

deposit initiated slumping and folding of the plastic sheet into its present form; the fissures correspond to tensional faults of anticlinal folds. Afterwards dehydration converted the original material into the existing rigid and impervious pan, thus inhibiting further development.

The evidence indicates that if rapidly accumulated, ferric oxide deposits may pass through a plastic phase before induration. The process may account for concretionary and vesicular structures of certain lateritic horizons, and is being investigated for a future report.

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Dating of some Minor Intrusions of Ayrshire

AMONG the alkaline igneous rocks of Ayrshire are two groups of minor intrusions the age and genetic relations of which have aroused considerable interest in the past. The 'kylites' and 'crinanites' of Tyrrell¹ were originally classified together and were thought to be differentiates of the same magma, but later work by the Geological Survey (MacGregor²) has suggested that this may not be the case.

Kylites are olivine-rich theralites and essexites which frequently contain polysomatic clusters of purplish augite and only small quantities of analcite. The 'crinanites' are characterized by poikilophitic texture, an abundance of analcite, the presence of coarse, leucocratic segregation-veins (analcite-syenite of Tyrrell), and the frequent occurrence of accessory hornblende which is very rare in the kylites.

The Permian age of the kylites is fairly well established, as the majority of them are intruded into Coal Measures and two sills of the group are pierced by Permian volcanic necks. Fragments of kylitic rocks have been found in Permian necks, and the group closely resembles, both chemically and mineralogically, the Permian lavas of the Mauchline Basin.

Field evidence regarding the age of the 'crinanites' is not so conclusive, but similar intrusions on Arran are regarded as Tertiary. Mining evidence has suggested that a sill at Prestwick may be pierced by a small volcanic neck similar in type to the Permian necks around Dalmellington, but at Mauchline, a member of the group cuts sandstones above the Mauchline lavas. Crinanitic dykes trending north-west are thought to be connected with the Tertiary centres of Mull and Arran.

Since both the Permian and Tertiary directions of magnetization are well known in Britain (Creer *et al.*³), more than forty specimens, including typical representatives of both petrological groups, were collected, and a palaeomagnetic study of the directions of permanent magnetism was made using a simple astatic magnetometer. The dual classification based on petrology was confirmed. The Permian age of

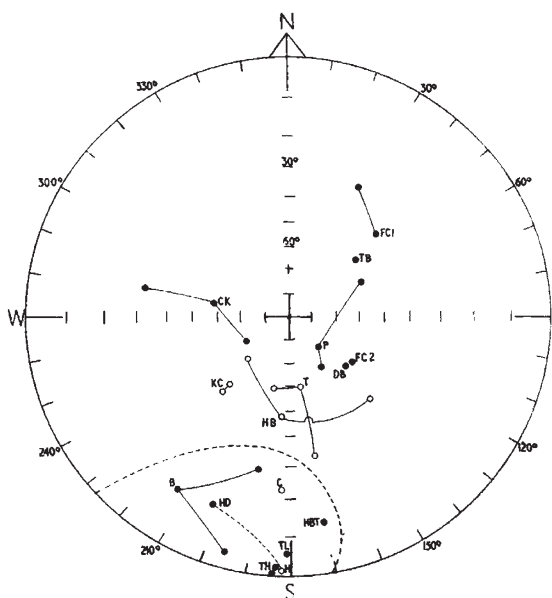


Fig. 1. Stereogram showing directions of magnetization of Ayrshire intrusions:
Specimen localities. *Kylitic group*: B, Benbeoch; HD, Hallyards Qy.; H, Hillhouse Qy.; TH, Tappet Hill; C, Crawfordjohn (essexite).
Crinanitic group: FC1 and FC2, Fisherton Cottage (dykes); DB, Dippol Burn; TB, Traboch Burn; KC, King's Cross Point (Arran); T, Troon; P, Prestwick; HB, Howford Bridge.
Unclassified: TL, Tarbolton Station (Mauchline lavas); CK, Carskeoch; HBT, Howford Bridge (tuff).
The dotted line encloses Permian points. ●, North-seeking pole pointing downwards; ○, north-seeking pole pointing upwards; +, theoretical dipole

the kylites was verified (the mean directions of magnetization calculated using Fisher's⁴ statistics gave a declination of 181° and an inclination of + 7° compared with the Du Bois unpublished result of 180° and - 4° for the Mauchline lavas) and the 'crinanites' gave a direction of magnetization consistent with a Tertiary age. Evidence of reversals suggests intrusion at different times within the Tertiary, although the time interval may not be great.

Some of the samples were partially stable magnetically, particularly those from the Craigs of Kyle (kylitic group), which initially gave directions suggestive of a Tertiary age, but on partial demagnetization (which removed the isothermal remanent magnetization) gave directions consistent with a Permian age. Other specimens subjected to the same treatment were unaffected and therefore considered stable.

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