

and a sinking of the waters to their present level. By this latter action we had the water, so to speak, split up into separate areas. This would explain the similarity in the fauna of the different districts, should it ever be proved satisfactorily to exist, and also the presence of salt lakes in the Trans-Baikal territory, where the waters, for want of outlet, have become gradually supersaturated, until now they annually form a deposit on their shores.

Most of what I have said about the Baikal, it will be seen, is based on scanty evidence, and must only be accepted until something better can be obtained. When the geology and zoology of these districts have been further investigated, it remains to be seen if we get indications as to the origin of the physical features of this part of the world still pointing in the same direction, as those do which we have at present in possession.

So far, then, I am content to believe that at one time, in this portion of the world, there were inland fresh waters which deposited alluvium, and, as these retired, the Baikal, with its surrounding lakes and lakelets, were left like pools behind a flood.

REVIEWS.

I.—SECTIONS OF THE NORTHUMBERLAND AND DURHAM COAL-FIELD.

By J. B. SIMPSON, M.E. (Large folding sheet, published by A. Reid, Newcastle-on-Tyne, 1877.)

THE times when mining engineers jealously kept their local knowledge to themselves are rapidly passing away, and it is but rarely now that information of a scientific character is withheld from the public. The publications of the Geological Survey teem with acknowledgments of assistance rendered by the very men who, years ago, would have thought it their duty to oppose obstacles to the progress of such work. There are still exceptions, but they are few and far between—survivals, but not of the fittest. The issue of the handsome sheet before us is a case in point. Here Mr. Simpson, well known as one of the most active of North-country mining engineers, and the author of more than one paper of geological interest, has given the world a key to the structure of the great Northern Coal-field, of which it is difficult to speak with sufficient praise. In the right-hand corner of the sheet an index geological map shows the limits of the field, its chief lines of fault and the lines of section, one N. and S., and the other E. and W., the detailed illustration of which forms the chief object of the plate. This object is attained by means of nearly fifty actual measured vertical pit-sections carefully drawn to scale, and placed side by side in order across the sheet. To the left stands a general section in which every recorded Coal-seam is given and numbered, corresponding numbers being used in all the other sections for the same beds, thus enabling one to ascertain at a glance the author's views as to the equivalence of the minor seams. This is perhaps the most valuable feature of the publication. As a datum-line the Low-Main or Hutton Seam has, we think very properly, been chosen.

Two longitudinal sections along the lines mentioned give a good idea of the general connexion of the details.

As a whole, the structure of the Tyne, Wear, and Tees Coal-field is simple enough, and since Buddle's remarkable papers on the larger seams of the district, the general equivalence of these has been fairly well understood. With the minor seams, however, this is not the case, and every one will appreciate the obligation under which Mr. Simpson has placed northern geologists and mining men in giving them the results of his observations on the subject. In some instances even now the correlation of the seams is still doubtful, especially in the extreme north. When this is so, a special mark attached to the sections denotes the uncertainty.

The nomenclature of Coal-seams has ever been eccentric, and here we have this brought vividly before us. The names in use in the Tyne district are not those of the Wear Valley, while yet other names are given to the same Coals in the Derwent area.

The care with which this chart has been drawn up is evidenced by the fact that even the small seams lying between the Brockwell seam (the arbitrary base of the Coal-measures) and the Millstone-grit are duly entered in their places. In this interval we have the group of beds sometimes referred to as the Ganister series, although the rocks composing it are indistinguishable from those either above or below, and no marine fossils have, so far as we are aware, been found in them yet. The fine-grained, white, rootlet-pierced, sandstones, which give their name to the division, are found both in the beds above the Brockwell seam and in the Carboniferous Limestone or Bernician rocks far below. We are therefore pleased to see that Mr. Simpson includes the series (some 300 feet thick) in the Coal-measures proper, in which, indeed, he has, very judiciously, recognized no divisions whatever. The entire thickness of the Coal-measures, according to him, from the highest bed known in Boldon Colliery (between Sunderland and Newcastle), and the top of the Millstone-grit, is about 2125 feet. What thickness of upper beds was removed before the deposition of the Permian deposits (the unconformity of which is well shown in these sections), there is of course no means of knowing.

Mr. Simpson's diagram, while it is indispensable to all local inquirers, cannot fail to be appreciated by geologists and mining engineers everywhere as the latest, readiest, and most accurate summary of all that is important respecting the Newcastle Coal-field.

G. A. L.

II.—ON VOLCANIC ACTION AS A PHENOMENON OF THE UNIVERSE. By Prof. GUSTAV TSCHERMAK, Member of the Imperial Academy of Sciences. Read 8th March, 1877. (From vol. lxxv. of the Transactions of the Imperial Academy of Sciences, 1st part, March number, 1877. Vienna.)

THE author has formerly suggested that all stars in the course of their development pass through a volcanic phase. The moon's mountains have been thought by Hooke, Nasmyth, and Carpenter,