

We wish to thank the Mountsorrel Granite Company for allowing us to visit their quarry and collect samples. We are indebted to the Department of Scientific and Industrial Research for financing the work and to the Royal Dutch Shell Oil Company for a studentship to one of us (J. A. M.).

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#### REFERENCE

WATTS, W. W. 1947. *Geology of the ancient rocks of Charnwood Forest, Leicestershire, Leicester.*

#### DISCOVERY OF COPPER MINERALS IN LEWISIAN GNEISS

Sir,—The presence of traces of copper ore has not, so far as the writers are aware, been reported in the Lewisian gneiss of north-west Scotland. An occurrence of copper-bearing minerals was found by us recently in the gneiss about one quarter of a mile south-east of the Bay of Clachtoll, near Stoer, Sutherland (Grid reference : 041267). The minerals form patches in the gneiss some two square inches in diameter over an area of about one square yard. Near the mineral locality there is a talc, anthophyllite dyke with which the occurrence may or may not be associated. Intensive search in the neighbourhood has failed to locate any other occurrence of copper minerals in the Lewisian gneiss.

The presence of copper minerals occurring in the Torridonian beds of this region was reported by Sir Lewis Fermor in the *Geological Magazine (Geol. Mag. lxxxviii, 1951, pp. 215–218)*, who gave their locus "on the promontory separating the Bay of Clachtoll on the south from the Bay of Stoer on the north". It is not suggested, however, that there is necessarily any relationship between these occurrences.

Although we failed to find further traces of copper minerals in the Clachtoll area, minute quantities were found by Mr. A. K. MacLeod of Inverkirkaig, in the gneissic rocks of a quarry alongside the road bordering Loch an Eisg-brachaidh, about a mile south of Loch Kirkaig (Grid reference : 073178). Unfortunately, soon after these specimens were found, the quarry suffered a severe rock-fall, rendering further investigation both unproductive and dangerous. Smears of copper compounds were, however, detected on rock faces in another small quarry at the top of the hill in which the occurrence of harmotome crystals has been recorded by Waterston (*Miner. Mag.*, xxx, 1953, pp. 136–138).

The minerals at Clachtoll consist principally of *brochantite* [ $\text{Cu}_4(\text{OH})_6\text{SO}_4$ ], accompanied by small amounts of quartz, iron oxide and chlorite; but *malachite*, *chalcocite*, *covellite* and *bornite* were also found in associated specimens. The samples found at Eisgbrachaidh consist mainly of *malachite* accompanied by *haematite*.

The writers are indebted for these identifications to Dr. Diane C. Knill and Mr. B. R. Young of the Geological Survey, London; and to Mr. P. McL. D. Duff of the Grant Institute of Geology, Edinburgh, whose help is greatly appreciated.

Rock specimens containing these cupriferous deposits have been presented to the Geological Museum, London (Nos. M.1. 30217/30371/30373); and to the Geological Department of the Royal Scottish Museum, Edinburgh (No. 1959. 5).

ALEX J. BOYD AND JAMES M. CRICHTON.

INVERKIRKAIG,  
NR. LOCHINVER,  
VIA LAIRG,  
SUTHERLAND.  
15th August, 1960.