V.—*On a Specimen of ACANTHODES WARDII, Egerton, from the
Lanarkshire Coal Field.* By JAMES THOMSON, F.G.S.

PLATE IV.

(Read November 3, 1870.)

FOR a number of years I have frequently found small, curved spines, grooved parallel to the plane of the anterior face, embedded in the carbonaceous shales that overlie the Palace Craig black-band ironstone in the neighbourhood of Airdrie, and also in the roof of the splint coal at Newmains, Wishaw, and Newton, near Cambuslang. As they had not been found associated with other parts of the fish, I felt unable to establish their generic or specific characters. Associated with these were found small scales, confusedly scattered over the slabs of shale. In form they are rhomboidal, smooth, and much raised in the centre. Associated with these were portions of what appeared to be shagreen.

The doubts surrounding these interesting forms were happily dispelled by the discovery, in the spring of this year, of a portion of a tolerably-well-preserved specimen of *Acanthodes*, with the ventral, anal, and a part of the dorsal spine, in position, contained in a slab of the Palace Craig ironstone. The specimen measures, from near the extremity of the caudal fin to an inch beyond the ventral spine, fully fifteen inches.

Through the kindness of Mr. John Ward, Longton, Staffordshire, who forwarded me a specimen of *Acanthodes Wardii*, I was enabled to compare my specimen with it; and finding it agreed in every detail with that species, except in the size,* I had no difficulty in recognising in the Lanarkshire specimen both the generic and specific characters of that species.

The structural characters of this fish have been so ably described by Sir Philip Egerton that it is unnecessary to do more than give a few of the details exhibited in our specimen. The length, as before stated, is fully fifteen inches. The slab is broken about an inch

* In a note lately received, Mr. Ward informs me that he has lately discovered a portion of a large *Acanthodes*, which he believes to be *A. Wardii*.

beyond the ventral ray, consequently the anterior part of the body and the head are wanting. It is divided into the following proportions:—From the point where the spine of the ventral fin is inserted into the body to the base of the anal spine, six inches; from the base of the anal spine to where the vertebral axis bends upwards to the upper lobe of the tail, six inches; and from the point where this axis bends upwards to the broken portion of the tail, two inches.

The dorsal spine is situated above, and an inch behind the anal fin, and is two and a half inches long. Its outline is acutely triangular, and it is grooved on each side parallel to the anterior face, and obscurely grooved at the base where it is seen to enter the body of the fish. It supports a large and somewhat triangular fin, which passes to near the apex of the spine.

The anal spine is somewhat stouter than the dorsal, and is $2\frac{3}{4}$ inches long. It supports an unequally lobed triangular fin, one side of which extends along the body of the fish towards the tail. At the base, and behind the spine, are a number of minute rays, about a line and a half long, which are seen to connect the fin to the body.

The ventral spine, as above stated, is situated six inches before the anal. It is, however, only a fragment, and is broken about half an inch from its base. Faint traces only of the fin remain, obscurely seen, passing to half the distance in front of the anal spine; but it is not sufficiently preserved to enable me to determine either its form or extent. In a specimen which Mr. D. J. Brown, of Edinburgh, kindly sent me from the Wallieford coal field, Midlothian, the fin is seen to pass to near the base of the anal spine. All the spines are slightly hollowed along the posterior face where the fins have been attached. The tail is heterocercal. I am not aware how far the upper lobe extends, it being broken; but if I may judge from the proportions of the specimen referred to above, it would extend, at least, fully two inches longer than the point indicated in the plate.

The inferior lobe is well preserved. At its base are seen well-defined fin rays, which diminish in size as they ascend along the upper margin of the lower lobe.

The dermal investiture consists of rhomboidal ganoin scales, raised in the centre into somewhat circular eminences. (See Fig. 1 a.)

Geological position.—Upper coal measures in shale above the

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Palace Craig and Airdrie blackband ironstone, and shale above the splint coal, at Newmains, Wishaw, and Newton, Cambuslang.

EXPLANATION OF PLATE.

PLATE IV.

Fig. 1.—*Acanthodes Wardii*, Egerton, reduced in length two inches.

„ 1 *a*, Part of rhomboidal scales magnified.

„ 2.—Dorsal spine.

„ 3.—Anal spine.

„ 4.—Ventral spine.

VI.—On CTENACANTHUS HYBODOIDES, *Egerton*.

By JAMES THOMSON, F.G.S.

PLATES II., III.

(Read December 2, 1869.)

MANY of the spines found in carboniferous strata have been enshrouded in so much obscurity, that any observation which will contribute to their proper classification is of importance to the palæontologist.

The form and structure of the spines of *Ctenacanthus* have been described by Professor Agassiz ; but I am not aware that the spines of the species which forms the subject of this communication have been described as constantly or intimately associated with other head-parts, such as might suggest the particular animal to which they belonged. Teeth and spines have received distinct generic names. Our information not sufficing to determine the spines and teeth which belonged to the same animal, I propose to attempt such a determination in the case of *Ctenacanthus hybodoides*.

In the spring of 1869 I was fortunate in obtaining a slab of the Palace Craig ironstone from Carnbroe, near Airdrie, which contained, 1st, a mass of shagreen ; 2nd, two spines of *Ctenacanthus hybodoides** (Plate II., fig. 1, 1 *a*, and 1 *b*) ; 3rd, a number of the teeth *Cladodus mirabilis* (Plate III., fig. 1), all evidently in their proper relative positions, the slightly curved lines in which they are disposed suggesting the contour of the mouth ; and, lying at a higher level than these, there is exposed, 4th, a fragment of a small spine, the cross section of which gives in outline an oblong

* Described as *C. magnus* in Brit. Assoc. Report, 1869.