CORRESPONDENCE

CROSS-FOLDS

SIR,—In a recent paper on " Fold Structures in the Dalradian Rocks of Knapdale, Argyllshire " (Roberts, 1959), I stated that King and Rast (1956) attributed the development of cross-folds in the Dalradian rocks of south-east Cowal to the action of a subsidiary axis of shortening. This was incorrect. They consider that " the cross-folds correspond to the general direction of elongation or transport, whereas the Caledonoid folds are more especially related to an axis of rotation " (p. 195). The relevant section of my own paper (p. 221) should have read as follows :—" These authors recognize the existence of one dominant Caledonoid axis of folding while folds of the second set are considered to be cross-folds. Weiss (1958), however, considers that the axial planes of cross-folds, typically developed by a subsidiary axis of shortening, should be perpendicular to the axial planes of the main folds."

I deeply regret this unfortunate mistake, and should like to apologize to the two authors concerned.

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CULM MEASURES STRATIGRAPHY

SIR,—A close examination of Dr. Simpson's (1959) paper on "Culm Stratigraphy . . ." shows that it contains no indisputable facts to support the idea of a major unconformity within the Carboniferous strata of Devon and Cornwall. Moreover, the main points of his paper—(1) the apparent absence of cleavage in his Ugbrooke Group, (2) the post-orogenic and probable post-granite age of this group—were clearly stated by Somervail (1898).

The present balance of evidence is definitely against this coarser-grained Ugbrooke Group being post-orogenic in age. Detailed field work shows that both to the east and west of Dartmoor this group of sediments possesses a fold pattern similar to that seen in the other Carboniferous rocks. Dr. Simpson has been misled in that he has evidently only visited exposures in the relatively long flat-lying fold limbs where the strata are the right way up and virtually undeformed. This could have been avoided by a careful reading of the excellent detailed descriptions in the relevant Geological Survey memoirs. These make it clear that the Ugbrooke Group must be fully involved in the orogenic movements (e.g. Reid and others, 1911, pp. 42–47).

The most convincing field evidence so far available of the orogenic and pre-granite character of this group is to be seen at Tavistock (Dearman and Butcher, 1959, pp. 61–62 and 66–67). Here the strata, locally referred to as the Whitchurch Down Greywacke Group, are mostly inverted and tightly folded. The outcrop can be traced eastwards as a narrow band until it is cut off, and the sediments contact metamorphosed, by the Dartmoor granite (Fig. 14).

Certainly the presence or absence of cleavage cannot be relied upon in dating the strata; only fossils can be used, as these provide indisputable facts. Fortunately the Culm Measures are slowly yielding determinable goniatites