Cirencester and Andoversford, are described in detail by Prof. Allen Harker and Mr. S. S. Buckman.

Prof. Harker's contribution is "On the Sections in the Forest Marble, and Great Oolite Formations, exposed by the new railway from Cirencester to Chedworth." The diagram he gives is unfortunately very much cramped, but it serves as an index to the localities mentioned. Mr. Buckman gives an account of "The Sections exposed between Andoversford and Chedworth: a comparison with similar strata upon the Banbury line." These sections are mainly in the Inferior Oolite, whose many local subdivisions are duly noted. There is also a short paper, accompanied by a plate, by Mr. E. Wethered, "On the Occurrence of Fossil Forms of the Genus *Chara* in the Middle Purbeck Strata of Lulworth, Dorset."

CORRESPONDENCE.

MR. SOMERVAIL'S CONTRIBUTIONS TO THE PETROLOGY OF THE LIZARD.

SIR,—During the last three years the GEOLOGICAL MAGAZINE has been augmented by four communications from Mr. Somervail on the Petrology of the Lizard. These I have refrained from noticing (beyond making in one case a brief protest), because I wished to re-examine the whole district before writing anything more on the subject. Last summer I had the advantage of spending some time at the Lizard in company with General McMahon and the Rev. E. Hill, and we hope to bring the results of our examination before the Geological Society during the present session.

To point out the errors in observation and inaccuracies of induction in Mr. Somervail's papers would occupy far too much space in the MAGAZINE and weary the patience of your readers. I must content myself with a general expression of opinion as to the dominant idea in each communication. First, "On a Remarkable Dyke in the Serpentine of the Lizard."[1] This is a group of separate dykes, diorite and granite, the latter containing some fragments of an older rock, and associated with a quartz-felspar vein; it is no part of the "granulitic group," as I have defined it, and gives no support to Mr. Somervail's notion of rocks of different composition segregating from one magma.

(2). "On a Breccia and an Altered Schist at Housel Cove, Lizard."[2] Here the ordinary hornblende schist has been cut by a dyke, and a fault running nearly along one surface of junction has brecciated the latter. Perhaps this dyke differs a little in composition from the types which are common at the Lizard, and there is a good example of fault breccia. As usual both rocks are rotten, but the section leads to no particular conclusions.

(3). "On the Greenstone and Associated Rocks of the Manacle Point."[3] This section is a difficult one, and there are points which

[1] GEOL. MAG. 1888, Dec. III. Vol. V. p. 553.
[2] GEOL. MAG. 1889, Dec. III. Vol. VI. p. 114.
[3] GEOL. MAG. 1889, Dec. III. Vol. VI. p. 425.

must be left for further work. On one, however, I feel quite clear, namely, that the relations of the rocks have been completely misunderstood by Mr. Somervail.

(4). "On the Nature and Origin of the Banded Structure in the Schists and other Rocks of the Lizard District."[1] As this subject will form an important part of our paper, I content myself with observing that I can find no ground for Mr. Somervail's hypothesis of segregation, as he applies it. I question both the accuracy of his statements and the validity of his inductions. Doubtless before writing upon these difficult subjects, Mr. Somervail has trained himself by careful study both of rock-structures under the microscope, and of rock-relations in less complicated districts of other regions; but if so, I am utterly at a loss to understand his principles of interpretation and his methods of reasoning.

T. G. Bonney.

BANDED ROCKS OF THE LIZARD.

Sir,—Mr. Somervail in his paper on the Lizard rocks, published in your last issue, advances the theory of segregation to explain all the phenomena displayed by the eruptive rocks of that interesting locality, but he does not favour us with any evidence in support of his theory, and he omits to explain facts that seem incompatible with it. That such rocks as peridotite, gabbro, diorite, basaltic, and felspathic traps, and granite—rocks of well-defined species differing from each other in mineralogical contents, structure, and chemical composition (points that imply genetic differences)—should be formed on the spot by segregation from a "common magma," is sufficiently startling to the petrologist; but when we find, as competent observers have found, that these rocks cut each other in well-marked dykes following each other in a regular sequence, and that each of the principal intruders carries along with it sharp fragments of the rocks through which it has intruded, the hypothesis involves the rejection of every canon of interpretation hitherto relied on by field geologists.

When one sees diverse igneous rocks cutting across each other in a way that implies differences in their order of eruption; and when one finds the lines of demarcation between these *successive* eruptions so sharp that even thin slices examined under the microscope show a sudden transition from a rock of one chemical and mineralogical composition to another of different chemical and mineralogical composition, it seems as unreasonable to a petrologist to attribute the formation of these definite and distinct species to segregation *in situ* as it would be to attribute the jaw-bone and teeth of a well-known quadruped, found in a bed of marl, to the fortuitous segregation of the carbonate of lime.

The above-mentioned rocks not only cut each other with a definite sequence, but they preserve their individual characteristics, whether

[1] Geol. Mag. 1890, Dec. III. Vol. VII. p. 515.