

ON *BELINURUS KILTORKENSIS*, BAILY.

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IN 1899 Messrs. Rupert Jones and Henry Woodward¹ stated that *Belinurus* "has not at present been found in rocks of earlier age than the Coal-measures." *Belinurus grandævus*, described in the same paper, was referred, with probability, to the Lower Carboniferous. A writer ("R. W. E.") in the *Ottawa Naturalist*² for January, 1900, thereupon called attention to the record of *Belinurus* from the Kiltorcan Beds of Ireland. This record is founded on Mr. W. H. Baily's discovery³ of "a well-marked head (or carapace), to which is attached portions of two of the thoracic segments." Dr. Henry Woodward,⁴ in 1878, accepted this determination, on the basis of sketches furnished to him by Mr. Baily, who had by this time discovered a second, though distorted, specimen. The Kiltorcan Beds, it may be remarked, are of Upper Old Red Sandstone age, and are part of the 'Yellow Sandstone Series,' which passes conformably up into the Lower Carboniferous Shale. They are not, therefore, of such high antiquity as the writer in the *Ottawa Naturalist* suggests.



FIG. 1.—Sketch of the less imperfect specimen of *Belinurus kiltorkensis*, Baily, showing the principal features visible with a platyscopic lens. Natural size. The carapace is viewed from the under side.

FIG. 2.—Sketch of the distorted specimen, viewed from the upper side with the aid of a platyscopic lens. Natural size. The details of the central portion are best seen in this example, though the whole is greatly broadened.

The question having thus been raised, I obtained the permission of the Director-General of the Geological Survey to examine the specimens preserved in the collections in the Dublin Museum. Mr. Baily's specimens have, at some later time, been relabelled as 'Limuloides'; but the carapace is certainly not of the hemiaspid type. It presents the continuous unnotched margin shown in Mr. Baily's original drawing. The better specimen is, I feel confident, presented to us from the under side, and shows more

¹ "Contributions to Fossil Crustacea": *Geol. Mag.*, 1899, p. 389.

² Quoted in *Geol. Mag.*, 1900, p. 177.

³ "On Fossils obtained at Kiltorcan Quarry, Co. Kilkenny": *Report Brit. Assoc.* for 1869, p. 75.

⁴ "British Fossil Crustacea" (*Palæontographical Society*), p. 238.

detail than has hitherto been attributed to it. The flat border, 1mm. wide, is followed by a smoothly curving region, from which the protuberances rise which correspond in part to the glabella in the trilobites. The form of these is best seen from the annexed sketches, which, like Mr. Baily's, have been made from the original specimens. The distorted example is seen both as an external cast and in relief, and the four elevated portions stand out distinctly on it. They seem to have been highest at their margins, a rim thus occurring about a depressed area on each. This feature is also seen in Mr. Griesbach's drawings of the better known species of *Belinurus*.¹

The eyes indicated by Baily are based on a thickening that occurs on the edge of the 'glabella,' where it descends to meet the smoother lateral area. The evidence is slight, but agrees with what is already known of *Belinurus*.

There are indications of radial ribbings on either side of the 'glabella,' like those that have been attributed to impressions of the limuloid limbs.

The 'pleuræ' (if we may use the nomenclature adopted in the case of trilobites, with which these forms provide so valuable a link) are furrowed, while in *Hemiaspis* (*Limuloides*) they are unfurrowed. Traces of three segments are preserved in the more perfect specimen. Even the somewhat abrupt posterior bend, so characteristic of the pleuræ of *Belinurus reginæ*, is noticeable in the first segment of *Belinurus kiltorkensis*, and was doubtless repeated in the others.

Protolimulus (*Prestwichia*) *eriensis*, described from the Devonian of Pennsylvania by H. S. Williams and A. S. Packard,² is only known by its under surface; but the cephalic shield does not resemble that of the Kiltorkan specimens.

I feel, then, that *Belinurus* may safely be regarded as occurring in the Upper Old Red Sandstone of Ireland, which some authors have proposed to include in the Lower Carboniferous Series. There seems no reason to depart from the determination made by Mr. Baily and Dr. Woodward thirty years ago, a determination that has become widely known through the works of Zittel and other palæontologists.

¹ "Brit. Foss. Crust." (Pal. Soc.), pl. xxxi.

² Packard, "Carboniferous Xiphosurous Fauna of North America": Mem. Nat. Acad. Sci. Washington, vol. iii (1886), p. 150.