grains. Referring to the layered structure, Wager and Brown note " that it will be possible to map individual sheets over wide areas much as a normal series of sedimentary rocks may be mapped ". Later they add : " we are satisfied that the fundamental characteristic of the Skaergaard intrusion, namely accumulation of material from the bottom upwards, is responsible also for the sheet structure of the Rhum rocks." This tacitly assumes that the stratigraphical sequence of the layers is identical with their time sequence, an assumption that cannot be made without the support of evidence based on a thorough investigation of all the contacts concerned. The authors illustrate their interpretation by a photograph of a vertical rock face (Plate VII). This photograph cannot be said to demonstrate the structure described at all clearly as it is the white material (plagioclase) which appears to branch more conspicuously than the grey (olivine). In my own experience, based on field observations and examination of many thin sections, I have found the branching material " growing up " from the base of each layer to be vein-like aggregates of plagioclase, not single crystals of olivine ; the olivine individuals are characteristically nearly equidimensional and subhedral. Throughout the harrisite the plexus of plagioclase veinlets is more resistant to weathering than the olivine and stands out on weathered surfaces in much the same way as granophyric net-veins in basic rocks and with a similar type of pattern. If there are coral-like olivine crystals in the harrisite, such as Wager and Brown describe, they must be quite exceptional ; so far, I have not seen any, though certain granular aggregates of olivine do locally simulate branching forms. Moreover, if Wager and Brown's postulated conditions had obtained, one would have expected an increasing tendency to idiomorphism in the olivines towards the upper part of each layer. In all the examples I have studied I have found no such tendency ; the olivines are everywhere subhedral.

It should be pointed out that Harker long ago noticed the " coralline " structure of some of the layers. In the " Small Isles " *Memoir*, 1908, p. 75, he wrote : " Many of the rock-faces are pitted or even irregularly honeycombed, sometimes with cavities of rudely branching form. The salient parts often have forms resembling ' concretionary growths in impure calcareous or calcareo-argillaceous sediments, or, when more elaborately developed, recall the shapes of sponges and corals. More remarkable structures arise when effects of this kind have been superposed upon a well-marked fine banding. Here we find structures comparable with a certain type from the Magnesian Limestone of Durham, in which the concretionary growth has not obliterated the original lamination." Harker's highly significant analogy serves to emphasize the extreme difficulty of the problem. In the " coralline " layers of the Magnesian Limestone we know what the parental material was and yet have no convincing explanation to account for the structure. In the case of the layered peridotites of Rhum we do not know as yet what the parental material may have been, or even if there was any, other than a hypothetical magma. It is therefore not surprising that there is still no satisfactory explanation for these enigmatic structures.

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16th June, 1951.

WALL GRANGE BRICKYARD, STAFFS.

SIR,—Until recently there has been no definite proof of the age of the grit which caps the brick-pit at Wall Grange (2½-in. O.S. map, Sheet 33/95—963534), near Leek, Staffordshire. Walcot Gibson, in *The Geology of the North Staffordshire Coalfields* (1905, p. 30), suggested that it was First Grit and added that no goniatites or other marine organisms had been recorded in the underlying shales. The Survey Memoir on the *Geology of the Country around Stoke-on-Trent* (1925, p. 14) states that " grey, sandy, and marly shales lie directly beneath the First Grit and are underlain by dark

laminated shale ". Again, no marine fossils had been detected. The 1-in. geological map (Sheet 123) shows, in the extreme N.E. corner, this Wall Grange grit as Third Grit, with a south-westerly dip of 20°

A few weeks ago I picked up on the floor of the quarry some fossiliferous shale which was kindly examined by Dr. C. J. Stubblefield, who reported that it contained " *Aviculopecten* cf. *losseni* (von Koenen), *Dunbarella* sp., *Anthracoceras* sp., *Gastrioceras* sp. with some fragments showing widely spaced crenulate ornament ". He suspected that the horizon might be that of *G. cumbriense*, though further material would be required for confirmation.

On a later brief visit more shale was picked up, which though badly weathered appeared to contain *Gastrioceras cancellatum* and *Reticuloceras* sp. *Pterinopecten* was also present. Dr. F. Wolverson Cope examined the specimens and confirmed the presence of *Gastrioceras cancellatum* Bisat together with *Reticuloceras reticulatum* mut. *superbilingue* Bisat.

The *cancellatum* band and probably also the *cumbriense* band were inferred to occur somewhere in the quarry. A field meeting of the North Staffordshire Field Club visited the Wall Grange brick-pit on 31st May, and Dr. Cope soon found the *cancellatum* band. Good specimens of *Gastrioceras cancellatum*, *Reticuloceras reticulatum* mut. *superbilingue*, *Pterinopecten* sp., *Orthoceras* sp., fish spines and scales, were obtained from it. The *cumbriense* band was also located some 20 to 30 feet higher, but direct measurement was not possible because of shale scree. The finding *in situ* of these two marine bands, hitherto unrecorded in this brick-pit, proves quite definitely that the capping grit is the Rough Rock, or First Grit.

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9th June, 1951.

RED SEA RIFTING

SIR,—Mr. Arkell wrote a rather emotional and unfriendly article in the *Geological Magazine* of January, 1951, in which he accuses me of not giving credit to British Geologists in Egypt. This article reached me only to-day, due to continuous travelling during the last nine months, and would not have been written by Mr. Arkell if he had followed the international custom of sending me a copy of his complaints before publishing the article.

In my article on the macrostratigraphy of Egypt, which should have appeared in September, 1950, but is still in print in Cairo, I gave a selection of references (altogether 74), including three from Andrew, four from Ball, seven from Beadnell, eight from Hume, two from Moon and Sadek, and many others from British geologists. One of my first sentences in chapter 2 of my article (" Tromp 1950 " referred to by Mr. Arkell) reads : " Since 1897 considerable reconnaissance work has been done by the Geological Survey of Egypt, in particular by the geologists Ball (bibl. nos. 17–20), Barron (bibl. nos. 21–3), Beadnell (bibl. nos. 25–31), Hume (bibl. nos. 48–9), Little (bibl. nos. 51–3), Lucas, Madgwick (bibl. nos. 45–7), Moon (bibl. nos. 45–7), Sadek (bibl. nos. 54, 55, and 55), and others. Local studies were made by Blanckenhorn, Zittel, etc., etc."

A little further : " Up to 1935 the best compilation of the geology of Egypt was written by W. T. Hume and his collaborators, which was published in four magistral volumes, incorporating an incredible amount of interesting facts on the geology of Egypt."

Still Mr. Arkell, who apparently did not try to contact me first, claims that I did not give sufficient credit to British geologists in Egypt.

Much of the geology of Egypt has been changed, however, during the last ten years, as a result of the work of the oil companies. Mr. Arkell will be convinced as soon as he receives a copy of my article. " The astonishing second sentence of my opening paragraph " (as Mr. Arkell calls it), refers to