

CORRESPONDENCE.

THE APPLICATION OF MECHANICAL ANALYSIS TO GEOLOGICAL MAPPING.

SIR,—Volume xl (1929) of the *Proceedings of the Geologists' Association* contains a paper on the geology of the country around Reigate. This describes some of the results of an intensive study of a relatively small area, in which the Lower Greensand rocks consist almost entirely of sands, silts and clays and are devoid of fossils. In these circumstances it was found desirable to supplement observations of ordinary lithological characters by a free use of mechanical analysis. As the work proceeded it was found that there was no great difficulty in distinguishing the two larger divisions, viz. the Folkestone Beds and the Hythe Beds, from each other in the field, since it was discovered that the glauconitic silts and sands which are regarded as the representatives of the Sandgate Beds in this district, extend right across the area surveyed.

It was, however, desired to find out whether there were any characteristic differences between successive strata on a smaller scale, and if such existed to sub-divide the main divisions, and further to determine to what extent these facies horizons persisted along the outcrops or in what way they varied or developed laterally. The results obtained appeared to be sufficiently interesting to be recorded, and they were set out in the paper in the opening paragraphs of the section on Stratigraphy and in the sub-section on the Application of Mechanical Analysis.

Since the Reigate paper was published, the Officers of the Geological Survey have finished a survey of the whole of the 1 in. sheet of the Ordnance Map which covers the small area dealt with in the paper. Section VII of Part II of the *Summary of Progress of the Geological Survey for 1929*, under the title "The Application of Mechanical Analysis to Geological Mapping", describes what the authors have accomplished by the use of this method in the districts lying east and west of the Reigate area. The authors state that their results were such as to yield no indication of the horizon of the samples, and that they were negative as regards evidence for use in geological mapping.

The authors also include in this section a number of quotations from the Reigate paper, which set forth the main conclusions arrived at from the work done in that district to which the use of mechanical analysis contributed, and, on the ground of the work done by themselves in the adjoining areas, they dissociate themselves from such conclusions. Moreover, the authors commit themselves to such broad negative propositions as that "it is unsafe to base any

stratigraphical deductions on evidence gained by the application of the methods of mechanical analysis to the Cretaceous sediments".

In view of these aspects of the authors' publication it seems desirable that there should be no delay in giving expression to some of the criticisms for which they call. It is not, however, possible to do this fully in the limited space of a letter. One must be content here to call attention in the briefest manner to a few of the points which call for comment.

For example, the authors assume (1) that the Reigate paper deals with the Lower Greensand, and even the Lower Cretaceous sediments in general, and prescribes stratigraphical divisions of general application irrespective of their extent or location: and (2) that mechanical analysis was used primarily for the purpose of discriminating between the larger divisions of the Lower Greensand, for example, the Folkestone Beds and the Hythe Beds. With regard to the first assumption, it is surprising that it should be necessary to point out that the Reigate paper deals, in fact, with a restricted area, and that the results obtained from a very large number of analyses are valid for that area. Obviously, from the nature of the case, the bearing of these results on adjoining or other areas can go no further than to suggest that a similarly thorough use of mechanical analysis might possibly yield equally interesting results. As to the second assumption, it is only necessary to read the first page of the section on Stratigraphy in the Reigate paper, especially the first four sub-paragraphs, which the authors themselves quote on p. 75 of the *Summary of Progress*, to perceive that the purpose in view and the results arrived at had reference primarily to the sub-division of the major divisions: the distinctions drawn later in the paper between the major divisions as wholes emerged from a comparative study of the whole series of curves.

The principal criticism of Section VII of the *Summary of Progress* relates, therefore, to propositions which were not stated in the Reigate paper, and so calls for no reply further than pointing out the authors' erroneous assumptions.

With regard to the authors' own work, it will suffice for the present to draw attention to the fact that the sweeping negative conclusions arrived at were based on a total of twenty-four samples collected from many square miles of Lower Greensand outcrops east and west of Reigate.

A fuller treatment of these points and of others raised in the *Summary of Progress* awaits an opportunity for further publication.

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