

Geomagnetic Secular Variation at the South African Antarctic Base, Sanae

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The purpose of this communication is to present in tabular and graphical form the mean annual values of the geomagnetic elements as observed by successive South African Antarctic Expeditions during their occupation of the Antarctic bases Norway Station (1960-1961) and Sanae (1962-1969).

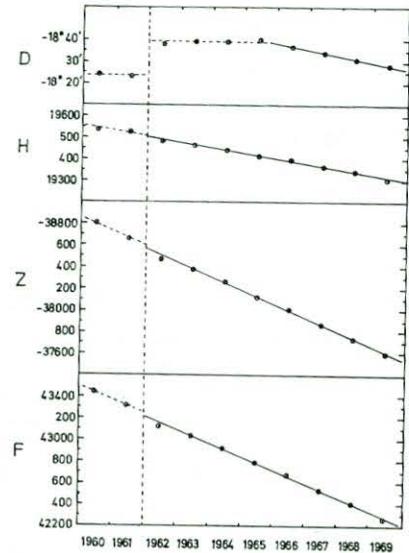
The handing over of Norway Station ($70^{\circ} 30'S$, $2^{\circ} 32'W$) to the first South African Antarctic Expedition at the beginning of 1960, and the erection of the new South African base, Sanae ($70^{\circ}18'S$, $2^{\circ} 21'W$), are described elsewhere in this issue (Kühn, loc. cit.).

Attempts made by successive observers to obtain a direct tie-in between the 'absolute' magnetic stations at Norway Station and Sanae gave disappointingly inconsistent results. However, the differences, if any, between the absolute values at the two stations can be read off with reasonable accuracy from the accompanying graphs. Owing to the various sources of error mentioned in the relevant annual data-bulletins* the quality of the data is hardly comparable to that of standard magnetic observatories operating in low and middle latitudes. The fit of the points on the graphs is nevertheless considerably better than had been anticipated.

The annual values listed below have been corrected for all known errata. These include an error of $10'$ in the azimuth value used for the reduction of the D base line values for the period January 1963 to April 1964.

Interesting features of the graphs are the almost negligible differences in the intensity elements at Norway Station and Sanae at the time of the change-over in 1962, and the downward trend in the D curve since 1965. The mean secular variation in D during the period 1965-1969 was $3'$ per annum easterly which is of about the same order as but of opposite sign to that shown on the regional and world isogonic charts immediately available to me. As Sanae is situated on a moving ice shelf, the 'anomalous' secular variation could be due to changes in the position of the base relative to the underlying geologic structure. The ob-

vious way to settle this question would be to determine (a) the gradients of the magnetic elements in the vicinity of the base and (b) the direction and rate of movement of the ice.



Magnetic secular variation at Sanae. Intensities in gammas.

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References

Kühn, G. J. The geomagnetism and aurora programme in Antarctica. *S.A. Journal of Ant. Research*, 1, 1971.

Mean annual values of the magnetic elements

(Intensities in gamma units)

Station	Year	D	H	Z	I	F
Norway Station	1960	$-18^{\circ}24'$	19552	-38803	$-63^{\circ}15'$	43451
	1961	$-18^{\circ}23'$	19524	-38665	$-63^{\circ}13'$	43315
Sanae	1962†	$-18^{\circ}38'$	19482	-38468	$-63^{\circ}08'$	43120
	1963	$-18^{\circ}39'$	19464	-38378	$-63^{\circ}06'$	43032
	1964	$-18^{\circ}39'$	19440	-38265	$-63^{\circ}04'$	42920
	1965	$-18^{\circ}40'$	19413	-38125	$-63^{\circ}01'$	42783
	1966	$-18^{\circ}37'$	19398	-38011	$-62^{\circ}58'$	42677
	1967	$-18^{\circ}34'$	19368	-37870	$-62^{\circ}55'$	42535
	1968	$-18^{\circ}31'$	19345	-37741	$-62^{\circ}52'$	42410
1969	$-18^{\circ}28'$	19309	-37598	$-62^{\circ}49'$	42266	

†July to December only.

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