CORRESPONDENCE

MAGNETOMETRIC MAPPING FOR HAEMATITE IN SOUTH WALES

SIR,—C. R. K. Blundell's paper on magnetometric mapping for haematite in South Wales (*Geol. Mag.*, xc, 57–64) is to be welcomed, but his interpretation of two of the anomalous areas is erroneous.

He explains the residual Low anomaly A1 (Text-fig. 3) as part of the field due to the main Llanharry ore-body. His iso-magnetic contours are evidently not shown in full, but those depicted in the area A1 are too closely spaced to be connected with the anomalies at A. If a profile of anomalies is drawn across A and A1 it is easily seen that the A1 Low must be due to a separate body of little depth, probably not connected at all with the main body of haematite at A.

The same is true of the High at B and the Low at B1 ; these two anomalies are too far apart and too " sharp " to be assigned to the same ore-body, though of course there might be a connection between any of these bodies at a considerable depth. In no way can the anomalies at A1 and B1 be explained as he suggests in his Text-fig. 2.

An alternative explanation is that these Lows A1 and B1, and possibly some of the other Lows as well, may be due to ore-bodies " reversely " magnetized, that is possessing a residual magnetism derived from a former reversed earth's field. Such reversals of the field have been a frequent feature of the earth's magnetic history. If this is the case the extensive anomaly of + 5 gamma, shown in the right half of Text-fig. 4 may very well be associated with the Lows to the north of it.

There should be a good chance of detecting an ore-body under A1 or B1 by sensitive gravity measurements, as bodies giving rise to these anomalies of − 15 to − 20 gamma should produce a gravity anomaly of perhaps 0·3–0·5 milligals.

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SIR,—I was pleased to see Dr. C. D. V. Wilson's pertinent remarks on my paper. The alternative interpretations which he advances were carefully considered, together with some other possibilities, during the late stages of the survey and they continue to be borne in mind as further work continues.

Briefly, most of the possible explanations revolve around the question of whether or not the relationships between the main ore-body, the High A and the Low A1 are fortuitous. Dr. Wilson suggests that this may be the case as far as the Low A1 is concerned, and he interprets this Low as being due to a separate ore-body.

In the absence of other evidence to indicate the possibility of a deposit of haematite occurring just south of Llanharry, it was decided to advance the more cautious and conservative interpretation given in the paper. Thus, whilst Dr. Wilson's remarks might imply the occurrence of three new ore-bodies, the tentative interpretation put forward in the paper suggests the presence of only one large new body.

If the Low A1 is regarded as being due to the main ore-body, one of the major factors governing its position and value is the effective shape of the uppermost part of the deposit. The kinds of shapes involved are illustrated in Sibly's work, which is quoted in the paper. The idealized geometrical shape shown in Text-fig. 2 is merely a diagrammatic aid to illustrate in a qualitative way the principles involved. Until the evidence of boreholes in the area is available any more rigorous analysis of the results would be misleading if

not actually dangerous. Similarly, major assumptions regarding direction of polarization are to be avoided at this stage.

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THE STONE OF THE ANCIENT ASSYRIAN MONUMENTAL CARVINGS

SIR,—Thirty years ago there appeared in the *Geological Magazine* (lix, 1922, 222–3) a short paper by Dr. Hans Reusch, formerly Director of the Geological Survey of Norway, concerning the Assyrian carved monuments in the British Museum and in particular the winged human-headed lions from the palace of Sargon II at Khorsabad which now stand in the entrance to the Assyrian Galleries. Dr. Reusch described the stone in which these monuments are carved as a " quartz-eyed-gneiss ", i.e. a metamorphosed conglomerate, a type of rock with which he was familiar in Norway and which he had described from the Ordovician of the neighbourhood of Bergen.

In fact, the stone in question contains no quartz, the mineral which occurs so abundantly in large fragments in the Sargon lions and bulls being gypsum.

The rock is the so-called " Mosul Marble " which was much used as a monumental stone by the Assyrian kings under the name of *pilu* or *parutu* and which is still much used for architectural purposes in Mosul at the present day. It is gypsum of Miocene age, passing into anhydrite at depth as seen in the deeper quarries and in cores, which is well-bedded in parts but in some beds exhibits a striking brecciation owing to some diagenetic effect. Reusch also described small, closely folded granitic veins traversing the rock; these are no doubt films of gypsum showing the folding which frequently results from the increase in volume associated with the change from anhydrite to gypsum.

Specimens of the mineral fragments and also of the apparently argillaceous matrix were examined optically, chemically, and by X-ray powder photography and found to be gypsum. It can be stated therefore that the sculptures are made entirely of gypsum.

We are indebted for help and information to Dr. C. J. Gadd, Keeper of the Department of Egyptian and Assyrian Antiquities at the British Museum, and to Dr. F. R. S. Henson of the Iraq Petroleum Company.

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