

duced a highly schistose structure. Its various mineral constituents are much crushed, flattened and broken up into fine fragments, the long axes of which conform more or less to the planes of cleavage produced by the great mechanical pressure the rock has here undergone. The original porphyritic structure, though much crushed, is yet distinctly traceable, and further north, where the rock is less cleaved or schistose, as towards Porthkerris Cove, and Point, the porphyritic structure much abounds.

There is another point with regard to the Porthonstock greenstone which must not be overlooked, that is, the tendency of the rock in parts to assume the granulitic structure, which, although on a small scale here, is yet the same type of rock as met with in the southern areas. This also is, I contend, but a portion separated from the greenstone by segregation, so that from the parent mass of the gabbro has been evolved the granulitic and the greenstone, which latter by subsequent dynamical movements has been converted into hornblende-schist.

This explanation I am inclined to regard as no mere speculation, but as a fair and just inference based on what we can observe in many localities at the Lizard. In some of these localities all three rocks, gabbro, granulitic, and hornblende, are more or less interchangeable, and a distinct passage can be traced between them all. In certain areas large tracts of the latter rock, which seems to have formed the upper or outer margin of the gabbro, have been cleaved into what now form the schists, while the more granulitic portions, although closely adjoining, have from their coarse and granular nature been much less affected.

It will, I think, be ultimately found that segregation has played a most important part among all the rocks of the Lizard district. The bands of hornblende so frequently occurring in the serpentine in various localities are due, I think, to this cause. The dykes in the outer rocks off the Lizard Head, mapped with such care, and not without danger, by Mr. Howard Fox, F.G.S.,¹ are, I believe, true segregation dykes. The banded structure in the hornblende-schists and associated gneissic rocks is also in my opinion due to this same cause, a subject I hope to deal with very shortly.

If the present suggestion is correct, in reducing the triple division of the rocks at the Manacle Point to mere varieties of one original magma, it seems to go a long way towards simplifying the geology of the rest of this most interesting district.

NOTICES OF MEMOIRS.

1. "ON A HEAD OF *HYBODUS DELABECHÆI*, ASSOCIATED WITH DORSAL FIN-SPINES, FROM THE LOWER LIAS OF LYME REGIS, DORSETSHIRE." By A. SMITH WOODWARD. Ann. Report Yorksh. Phil. Soc. 1888, pp. 58–61, pl. i.

THROUGH the generosity of Mr. William Reed, F.G.S., the Yorkshire Philosophical Society is enabled to publish, in its recently-issued Report for 1888, a fine quarto plate (drawn by Miss G. M.

¹ On the Gneissic Rocks off the Lizard, Q.J.G.S. May, 1888, p. 309.

Woodward) of the most perfectly preserved head of the Liassic Shark, *Hybodus Delabechei*, hitherto discovered. The specimen is contained in the Reed Collection of the York Museum and exhibits, for the first time, the precise arrangement and relative proportions of the teeth, in addition to some of the characters of the cranial cartilage. The mandibular teeth are disposed upon each ramus of the jaw in ten or eleven transverse series, being thus more numerous than in *Acrodus*; and there is no azygous series of symphyseal teeth. The dorsal covering of shagreen is sparse, and the absence of barbed, lateral head-spines is somewhat remarkable.

2. FISH REMAINS FROM THE LOWER COAL MEASURES OF LANCASHIRE. By HERBERT BOLTON. Trans. Manchester Geol. Soc. vol. xx. pt. viii. 1889.

THE author records the occurrence of fossil fish remains in shale overlying the Upper Foot, or Bullion Mine Coal, in Rossendale, and publishes brief notes upon the specimens. A large *Elonichthys* appears to be referable to *E. semistriatus*, Traq.; a head of *Cœlacanthus* is shown to differ in some respects from that of the common *C. lepturus*; and other less satisfactory fragments do not permit of any tolerably precise determination.

3. "UEBER ZWEI FISCHER AUS DEN ANGULATSKALKEN DES UNTER-ELSASS." By W. DRECKE. Mittheil. Commission geol. Landes-Untersuch. Elsass-Lothringen, vol. i. 1888. 11 pp. 1 pl.

THE author describes a new species of *Heterolepidotus* and another of *Dapedius* from the Angulatus-beds of Alsace, and claims these to be the oldest Liassic fish-remains hitherto discovered. *Heterolepidotus angulati* is founded upon the well-preserved trunk of a typical member of the genus, closely related to *H. serrulatus*, but differing in the smoothness of the scales. Of *Dapedius cycloides*, a complete fish forms the type-specimen, and this seems to differ from the well-known *D. orbis* of Barrow-on-Soar, merely in the prominent sculpturing of the scales upon the foremost half of the trunk. Of the *Heterolepidotus* a description alone is given; but of the *Dapedius* there is a good photograph, with explanatory lettering upon a traced outline of the fossil.

R E V I E W S.

- I.—THE MIDDLE LIAS OF NORTHAMPTONSHIRE. By BEEBY THOMPSON, F.G.S., F.C.S. (London, Simpkin, Marshall, & Co.) 8vo. pp. 150. Price 3s. 6d.

SINCE the days when Samuel Sharp laboured so successfully among the Oolites of Northamptonshire, no one has studied more assiduously the county geology than the author of the present work. Confining his attention mainly to the country accessible from the town of Northampton, he has added largely to our knowledge of the Upper Lias, in papers published in the Journal of the Northamptonshire Natural History Society; and he now gives us the