

Herschelli, that it is specifically distinct from either of these spinose species of *Homalonoti*, and also from *H. elongatus*, as already stated.

I have, therefore, much pleasure in dedicating this new Devonian *Homalonotus* to the discoverer as *H. Champernownei*, sp. nov., from the Lincombe and Warberry Grits, New Cut, Torquay; which are probably the equivalent of the Hangman Grits and of the *Homalonotus* red flagstone of the Eifel.

V.—NOTICE OF NEW FISH REMAINS FROM THE BLACKBAND IRON-STONE OF BOROUGH LEE, NEAR EDINBURGH. NO. II.¹

By Dr. R. H. TRAQUAIR, F.R.S., F.G.S.

Cryphiolepis, gen. nov.

CRANIAL structure typically palæoniscoid, with wide gape and oblique suspensorium; teeth conical, sharp, incurved, of different sizes, larger alternating with smaller. Fins palæoniscoid, fulcrated; dorsal nearly opposite the interval between the ventrals and the anal; caudal powerfully heterocercal, deeply cleft, inequibate. Body-scales thin, rounded, but seldom symmetrically so, deeply imbricating; their external free or ganoid areae distinctly marked off, and sculptured with closely set ridges which are apparently tubular internally. Scales of the caudal body-prolongation of the usual palæoniscoid contour.

Cryphiolepis striatus, Traq.

Cœlacanthus striatus, Traq. GEOL. MAG. Jan. 1881.

A few weeks ago, I was somewhat startled by the discovery that the scales, to which in the GEOLOGICAL MAGAZINE for January of this year, I gave the name of *Cœlacanthus striatus*, belonged, not to a *Cœlacanthus* at all, but to a fish, in other respects, of typically Palæoniscid structure! The error was no doubt a serious one, but also one, which I think any one who looks at the detached scales,—thin, rounded, deeply imbricating, and delicately striated on their free surfaces, as they are,—will readily be disposed to excuse. As it is, our knowledge of the British Palæozoic fauna is enriched by the addition of a remarkably aberrant form of *Palæoniscidæ*, and one which shows not only how dangerous it may be to found conclusions on fragmentary remains, but also how small may be the systematic value of the mere external shapes of the scales of Ganoid Fishes.

The first specimen which opened my eyes to the true nature of the fish in question, was a fragment showing, attached to a mass of the scales of the supposed *Cœlacanthus*, a ventral and anal fin of distinctly Palæoniscid structure, along with a few rays of the caudal. Anteriorly is found a mandible, whose form, sculpture, and dentition at once throws light upon certain detached mandibles, which I had previously obtained, and supposed to belong to a new species of *Blonichthys*. The next specimen was more perfect, and showed the entire figure of the fish, with head and tail, and all the fins, save the pectoral, in a tolerably good state of preservation.

¹ For Part I. see GEOL. MAG. January, 1881, pp. 34–37.

This more perfect specimen measures altogether 5 inches in length by $2\frac{1}{4}$ in greatest depth at the ventral fins; the shape of the body is thus deep and ovoid, but the appearance of the head and the jumbled condition of the scales leave room for suspicion that its proportions may be somewhat shortened up by post-mortem distortion.

The bones of the head are not in a very good state of preservation, yet they show quite enough to prove in an unmistakeable way their typically palæoniscoid arrangement. The hyomandibular suspensorium is very oblique, the gape proportionably wide. The maxilla is in shape very like that of *Cosmoptychius striatus*, and like it has its broad portion marked with fine closely set ridges, mostly parallel with its upper and posterior margins. The mandible is here badly preserved, though the mouth is seen lying pretty widely open. Detached dentary bones in my collection are about an inch, sometimes a little more, in length; stout, and tapering anteriorly; the depth behind being $\frac{1}{3}$, and near the symphysis $\frac{1}{10}$ of entire length; the outer surface is ornamented with rather fine, closely set ridges, which are parallel with the lower but oblique to the upper margin of the bone; the upper margin itself is set at short intervals with stout, conical, pointed and incurved teeth, between which may be observed others of smaller size, and more externally placed. The opercular bones are ill preserved though evidently arranged in palæoniscid fashion; the clavicle is of the form prevalent in this family, and is externally ornamented with ridges, which are coarser than those of the facial bones.

The ventral fin, of considerable size and consisting of numerous closely set rays, is of the usual acuminate form; the dorsal is very imperfect, but its position is clearly seen to be nearly opposite the interval between the ventrals and the anal; the latter, though the extremities of its anterior rays are broken up, is evidently of the ordinary palæoniscid shape, triangular-acuminate and falling away rapidly behind. The rays of the lower lobe of the caudal are likewise broken up towards their extremities, and those of the upper have their joints altogether dislocated and jumbled, but the typically palæoniscid configuration of the fin is unmistakeable, being strongly heterocercal with well-preserved body-prolongation, deeply cleft and doubtless considerably inequibate. The rays of all the fins are numerous, closely set, and divided by transverse articulations, which leave the joints rather longer than broad; their outer surfaces are brilliantly ganoid, and ornamented by a few longitudinal grooves, which in the rays of the upper lobe of the caudal are numerous and close enough to form a regular striation.

The caudal body-prolongation is bordered above by a row of acutely pointed, strongly-striated V-scales; those clothing its sides also conform to the ordinary palæoniscid type, being minute, acutely lozenge-shaped, and externally nearly smooth, being ornamented only by one or two longitudinal grooves.

But, on the tail pedicle, and over all the rest of the body the scales are thin and of a rounded shape, though it must also be

observed that in few cases are they quite symmetrically rounded, there being usually more or less of a peculiar obliquity of form, which reminds us, to some small extent, of the rhombic contour of the ordinary palæoniscid scale. On their attached surfaces these scales are smooth, and perfectly destitute of the vertical keel, articular spine and socket found in ordinary *Palæoniscidæ* and in most other rhombic scaled Ganoids. The outer surface shows posteriorly a free ganoid and sculptured area, occupying about $\frac{1}{3}$ of the entire space, the remaining covered portion being dull and marked with very delicate concentric lines of growth. The exposed area is covered with fine, brilliantly ganoid ridges, raised above the general surface, closely set, subparallel, and proceeding to the posterior margin without convergence; they are frequently intercalated, but more rarely appear to bifurcate. When examined by a hand lens, these ridges, where the surface is abraded, appear to be hollow internally with only a very thin external covering, their tubular interiors being filled with white carbonate of lime, but I have not yet had the opportunity of subjecting the structure of the scales to examination by the compound microscope.

Remarks.—The occurrence of a palæoniscid fish with rounded imbricating scales, though new to British rocks, is not altogether new to science. Already in 1875 Prof. Anton Fritsch, of Prague, had discovered in the Lower Permian Gas Coal of Kounova, in Bohemia, a small fish he thus briefly noticed, —

“(Nov. gen.) *Kounoviensis*.—Ist eine neue Gattung von Fischen, die bei dem Gesammthabitus eines *Palæoniscus* mit Cycloiden-Schuppen versehen ist. Die Schwanzflosse ist heterocerc, die Kiefern mit grossen spitzen Zähnen versehen. Die Gesamtlänge beträgt 10 cm. Der Höhe nach sind 12 Schuppenreihen der Länge nach etwa 50.”¹ For this new and interesting genus Prof. Fritsch afterwards proposed the name *Sphærolepis*,² stating that the scales are “kreisrund,” but I am not aware of his having as yet published any full generic or specific diagnosis of the fish. Accordingly, with a view of ascertaining the generic relationship of the above described Carboniferous fish to the Bohemian *Sphærolepis*, I have carefully examined a specimen of the latter, which the British Museum obtained some years ago from Prof. Fritsch himself. Naturally, however, I feel great reluctance and delicacy as to entering into any detail as to Prof. Fritsch’s fish, before he has himself overtaken its complete description and illustration in his magnificent work on the Vertebrata of the Bohemian Permian Gas Coal and Limestones, now in course of publication. It will be quite sufficient to state that the symmetrical, and consequently more typically “cycloidal” contour of its scales, and the apparent absence of a sharply defined area with peculiar tubular ridges, together with other points, seem to me to be ample justification for erecting the Borough Lee fish into a separate genus. For this I propose the term *Cryphiolepis*, on account of the decep-

¹ Sitzungsberichte der k. böhm. Gesellsch. der Weiss, 19 March, 1875.

² *Ib.* Jan. 1877, also March, 1879.

tive appearance of the scales when found in an isolated, or detached condition.

Geological Position and Locality.—In the Blackband Ironstone of the Middle Carboniferous Limestone Series, worked at Borough Lee, near Edinburgh.

VI.—THE METAMORPHIC AND ASSOCIATED ROCKS SOUTH OF WEXFORD.

By C. CALLAWAY, M.A., D.Sc. Lond., F.G.S.

IRISH land, which has so long puzzled our statesmen, proves to be equally perplexing to our geologists. The metamorphic rocks have excited much controversy, and new problems are emerging. Prof. Hull¹ claims to have found Laurentians in Donegal, Galway, and intermediate localities, while Mr. Kinahan, in this *MAGAZINE*,² sums up the evidence for the old opinions. As I have recently studied one of the areas referred to by the latter, I submit a few comments on a part of his paper. I am much indebted to him for the very kind and courteous manner in which he abridged my work by indicating the most important sections, and regret that I must ungratefully repay the obligation by differing widely from his conclusions.

Mr. Kinahan utters a very just caution against attaching undue importance to lithological characters. Lithology must undoubtedly be subordinate to petrology. But the Archæan geologists are quite justified in accepting, with due precautions, the guidance of lithology, when petrology is not available.

The paragraph (p. 427) in Mr. Kinahan's paper which I venture to criticize runs thus:—"The rocks of the Carnsore or S.E. Wexford district I have very carefully worked out, and to me it appears that northward and westward they gradually merge into unmetamorphic rocks; and in the latter are found *Oldhamia*, a Cambrian fossil." These words call for special comment, because, as it appears to me, they express a fallacy of observation which has led to very erroneous conclusions. The argument mainly runs upon the words "gradually merge." I shall endeavour to show that the facts of the case can only be met by inserting "do not" before "gradually."

It has been frequently assumed that, if a metamorphic rock lies near unaltered beds whose age is determined by fossils, the former must be an altered portion of the latter series. The possibility that the two rocks were brought together by faults has not received due attention. In the Survey Map of Anglesey, as I have shown in this *MAGAZINE* and elsewhere, the same beds are in one place coloured "Cambrian" and in another "Silurian," simply because they were locally associated with those groups; whereas, on a closer examination, the junctions between the altered and unaltered series were invariably seen to be faults. I contend that the same oversight has vitiated the published work on the geology of Wexford.

The Survey Map of the Carnsore area represents three parallel

¹ British Association, 1881; and previously in *Nature*.

² September, 1881; also British Association, 1881.