

Bagshot series. A plate is given of the type-section in Sim's Clay-pit at Claygate.

Considerable space is devoted to a description of the river terraces and flood plain gravels, and a tentative correlation is given between these deposits and the implement classification.

A special chapter at the end deals with economic deposits, the nature of the soils being described under each stratigraphical division. An excellent bibliography is provided.

The plates are very interesting, being reproductions of old prints of London with notes on the geological points they illustrate.

Taken all round, the memoir is a great boon to geologists living in the area, both as a reference book and as a most lucid guide.

J. E. A. W.

THE OIL ENCYCLOPÆDIA. By MARCEL MITZAKIS. pp. 551.
London: Chapman & Hall, Ltd. 1922. Price 21s.

THIS book is not only what its title indicates, a dictionary of all practical matters concerned with the oil industry, but it is also something more, for it includes under the appropriate headings short summaries of the information available on many points of scientific interest, such as theories of oil-formation, the geology of oil-bearing regions, the chemistry of oil and its products, and many cognate matters. While in the compass of the short articles in this volume it is impossible to go deeply into such subjects, nevertheless, these summaries should prove extremely useful, while as a book of reference for locating little-known and out-of-the-way oil occurrences it will have great value. Short biographical notes are also given of the principal workers in this branch of industry, both scientific and economic. Where desirable references are also given to original publications.

CORRESPONDENCE.

THE MAGNESIAN GROUP OF IGNEOUS ROCKS.

SIR,—I would be glad if you would kindly afford me the opportunity of replying to the points raised by Mr. Tilley in the letter which appears in your issue of this Magazine of December last.

While Mr. Tilley acknowledges the existence of the group of rocks I endeavoured to describe, he objects to the use of the term "magnesian" on the assumption that the rocks under discussion contain notable amounts of magnesium only in the ultrabasic members; moreover, he states that it is iron and not magnesium that calls for attention in the less basic types. I have myself already mentioned the importance of the iron in my paper. As regards the magnesium, it is sufficiently clear, from the works of Holland, Lacroix, and other writers I referred to, that the high content of this mineral is far from being confined only to the ultrabasic members.

Further, I have referred to other cases in which the name of a characteristic constituent has been applied to a whole group of rocks; in these cases the name has been allowed to stand even when the special constituent is inappreciably developed in the extreme acid or basic members, or in unusual types. For instance, the alkaline and calc-alkaline suites are well-known to coincide at their acid and basic ends, and, moreover, intermediate members of the one suite can sometimes be distinguished from those of the other only by their close association with a characteristic type.

As regards the suggested list of magnesian provinces, I have admitted the possibility that further work may demand some modification, and it is certainly not to be expected that the areas named would be analogous in every respect. Nevertheless, at the time I drew up the list there appeared ample justification for the inclusion of all the areas named, but I thought it unnecessary, in a short general paper, to do more than refer to original papers. In my present circumstances, having no opportunity of consulting the necessary works again, I am unable, even if it were desirable, to put forward a detailed comparison of the various areas.

It is well known that the presence of hypersthene does not necessarily indicate a high proportion of magnesium in a rock; this also has been mentioned in my paper.

In conclusion, I may perhaps be permitted to suggest that it is still rather early to base arguments concerning the crystallization of deep-seated magmas upon chemical equations. Moreover, as regards the contact metamorphism of norites, the chemical reactions suggested by Mr. Tilley do not appear, in the case of various occurrences that have been examined in detail, to be in accord with the results of petrological examination. I believe I am correct in stating that recent additional work upon the Huntly intrusions,¹ referred to by Mr. Tilley, has indicated that the cordierite of these rocks is due entirely to absorption of sedimentary material, and not, even in part, to invasion of one intrusion of norite by another. Again, in the case of the norite complex of the Sierra Leone Peninsula, where several phases of metamorphism have been developed as a result of the invasion of earlier members of the complex by later, the actual changes observed are also very different from those suggested, especially in that no trace of cordierite has been found.

F. DIXEY.

NYASALAND.

January, 1922.

[The foregoing letter was unavoidably crowded out of the April number; however, a proof was submitted to Mr. Tilley, whose reply is printed below.—EDITOR.]

¹ Cf. H. H. Read on "Some Contaminated Rock Magmas", paper read before Section C (Geology) at the Edinburgh meeting of the British Association for the Advancement of Science, September, 1921.

SIR,—Mr. Dixey's special pleading for the use of the term "magnesian", and for the setting up of a third great group of igneous rocks co-ordinate with the alkaline and calc-alkaline suites, carries little conviction in its train.

The impropriety of the term "magnesian" is sufficiently evident on inspection of a series of first-class analyses of rocks of the charnockite series, from any of the well-defined provinces such as those of Southern India or Western Norway.

The ground of Mr. Dixey's paper was largely covered by H. S. Washington in 1916 in his paper on "The Charnockite Series of Igneous Rocks" (*Amer. Journ. Sci.*, vol. xli, pp. 323-38), but with somewhat different conclusions. In summing up the chemical characters of charnockite provinces, he was led to state that "they are characterized by the dominance of iron oxides over magnesia and lime, the two latter being present in about equal amount".

One word with regard to the concluding paragraph of Mr. Dixey's letter. Mr. Dixey has missed the point of my remarks if he has not perceived that the reaction discussed was in no way dependent on any intrusion of norite by a later member of the series.

The cordierite-norites of Minnesota described by Winchell (*Amer. Geol.*, vol. xxvi, 1900, p. 151) afford an even more instructive illustration of the development of hypersthene than those of the Huntly area cited. The normal gabbro from which the cordierite-norites are developed by assimilation of aluminous sedimentary material, is free from rhombic pyroxene, while the cordierite-norites are free from the monoclinic type.

The inaccuracy of the reaction I have stated for the disappearance of diopside, when cordierite appears, can be admitted when Mr. Dixey can produce cordierite-norites, which, apart from armoured relics, contain monoclinic pyroxene, as in the gabbros or norites with which they are associated.

C. E. TILLEY.

THE ENGLISH ESKERS.

SIR,—Professor Gregory scores. The passage quoted by me from the Geological Survey Memoir on the Yorkshire Coalfield does refer, I agree, to mounds which only in part belong to the Lanshaw Delves series, and not at all to the Delves themselves. *Touché!* The fact remains, however, that Carvill Lewis specifically mentions "Lanshaw Delves, and limekilns have been built upon them". So Professor Gregory is honourably acquitted of ignoring two statements of the fact; he ignored only one. I will not labour the point of whether Russell's "four-tenths" of the great Memoir on the Yorkshire Coalfield includes the passage under discussion, but content myself with remarking that the quaint "harbour-bar" hypothesis for the Bingley Mounds is found also in his early paper in the B.A. report for 1873.