	Altitude (m.)	Geomagnetic latitude	Geographical longitude
I_1	Neutron	Norikura	2,770	25·6° N.	137·6° E.
	,,	Zugspitze	2,960	48·2° N.	11·0° E.
	,,	Climax	3,400	48·2° N.	106·2° W.
I_2	,,	Yakutsk	S.L.	51·0° N.	129·6° E.
	,,	Göttingen	273	52·3° N.	9·9° E.
	,,	Chicago	S.L.	52·6° N.	87·7° W.
I_3	,,	Mawson	S.L.	73·1° S.	62·9° E.
	,,	Resolute	S.L.	82·9° N.	94·9° W.
I_4	Meson (ion chamber)	Yakutsk	S.L.	51·0° N.	129·6° E.
	,,	Moscow	S.L.	50·8° N.	37·3° E.
	,,	Fredericksburg	S.L.	50·0° N.	76·7° W.
H	Geomagnetic horizontal	Kakioka	S.L.	26·0° N.	140·2° E.
K_p	K_p index				

S.L., sea-level