them at Lebrusch, on the flanks of the Moabite hills above the shore of the Dead Sea. I supposed, therefore, that Dr. Schweinfurth had found what we had failed to notice. But, on reading further, the matter was set at rest. It is somewhat unfortunate, and tending to confusion, that there are two Arabah valleys, one in the eastern part of upper Egypt, opening out on the Gulf of Suez, and the other connecting the Gulf of Akabah with the Dead Sea and Jordan Valley. The former is that referred to by the African explorer, and is of special importance as helping to connect the geology of the Upper Nile Valley with that of Arabia Petræa. Dr. Schweinfurth recognizes the identity of the beds he describes with those of the Wadi Nasb in the Sinaitic Peninsula, where limestone containing fossils of Carboniferous Limestone age, first discovered by Mr. Bauerman, are interposed between crystalline rocks and sandstones and other strata of Cretaceous age. These beds were afterwards examined by Col. Sir Charles Wilson and by the Members of the Expedition of 1883—84, and the fossils brought home by them were determined by Prof. Sollas.[1] Of this identification of the beds of the Wadis Nasb and Arabah there can be no question, as the genera of the fossils are in most cases identical, and the species characteristically Carboniferous.

The following is a section of the beds in the escarpment of the southern flank of the plateau of north Galala, descending to the bottom of the Wadi Arabah, in Upper Egypt, as given by Dr. Schweinfurth :—

Summit of Escarpment; 1400 m. above the sea.

300 m.—Terraines Tertiaires du Parisien.
200 m.—Terraines Tertiaires Londinien (?).
200 m.—Banks of débris covering Cretaceous-beds of Stages *Up. and Lr. Senonien.*
50 m.—Argillaceous and Marly ochreous Limestone and sandy beds with *Ammonites. Senonien inferieur.*
250 m.—Escarpment of red Nubian Sandstone. (*Terrains Crétacés d'incertains étages*).

(Geat Geological hiatus.)

2 m.—Dark Sandstones with silicified wood (*Araucarioxylon*). *Lower Carboniferous.*
60 m.—Solid and soft Sandstones and Marls, with fragments of Crinoids, and *Spirigera.*
1 m.—Bed of hard blue Limestone—with *Crinoids*, *Productus*, *Spirifer*, etc.—(Carboniferous Limestone).
40 m.—Marls and Sandstone partly fossiliferous.

Lower Carboniferous.

(Details of beds below this not given.)

Geological Survey Office, Dublin, 23 *May*, 1888. E. H.

THE ATMOSPHERE OF THE COAL PERIOD.

Sir,—From the silence of your reviewer, I presume that he is unable to verify the assertion so often made that experiments had proved the improbability of plants living in an atmosphere containing an excess of carbonic acid. As I before remarked, very few definite experiments had been made besides the one I have quoted in my work. I might, however, have referred to those made by

[1] "Physical Geology of Arabia Petræa and Palestine," Mem. Palestine Exploration Fund, p. 48.

Daubeny in his Reports to the British Association 1847—1850, "On the Influence of Carbonic Acid Gas on the Health of Plants, especially to those allied to two Fossil Remains found in the Coal-formation." These, although wanting in definite measures and not embracing the whole field of inquiry, are of great value so far as they go, as they confirm at all events the possibility of the original suggestion of Brongniart with respect to the condition of the atmosphere during the Coal Period.

Daubeny showed that *Lycopodium* continued during five weeks in perfect health in an atmosphere containing 5 per cent. of carbonic acid, though species of *Adiantum* appeared less thriving than the corresponding plants not so treated, but that 20 per cent. of carbonic acid proved injurious in two or three days. He also found that Frogs and Newts did not appear to suffer in an atmosphere containing 5 per cent. of the gas. This, however, is a proportion quite excessive and perfectly unnecessary for the object in view, and is therefore beyond the mark. Nevertheless, Daubeny came to the conclusion that the general tenor of his experiments justified him "in inferring that there is nothing in the organization of those plants and animals of the present day which appear most nearly allied to such as were in existence during the Carboniferous epoch, or even somewhat subsequent to that period, militating against the probability, that a larger amount of carbonic acid may have been present in the atmosphere and diffused throughout the waters of the sea and rivers, than is found either in the one or the other at the present time; nor is there anything to prevent us from imagining that the absorption of carbon by vegetables and the consequent rapidity of their growth may, at least within certain limits, have borne some proportion to the greater amount of carbonic acid assumed to have been present at earlier periods in the history of our globe."

JOSEPH PRESTWICH.

THE GEOLOGY OF MYNYDD MAWR.

SIR,—I have been much interested in Mr. Harker's description of the rocks of Mynydd Mawr and the Nantlle Valley. His observations on the cleavage structure round the intrusion point it out as a great "eye," whose main axis runs parallel to the cleavage of the district. Last year, while endeavouring to work out the structural relations of the mass, I paid considerable attention to all the junctions, especially those along the S.E. flank. These are everywhere of an obviously intrusive character, the "quartz-porphyry" frequently transgressing upon the bedding of the slates. The main difficulty about the junction to me was that in some places the slates dipped under the intrusive mass, while in others they dipped off it. But I found one section in which the bedding rose vertically, and then bent outwards at an angle of 45°, the porphyry in the upper part resting on the slate. Probably this relation of the two rocks frequently exists round the hill, the lines of rock flowing (if we may use the term) round the intrusion not only in a horizontal but also in a vertical direction.

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