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Notes

ON THE FISH FAUNA OF THE PENDLESIDE LIMESTONES.

BY EDGAR D. WELLBURN, L.R.C.P.E., F.R.I.P.H., F.G.S., ETC.

INTRODUCTION.

Since the appearance of the valuable and interesting memoirs of Dr. Wheelton Hind, F.G.S., a great interest in these limestones has been aroused in Yorkshire and elsewhere, and the author having worked in and collected a good number of fish remains from these rocks, considers that the Fish Fauna of the beds may prove of interest, especially as some of the fish are new to science, whilst the fauna as a whole is of importance as bearing on the question of the stratigraphical position of the rocks.

As a whole the fauna is very similar to that of the Millstone Grits* above, whereas it is very dissimilar to that of the Yoredales (Phillips) of North-west Yorkshire, but this is only mentioned here, as it is the intention of the writer to discuss this question at length later, when he hopes to adduce facts strongly supporting Dr. Hind's theory of the age and position of these limestones.

REMARKS ON THE FISH REMAINS.

FAMILY CLADODONTIDÆ.

GENUS CLADODUS

CLADODUS MIRABILIS Agassiz, 1843.

Several teeth† of this species have been found in the black limestones at Crimsworth Dean, near Hebden Bridge, Yorkshire.

CLADODUS sp.

The writer has found teeth of *Cladodus* in the Pendleside Limestones at Astbury, near Congleton, Cheshire, and others have occurred

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* Wellburn, Geol. Mag., Dec. IV., Vol. VIII., No. 443, p. 216, 1901.

† Wellburn, Proc. Yorks. Geol. and Polytec. Soc., 1901, p. 175.

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in a band of crushed limestone at Burnside and Thorpe Fell, Yorkshire, but unfortunately not in such a condition as to render the determination of species at all certain.

FAMILY CESTRACIONTIDÆ.

GENUS ORODUS.

ORODUS ELONGATUS Davis (ex Agassiz M.S.), 1883.

Several teeth* have occurred in the limestones at Crimsworth Dean, near Hebden Bridge, Yorkshire, and the writer has also found them in the limestones at Astbury, near Congleton, Cheshire.

FAMILY ACANTHODIDÆ.

GENUS ACANTHODES.

ACANTHODES sp.

The writer has found specimens of *Acanthodes* in the limestones at Astbury, near Congleton, Cheshire, and also at Pule Hill, near Marsden, Yorkshire, but the state of preservation of the specimens was not such as to render the determination of species at all certain.

FAMILY DIPLACANTHIDÆ.

GENUS MARSDENIUS gen. nov.

Generic characters :—Body fusiform, laterally compressed. Fins, especially the caudal, well developed. Teeth in the form of broad based blunt cones, confluent at the base. Clavicular bones strongly developed. Fin spines robust, the pectoral one being much elongated, remaining ones broad, robust, and ornamented with well-marked longitudinal ridges; two dorsal fin spines, the posterior being longer than the anterior. Several scutes, or free spines, on the ventral aspect. Scales minute.

NOTE.—The writer has long had specimens of this genus in his cabinets, but a detailed description has only now been rendered possible by recent finds. The name is taken from the locality where the type was found, viz., Marsden, Yorkshire.

Type: Author's col.

Locality: Pule Hill, near Marsden, Yorkshire.

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* Wellburn, op. cit.

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MARSDENIUS SUMMITI, sp. nov.

Type: Imperfect fish, author's col.

The best specimen (the type) is in a limestone nodule. It shows a fish of about 10 cms. in length; the caudal and ventral regions are well shown, but the head being crushed back on to the dorsal region this portion of the fish is not so well shown. The body is fusiform and laterally compressed. Of the fins, the caudal is strongly developed, the lobes being prominent and well marked; the pectoral, ventral, and anal fins are fairly well seen and appear to have been well developed. The dorsal fins are not seen here, but another specimen which shows their fin spines points to the fact that the posterior fin was the larger of the two. All the fins are covered with scales similar to those on the body, but smaller, and, with the exception of the caudal, all are provided with spines. In position the anal fin is close to the caudal, the ventral being about one-third nearer the pectoral than the anal. The pectoral fin spine is the largest and most elongated; the ventral spine is about half the length of the pectoral; the anal rather smaller than the ventral; the posterior dorsal about the size of the ventral; whilst the anterior dorsal spine is only about half the size of the posterior. On the ventral surface of the fish are several very small recurved free spines. The pectoral spine appears to have been smooth, with the exception of a single groove which runs parallel with its anterior border. The spine is slightly curved; the remainder of the spines are straight, robust, and ornamented with well-marked longitudinal ridges, which have the following arrangement:—The anterior one or two are more strongly marked than the others, and run parallel to the anterior border, whilst the more posterior ridges run longitudinally in a somewhat irregular manner, gradually converging towards the more strongly marked anterior ones. The body is covered with scales, which are very minute, and the superficial ornamental layer having been most removed, the scales mostly appear smooth, but here and there the sculpture can be seen by the aid of a powerful lens. It is as follows:—On the principal flank the scales are sculptured with deep grooves which traverse the scale in an anterior-posterior direction, parallel with the superior and inferior borders, the scale

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surface being divided into a number of wide rounded ridges, and the grooves cutting deeply into the posterior margin gives it a scalloped appearance. On the posterior flank the scales appear to have been smooth. The head bones are not well seen in any specimen, but what evidence there is shows that they were of the ordinary *Acanthodian* type. The bones of the shoulder girdle were strongly developed, and are very similar in form to those of *Parixius*.

Form and Loc.: Pendleside Limestones, Pule Hill, near Marsden, Yorkshire.

MARSDENIUS ACUTA sp. nov.

Type: Portion of fish, author's col.

There are several specimens of this fish in the author's cabinets. They show the same general characters as the last of the type species, but a much smaller fish is indicated; the type specimen would point to a fish of about 7 cms. in length. The fish differs, however, from the last species in the character and ornamentation of its fin spines, and also the sculpture of its scales. The pectoral fin spines are more elongated and slender; they gradually taper to a fine point, and have a groove and ridge running parallel to the anterior border. The other spines are similar to those of the last species, with the exception that the ridges which sculpture the spines are relatively much finer and more numerous and run in a more irregular manner. The clavicular bones are very strongly developed, and one specimen in the author's collection is of great interest, as it shows the form and characters of the mandible, with its dentition. The mandible is very similar in its general characters to that of the fish *Acanthodopsis Wardi* Egerton of the Coal Measures. The dentition consists of well-marked, blunt, broad, low cones, confluent at their bases. The scales are very minute, and here and there a scale sculpture of very fine transverse striæ may be made out by the aid of a powerful lens.

The name "*acuta*" is given to the fish on account of the pointed character of its pectoral fin spines.

Form and Loc.: Pendleside Limestones, Pule Hill, near Marsden, Yorkshire.

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MARSDENIUS sp. ?

The author has collected and seen specimens of this genus, but unfortunately not in such a condition as to render the determination of species at all certain, from the Pendleside Limestones of the following localities, viz.:—Pule Hill, Marsden, Yorkshire; Dane Valley, Staffs, (half a mile above the bridge, and immediately below the Kinderscout bed of the Millstone Grits).

Remarks:—The above specimens, in certain characters, appear to indicate that the species is new, but the writer deems it better to wait for more perfect specimens.

Remarks on the genus *Marsdenius*:—From the foregoing remarks it will be seen that the conformation of the mandible and the character and arrangement of the teeth, and also that of the pectoral fin spines of *Marsdenius* is very similar to that of *Acanthodopsis Wardi* Egerton of the Coal Measures, whereas, on the other hand, the general characters and arrangement of the fin spines as a whole, and the great and characteristic development of the clavicular bones, also the seutes or ventral free spines, strongly ally the fish to many of the Diplacanthidæ, and this being so the author has ventured to place the genus in that family.

FAMILY RHIZODONTIDÆ.

GENUS RHIZODOPSIS Young, 1866.

RHIZODOPSIS SAUROIDES Williamson, 1837.

There are several fragmentary specimens of this fish in the collections of Mr. Barns, F.G.S., Higher Broughton, Manchester, and also in that of the author.

Loc.: Pule Hill, Marsden, Yorkshire.

GENUS STREPSODUS Young, 1866.

STREPSODUS SAUROIDES Binney sp., 1841.

Fragmentary remains in the collections of Mr. Barns and the author.

Loc.: Pule Hill, Marsden, Yorkshire.

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FAMILY COELACANTHIDÆ.

GENUS COELACANTHUS Agassiz, 1844.

COELACANTHUS HINDI sp. nov.

Type : Portion of fish, author's col.

The specimen shows several of the bones of the head and the anterior portion of the body. Of the head bones most are seen from the inner surface, but they appear to have been ornamented with ridges, which run more or less parallel to the borders of the bones. On the operculum—which is half as high as broad—there is an indication of faint, more irregular ridges and granulation between the principal ridges, whilst on the jugular plates the ridges appear to have run in a fairly regular manner. The latter element (jugular) gradually tapers anteriorly to a fine point. Behind the operculum are a number of long slender rays, which are probably the remains of the pectoral fin. Further back are a number of neural spines, which show the usual characters of *Coelacanthus*. Well-marked and characteristic branchio-stegal rays (detached) are also shown. The body is covered with large, much rounded scales, the posterior or exposed portion of which is ornamented in a highly characteristic manner, with strongly marked ganoine coated ridges, which run in a very regular manner in half circles parallel to the rounded posterior border.

Remarks :—The form and very striking ornamentation of the scales are so dissimilar to that of any known coelacanth that I treat the fish as new, and propose the specific name *Hindi*, after Dr. Wheelton Hind, F.G.S., of Stoke-on-Trent, on account of the very valuable work which he has accomplished in respect to the Pendleside Limestones. Mr. J. Ward, F.G.S., who has seen the specimen, also regards it as new.

Loc.: Bank of River Hamps, near Waterhouses, Staffs.

FAMILY PALÆONISCIDÆ.

GENUS ELONICHTHYS Giebel, 1848.

ELONICHTHYS OBLIQUUS Wellburn

There are many more or less imperfect specimens of this fish in the author's collection, but as the type was found in the Mill-

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stone Grits, he purposes to describe it later, along with some other new fishes from these rocks.

Loc.: Pule Hill, near Marsden, and Todmorden, both in Yorkshire.

ELONICHTHYS AITKENI Traquair.

Fragmentary remains of this fish have been found in the following localities :—Pule Hill and Crimsworth Dean, both Yorkshire.

ELONICHTHYS sp. ?

One nodule in the author's collection shows a mass of scales of a small *Palæoniscid* fish which, from the general characters of the scales, should be placed in this genus, but on account of the small size of scales it is very difficult to make out their sculpture, and so to say anything definite about the species. By the aid of a powerful lens the following ornamentation may be made out on some of the larger flank scales, viz.: There are many closely-arranged fine ridges or striæ which, commencing at the superior border, run down the scale parallel to the anterior border, then turning above the anterior inferior angle, they sweep across the scale towards the posterior border, which is entire. Some of the smaller, presumably posterior flank scales, are smooth.

Remarks.—The scale sculpture appears to differ from that of any known species, but it seems to be better to defer the determination of species until later, in the hope that better specimens may be found.

Loc. : Pule Hill, Marsden, Yorkshire.

GENUS RHADINICHTHYS.

Some small, more or less smooth, scales I place in this genus from their general resemblance to the smoother scales of the fish RHADINICHTHYS MONENSES Egerton.

Loc.: Dane Valley, Staffs.

GENUS ACROLEPIS.

ACROLEPIS HOPKINSI McCoy.

Fragmentary remains.

Loc.: Crimsworth Dean and Pule Hill, Yorkshire ; Dane Valley, Staffs.

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FAMILY PLATYSOMIDÆ.

GENUS PLATYSOMUS.

The writer has in his collection a scale which he found in a limestone nodule at Whitewell, near Clitheroe, which certainly belongs to the above genus. The scale is high, narrow, with a well-developed articular peg; in fact, in general form and characters it very closely resembles many of the upper and lower flank scales of *Platysomus fosteri* Handk. and Attney, of the Coal Measures. The sculpture consists of fine, regular, closely-arranged, oblique ridges.

I cannot conclude without expressing my thanks to Dr. Wheelton Hind, F.G.S., and Mr. Barns, F.G.S., for having granted me the privilege of examining the specimens in their collections.