Palaeomagnetism of the Isachsen Diabasic Rocks

In a previous article by two of us[1] it was suggested that a belt of diabasic rocks south of Isachsen in the Canadian Arctic Archipelago appeared to be of Cretaceous age on the basis of its palaeomagnetism. On the other hand, whole rock potassium/argon age determinations on two of the samples studied (1–*A* and 10–*B*) indicated a Permian age (241 and 249 m.y.), in conflict with the palaeomagnetic data. No reasonable explanation for this incompatibility could be advanced at the time and, since then, one of us (R. K. W.) has re-determined the age of one of the samples (10–*B*), using a mass spectrometer with higher sensitivity than was used in the original determinations. Another sample (9–*B*) was sent to the Isotope Branch laboratories, U.S. Geological Survey, and a third one (9–*A*) was split and one half of it was sent to Dr. N. J. Snelling at the University of Oxford, while the other half was dated in the laboratories of the Geological Survey of Canada with the new high-sensitivity instrument. The ages obtained in these four whole rock determinations are listed in Table 1.

Table 1

Sample	Laboratory	% K	% ^{40}Ar (radiogenic)	^{40}Ar/^{40}K	Age* (m.y.)
10–*B*	Geological Survey of Canada	0·93	39	0·00656	109
9–*A*	,, ,,	0·96	40	0·00660	110
9–*A*	Oxford (ref. 2)	0·94	39	0·00618	103
9–*B*	U.S. Geological Survey (ref. 3)	0·75	66	0·00612	102

* Constants: $\lambda\beta = 4{\cdot}72 \times 10^{-10}$ y^{-1}; $\lambda\varepsilon = 0{\cdot}585 \times 10^{-10}$ y^{-1}; ^{40}K = 0·0119 atomic per cent.

It is apparent from the consistency of these determinations that the rocks dealt with in the original paper[1] are of Lower Cretaceous age and that the pole position derived from their mean palaeomagnetic direction should be considered as a fairly reliable one for Lower Cretaceous time with respect to the North American Continent.

We thank Dr. N. J. Snelling of the University of Oxford and Dr. S. S. Goldich, formerly of the U.S. Geological Survey, for their assistance.

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[1] Larochelle, A., and Black, R. F., *Nature*, **198**, 1260 (1963).
[2] Snelling, N. J. (personal communication).
[3] Goldich, S. S. (personal communication).

MINERALOGY

Interstratified Mineral of Illite and Montmorillonite

A yellowish-grey tuff, about 1 m thick, is distributed over a considerable area of the Sorachi coal field, Hokkaido, Japan[1], as a member of the Noborikawa coal-bearing formation. The tuff contains a small amount of quartz and plant fragments, but is generally homogeneous.

Table 1. X-ray Powder Data of 29 Å Interstratified Mineral (Illite–Montmorillonite)

Air dried *d*(Å)	150° C	300° C	450° C	600° C	750° C	E.G.	G.	NH_4NO_3
29·4	29·4	29·4						
11·9	11·11	10·3	9·94	10·3	10·5	11·9 9·51 7·14	12·8 9·51	11·1
5·07	5·04	5·01	4·95	5·04	5·10	5·13	5·90	5·13 5·01
4·51	4·51		4·48	4·51	4·51 3·36 (m)	4·46 3·34 (m)	4·46 3·34 (m)	4·48 3·36
3·28	3·30	3·35	3·30	3·34				3·28

Values represent the maximum peak positions of reflexions.
(m) means that it may be multiple reflexions of quartz and interstratified mineral.
E.G., treated with ethylene glycol. G., treated with glycerol.

Having dispersed some of the material in water, the minus-two-micron fractions of the tuff were separated by the sedimentation method; Fig. 1 shows its electron micrograph. The X-ray powder patterns and data on the well-oriented specimens are shown in Fig. 2 and Table 1. The specimens were dried in air, heated at 150° C, 300° C, 450° C, 600° C,

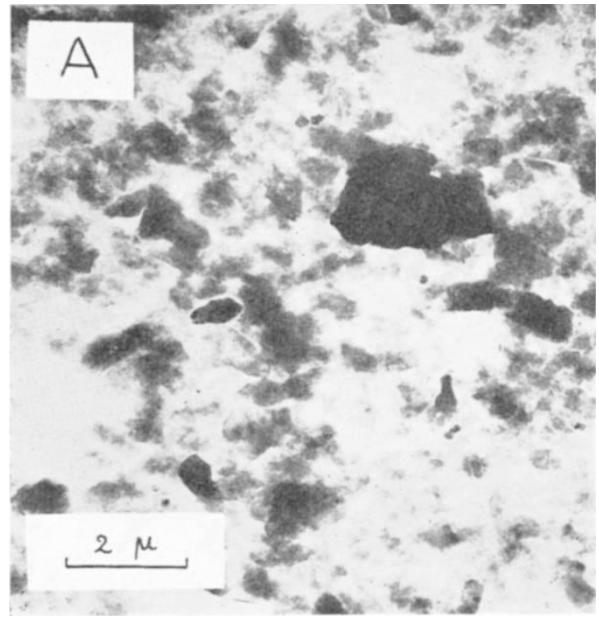

Fig. 1. Electron micrograph of 29 Å interstratified mineral

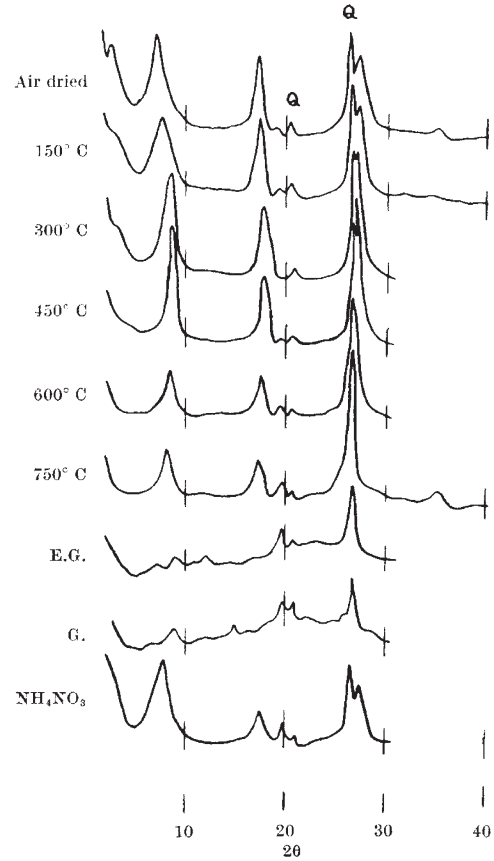

Fig. 2. X-ray powder patterns of the interstratified mineral. Q, reflexions due to quartz; E.G., treated with ethylene glycol; G., treated with glycerol. Operation conditions: Ni filtered copper radiation. 35 kV, 15 m.amp. Scanning speed, 1°/min; scale factor, 16; multiplier, 1; time constant, 4; receiving slit, 0·4 mm