THE METAMORPHIC ROCKS OF SOUTH DEVON.

SIR,—The writer of the letter printed in your January issue on this question (p. 46) does not seem quite to recognize the position which the microscope occupies in the investigation. As Professor Bonney in his previous letter to your journal kindly alluded to my work in the district under discussion, I may perhaps be allowed briefly to indicate the point, which, as it seems to me, is rather overlooked by Mr. Somervail. How he can have supposed Professor Bonney has anywhere stated that the microscope in geology is "everything" to the exclusion of field-work I cannot understand, for I remember more than one passage in which the opposite opinion is expressed.[1] The two modes of investigation are two independent witnesses, and the question is, can there be any value in a result founded on the one testimony alone, when an investigator, extremely well qualified to interrogate both, has come to an opposite conclusion? It is not even as if the two methods result in a complete contradiction. It is rather that the rocks at Hall Sands form one of those difficult cases where the unaided eye can scarcely be trusted. Here we find, almost in juxtaposition, a "schistified" fragmental rock and a "fragmentalised" schist. The question then is, can we draw a line of separation between the two? He who relies on field evidence alone may say, I cannot see it; but the worker with the microscope replies, There is a clear distinction. The positive statement, which is the result of employing the more delicate process of investigation, must surely be of the greater value; and in such case one could not rely on a hesitating or negative answer, which had been the only outcome of the more rough-and-ready method. But, in my opinion, even the field evidence is strongly in favour of the distinctness of the two series of rocks, when we take into consideration the sections, which occur elsewhere than at the coast of Hall Sands. The evidence of an abrupt change from a crystalline to a non-crystalline rock seems to me perfectly clear, not only at Hope Cove, but also along the estuary shores north of Salcombe and towards South Pool, and inland near Killington.

I was especially interested, in my first visit to the district, in the chlorite schist quarries near Hall Sands,[2] which are described in the article in the Devonshire Transactions; for this occurrence of chlorite schist completely disposes of any theory of progressive metamorphism. Certainly there can be no gradation from the slates of Hall Sands to chlorite schist. But I am puzzled by Mr. Somervail's statement that this chlorite rock reappears in the valley "on the north of Professor Bonney's junction, where according to his view it has no right to occur." The chlorite rock occurs to the south of the valley, and I do not understand on what grounds it is asserted to be north of the junction. Professor Bonney indicates the fault by a dash, which necessarily on a map of so small a scale,

[1] GEOL. MAG. 1880, p. 299; and 1879, p. 203.

[2] In my map as published in the Quarterly Journal, two lines, which unfortunately escaped my notice, have been accidentlly introduced, making it look as if slate existed in the Bickerton quarry in contact with the schist. The quarry, as described by Mr. Somervail, is entirely of chlorite schist, with slickensided bands.

covers some inland country, but, as is clear from his description, he limits himself to the coast, and did not attempt to trace the faults inland, so that no arguments can be founded on the length or direction of this line, any more than on the breadth of the zone shaded to represent the occurrence of this or that rock in the cliffs. At Hall Sands the chlorite rock is not seen in situ along the shore, though it may exist beneath the sand on the south part of the beach. But I do not believe that it would occur, as seems to be suggested by Mr. Somervail, further to the north, because before that it would be cut out obliquely by the boundary fault.

To conclude:—as to the proof of a fault, I believe that if Mr. Somervail undertakes a microscopic investigation, after having gone through his intended course of study with that instrument, he will find that the strata are, as he demands, "thoroughly opposed to each other in mineral aspect." While the result of field-work is, that beds of chlorite-schist and of mica-schist strike up towards a certain boundary-line, and seem to be there cut off, which is surely suggestive of the existence of a fault.

C. A. Raisin.
85, Hungerford Road, N.

MISCELLANEOUS

The New Professor of Geology at Oxford.

We are much pleased to announce that Mr. A. H. Green, M.A., F.R.S., F.G.S., has been elected to fill the office of Professor of Geology in the University of Oxford, a post rendered vacant by the retirement of Prof. Prestwich. Mr. Green, who is a Cambridge man, was Sixth Wrangler in 1855, and was subsequently a Fellow of Caius College. In 1861 Mr. Green was appointed an Assistant Geologist on the Geological Survey of Great Britain, and in 1867 he was promoted to the rank of Geologist; during his service he surveyed considerable areas of the Jurassic and Cretaceous rocks in the Midland counties, and of the Carboniferous rocks in Derbyshire, Yorkshire, and other northern counties. Many Survey Memoirs have been written wholly or in part by Mr. Green, among which we may mention the Geology of Banbury (1864), and the geological descriptions of the country around Stockport (1866), Tadcaster (1870), Dewsbury (1871), Barnsley (1878), and Wakefield (1879). The memoir on the Geology of North Derbyshire, of which the first edition was published in 1869, was written chiefly by Mr. Green, and the second edition, published last year, contains additions by him. His most important Survey work is the Geology of the Yorkshire Coal-field (1878).

In 1874 Mr. Green was appointed Professor of Geology in the Yorkshire College at Leeds, and while he completed some official Survey work after that date, he also published in 1876 a Manual of Physical Geology, a work which has taken a leading place as a text-book for students and teachers on this branch of the science; a third edition was issued in 1882. We may mention that for several years Mr. Green held the Lectureship on Geology at the School of Military Engineering at Chatham; until the authorities at