

The most curious section, however, was that near the powder-house, where the railway skirts the edge of Kingsweston-park; the beds are contorted, and thrust upwards in the middle, forming an anti-clinal curve. These curved strata belong to the Old-red-sandstone series; and lying horizontally on the top of them is a bed of New-red-conglomerate. After passing beds of red clays and sands, the party left the line of the railway, and came down through Shirehampton into the marshes, where the botanists and zoologists found many opportunities of adding both to their collections and to their knowledge of the habitat of many minute organisms.

At a quarter past four the whole party re-assembled at Hooper's Hotel. Mr. Sanders then gave a brief geological sketch of the sections passed through that morning, and concluded by calling on Professor Buckman, who after referring to the fact of his having been secretary for seven years to the Cotteswold Field-club, said that he had met that day with a greater variety of plants than usual in a walk of the same extent, and especially was this the case with the grasses, which were his peculiar study.—*Bristol Daily Post*, June 20th.

THE DUDLEY AND MIDLAND GEOLOGICAL SOCIETY AND FIELD-CLUB.—The first field-meeting was held at Cannock Chase, on 21st June. After leaving the Brownhills Station the party crossed the great Eastern Fault of the South Staffordshire Coalfield, and after traversing the more ancient collieries at Brownhills entered the extensive Cannock Chase Colliery, held by Messrs. McClean and Co. of the Marquis of Anglesea. Four seams of coal are here worked. The value of the 'Shallow' and 'Deep' coal-seams is well known. Gas is introduced into the pits as well as used on the surface, and the whole arrangements, both above and below ground, are unexceptional. The next point of geological interest was the section of coal-measures laid bare in cutting a branch line to the Hednesford Collieries. After visiting these latter works the members met for dinner and discussion, and a paper was read by Mr. Jones (the Secretary) on 'Organization in Field-club Work.'—J. J.

CORRESPONDENCE.

ON THE OCCURRENCE OF CYCLOID FISH-SCALES, &C., IN THE OOLITIC FORMATION.

To the Editors of the GEOLOGICAL MAGAZINE.

IT has hitherto been stated, that the remains of Cycloid and Ctenoid Fishes are not met with in strata older than those of the Chalk formation; an opinion, I believe, originating with that distinguished ichthyologist, M. Agassiz, when forming his arrangement of fishes by their scales into the four orders, namely, Placoid, Ganoid, Ctenoid, and Cycloid.

In a paper read before the Geological Society of London, Nov. 5,

1834, Prof. Agassiz says:—‘If we estimate the number of fishes now known to amount to about 8,000 species, we may state that more than three-fourths of this number belong to two only of the above-mentioned orders, namely, the Cycloidians and Ctenoidians, whose presence has not yet been discovered in the formations inferior to the Chalk.’

Relying, no doubt, upon such high authority, eminent Palæontologists of our own country have perpetuated that statement to the present time. For example, the late Dr. Mantell says, in his ‘Medals of Creation:’—‘According to the data at present obtained, all the osseous fishes anterior to the Chalk belong to genera which have no representative among existing species, and they are characterized by rhomboidal scales, covered with enamel.’ These are therefore the scales of *Ganoid* fishes.

Professor Owen, in his ‘Palæontology,’ published as late as 1861, writes, page 175:—‘Seeing that the earth yields no indisputable evidence of Ctenoids or Cycloids anterior to the Cretaceous epoch . . .’ From which I infer, that he has met with no information to remove from his mind the dictum of M. Agassiz.

In 1852, at the meeting of the British Association at Belfast, I communicated my discovery of parasitic borings in fossil fish-scales from the Chalk formation. Soon afterwards, when pursuing similar researches, on examining the laminated shale of the Kimmeridge Clay from Ely, and also in Norfolk, I found along with small vertebræ and ribs unmistakable *Cycloid* scales, and these scales had been attacked by boring parasites.* Herewith I send two enlarged outlines of scales from the specimen of Kimmeridge shale in my collection;



Fig. 1.

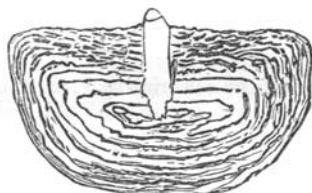


Fig. 2.

Fish-scales from the Kimmeridge Clay (much enlarged).

one from a common scale (fig. 1), the other from a lateral tubular scale (fig. 2). The size of the common scale is $\frac{1}{8}$ th inch in width, by $\frac{1}{4}$ th in its antero-posterior diameter. When in London this spring, Mr. Davies, of the British Museum, showed me a small slab of Kimmeridge shale, containing fish-bones and fish-scales strikingly resembling those in my specimen.

Prof. John Phillips, if my memory does not deceive me, informed me at the British Association meeting at Oxford, that he had seen Cycloid fish-scales in the Oxford Oolite. Accepting the above data,

* See Trans. Micros. Society, vol. iii. pl. 1, fig. 5.

I conceive it can no longer be affirmed that *Cycloid* fishes did not exist previously to the Cretaceous epoch.—Yours, &c.,

C. B. ROSE, F.G.S.

Great Yarmouth, June 14th, 1864.

We append the following note in reply, obligingly furnished by Mr. W. Davis.
EDIT.

Since Mr. Rose examined the slab in the British Museum (referred to in the above letter), another and a much better specimen has been acquired from the same locality, which, in addition to many scales in their natural position, exhibits portions of the jaws, with teeth having a *Sauroid* character.

As several species of true sauroid fishes, having similarly marked scales, occur in the Upper Oolite (Lithographic stone) of Solenhofen, it is probable that these imperfect specimens from our Kimmeridge Clay may prove to belong to a new genus of the same family.

Thrissops formosus and *Megalurus lepidotus* may be quoted as examples of *Ganoid* fishes having scales with *Cycloid* ornamentation. Agassiz describes the last-named species as having scales somewhat resembling those of the Carp, and gives an illustrative figure in pl. LI.^a vol. ii. of his 'Poissons Fossiles.' W. DAVIES.

CAN THERE BE A RAINLESS DISTRICT?

To the Editors of the GEOLOGICAL MAGAZINE.

IN the first article of your first number I hail the words 'a wholesome scepticism.' Is the scepticism of the title of this letter 'wholesome?' I consider a 'rainless district' to be an impossibility. In Professor Desor's article on the Sahara, the 'rainless district' is not mentioned. But water is mentioned in rivers, in pools above ground, and in 'sheets' below ground, and 'moist beds' at a depth of eight or ten metres. A 'rain of several days' is mentioned, and the 'Desert of Erosion' is described as the result of 'rain and rivers.' As a matter of fact, I would ask through the medium of your Journal, does rain fall on the Sahara, or does it not? I ask the same question with regard to Egypt. According to the 'Star' of February 22, 1857, the passengers by the 'Indus' reported 'a fall of snow at Cairo.' In May 1860 part of the railroad between Cairo and Suez was washed down by heavy rains, and the travellers from India were stopped for two days. To the north of this district, in the desert of El Tyh, Mr. Lowth ('Western Footsteps in Eastern Climes') gets frequently soaked with rain. He describes the whole surface as scored with channels of torrents tributary to the Wady Legaba and El Arish. In one of these channels he found a river rushing, twenty yards wide, and three or four feet deep. And he was obliged to wait, like the rustic, *dum defluat amnis*. Now, this is no accidental affair, for the El Arish is the *Torrents Ægypti*, and has therefore carried torrents across Arabia Petrea to the *Mediterranean* for at least 2,000 years. Again, in descending the El Araba to the Dead Sea, Mr. Lowth mentions 'marks of the rush of waters, long, deep, sharp cliffs in the ground, and water-worn stones and torn shrubs half uprooted in torrent-beds.' Now, Keith John-