

times. He now explains that he considers the parent peridotite magma of the leucite and melilite rocks to be largely derived from "re-fusion of the crystalline uppermost part of the Lower Layer". Ought he in that case to have called it a *primary* magma?

On the question of the determination of traces of the rarer constituents, Dr. Harwood has failed to notice that my criticism referred to gravimetric methods, not to the much more delicate colorimetric ones. I had in mind especially baria and strontia, since these oxides were used by Holmes to sustain his argument. Dr. Harwood admits that he is not prepared to defend the accuracy of the strontium determination as at present carried out, and that errors of 25 per cent and even 50 per cent may sometimes occur in the determination of other minor constituents; that is, he concedes everything that I claimed. I did not criticize the *principle* of comparative geochemical studies, but only the accuracy of the available data.

Mr. Golding thinks my criticism is unfair to the chemists, and defends the alcohol-ether method of determining strontia. I refer him to Dr. Harwood's opinion and to a paper by W. Noll (*Zeit. Anorg. Chem.*, 1931, p. 193), who shows that errors of 40 per cent are possible by this method. I did not and do not blame chemists for the fact that certain constituents are difficult to determine accurately, but I wished to bring home to geologists the very doubtful quality of some of the data on which Professor Holmes based his theory.

S. J. SHAND.

STELLENBOSCH, S. AFRICA.

4th April, 1933.

THE AGE OF THE FORD BEDS OF PEMBROKESHIRE.

SIR,—In their paper on "The Pre-Cambrian and Cambrian Rocks of Pembrokeshire", *Q.J.G.S.*, 1912, Professor O. T. Jones and Dr. H. H. Thomas tentatively referred the Ford Beds to "that position of the Upper Solva Group which is not far removed from the Menevian."¹ This identification was made on lithological grounds, assiduous search having failed to reveal any fossils, but its correctness has recently been confirmed by the discovery of a small fauna of Middle Cambrian age.

In the spring of 1932 Professor O. T. Jones conducted an excursion of the Sedgwick Club from Cambridge University to Western Pembrokeshire and a visit was paid to the section of Ford Beds exposed in the railway cutting at Wolf's Castle Halt. These beds are probably in a considerably more weathered condition than when originally searched for fossils and immediately behind the south-west corner of the shed upon the railway platform, about 7 feet

¹ *Q.J.G.S.*, lxxvii, 1912, 399.

above the base of the exposure, specimens of the following fossils were found by Miss F. E. S. Caldwell, Mr. M. Black, and myself :—

Agnostus exaratus Grönwall
Solenopleura applanata Salter
 and a horny brachiopod.

The presence of these trilobites, whose identification has been confirmed by Mr. Philip Lake, indicates that this portion of the Ford Beds may be referred to the zone of *Paradoxides hicksi* in the Middle Cambrian. It is quite consistent with the position assigned to the Ford Beds in the paper quoted above.

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 19th May, 1933.

Geological Survey Work in Malaya.

The Annual Report of the Federated Malay States Geological Survey Department for 1932 contains the information that an examination has been carried out of a considerable tract of hilly, jungle-clad country in the eastern part of Kinta in order to determine the extent of a band of highly metamorphosed schist which is now known to be interstratified with the crystalline limestone in two localities. The schist is found in a north-and-south belt near the margin of the great granite intrusion, and its association with scheelite in one locality and with tin deposits in others justifies further work on the subject.

During the year inquiries were answered about tin, gold, glass-sand, coal, iron, kaolin, limestone, and many other materials, and identifications of minerals and rocks were made on samples sent from the F.M.S. and other countries. An important part of the Department's work is now that of examining all prospecting results, old and recent, and a permanent record is being prepared. The value of this work to miners is self-evident, and there seems a likelihood that it may also be of great assistance to the Government in deciding upon the alienation of land.

Editorial Note.

In the note on Glacial Boulders at Verulamium in the last number the author inadvertently omitted to express his indebtedness to Dr. R. E. Mortimer Wheeler who kindly supplied the text-figure of Verulamium, which was reproduced through the courtesy of *The Times*.