

TWO DEFORMED ICHTHYOSAUR FORELIMBS FROM THE ENGLISH LOWER LIAS

by

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Summary

An account is given of two remarkably similar instances of pathological deformation in ichthyosaur forelimbs from the Lower Lias of Nottinghamshire and Somerset, of a character not apparently recorded elsewhere in the literature. The possible effect on the performances of the individuals concerned is also briefly discussed.

Introduction

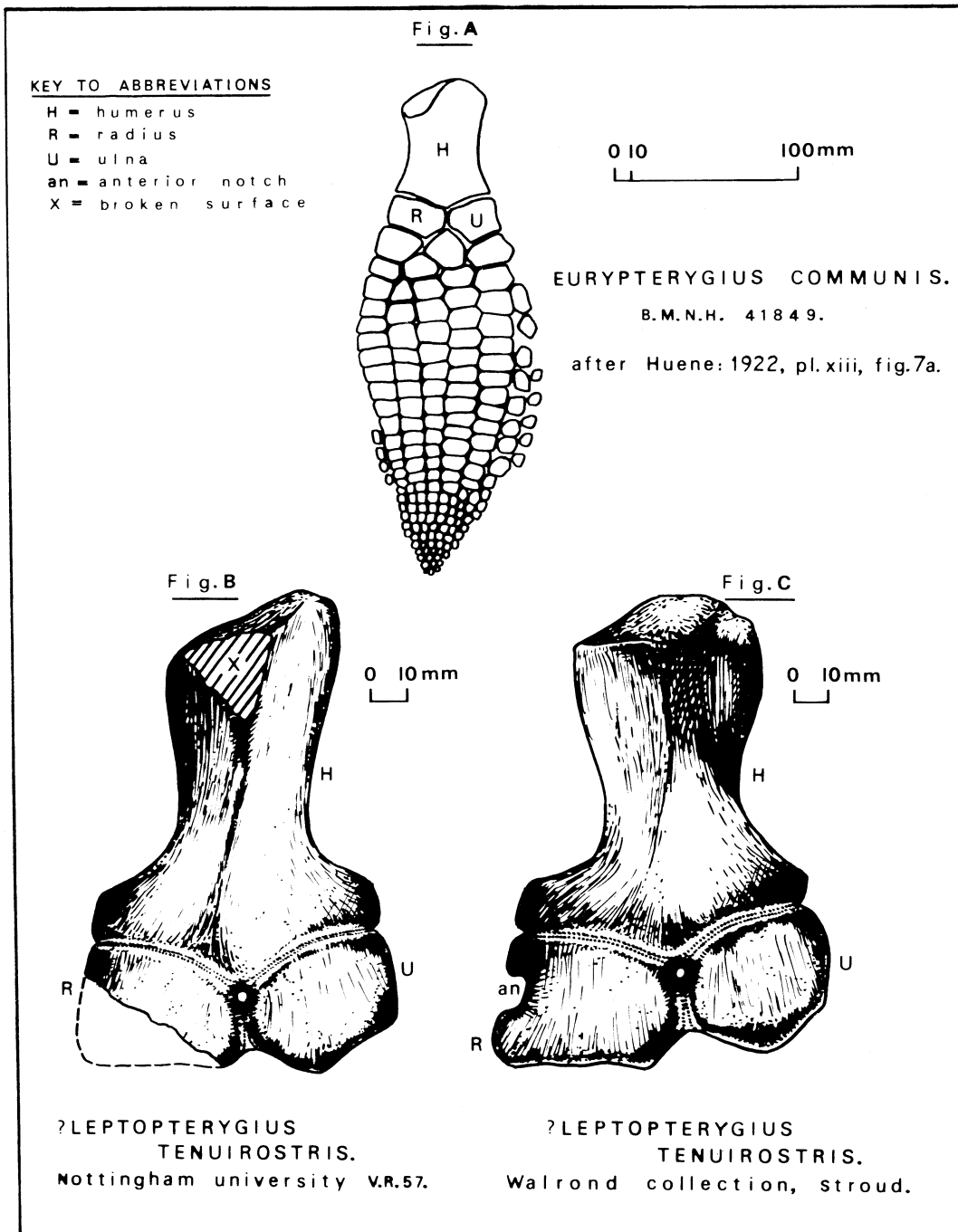
Ichthyosaurs, whose bony remains abound at certain Mesozoic horizons, were secondarily aquatic marine reptiles in which the limbs had become highly modified (text-fig.1, fig. A). Although superficially resembling paddles or flippers, these limbs functioned primarily as steering or stabilizing fins. Despite their flexibility, ichthyosaur limbs must, as protrusive organs, inevitably have been prone to occasional rough contact with various natural obstacles, rocks and driftwood, and with their other marine contemporaries, plesiosaurs, pliosaurs, marine crocodiles, and other ichthyosaurs, and from time to time sustained injury, permanent or otherwise, and subsequent pathological deformation. It is, therefore, somewhat curious that no references to damaged or deformed ichthyosaur forelimbs occur in the literature, especially as specimens exhibiting deformations of this kind do exist in palaeontological collections. The present paper records two such specimens from the English Lower Lias.

Description of Specimens

The first specimen described (text-fig.1, fig. B), no. VR 57 in the collection of the Geological Department of Nottingham University, came from bed 3.S at Barnstone, Nottinghamshire (Kent 1937, p.165). According to information received from Sir Peter Kent, who actually collected this specimen, 3.S refers to a shale bed below limestone 3, counting from the bottom of the quarry upwards, and is the shale underlying the "Mucky Rummels" [Bed 6, table p.165]. The horizon is in the *Pre-Planorbis* Beds, about 8½ feet above the base of the Lias. The exact locality was the Barnstone Cement Company's pit, 1 mile west of Barnstone Church (SK 736356). The Hydraulic Limestones of the Lower Lias were formerly worked in this pit on an extensive scale, and have long yielded reptilian bones (Lamplugh *et al.*, 1908, p.59; Kent, 1937, pp.164-5).

The specimen consists of a slightly abraded humerus and the associated radius and ulna of a moderately sized right limb. The radius, however, lacks much of its anterior and distal borders, so that it is unknown whether the anterior margin once possessed the anterior notch which is a feature of several English and many Continental liassic ichthyosaurs. Such evidence would have been of some assistance in helping to identify the specimen generically. The general proportions of the humerus, however, indicate that a longipinnate ichthyosaur is represented. The only species of that group certainly known from the *Psiloceras planorbis* Zone is *Leptopterygius tenuirostris*, to which the specimen is here tentatively referred.

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1 text-fig.



Text-fig. 1. Normal, fig. A, and deformed, figs. B and C, Ichthyosaur forelimbs.

The humerus is completely ossified with the radius and ulna distally, and both the two latter bones almost wholly so one with another. Indeed, only a small subcircular aperture, totally surrounded by continuous bony growth, survives where all three bones originally articulated. Only faint outlines of the original margin of these bones are now visible. The ossification is of uniform thickness and texture, its cancellous structure being clearly discernible. The unaltered character of the distal articulating surfaces of the radius and ulna, however, indicates that ossification affected only the three bones under consideration.

Except for its somewhat larger size, the second specimen (text-fig.1, fig.C) closely resembles the Barnstone fossil just discussed, and, again, belongs to a right limb. Now in the collection of Mr. Lionel Walrond, of Stroud, Gloucestershire, it was found in a pale buff-coloured shale bed in the *Pre-Planorbis* Beds of the Lower Lias in an old quarry adjacent to Tengrove Lane, near Upton, Somersetshire (ST 457268). In this specimen, however, the anterior border of the radius is complete, and exhibits a well-defined notch. The presence of this feature and the general proportions of the humerus again suggest that the specimen is best referred to *Leptopterygius tenuirostris*.

As in the Barnstone specimen, the humerus is ossified distally with the radius and ulna, and the two latter bones mostly so one with the other. Again, only a small subcircular aperture, completely surrounded by ossified material, occurs where these three bones once articulated, only faint outlines of their original margins now being visible. The persistence of this aperture in both specimens is of unknown significance. The ossified material is again of uniform thickness and texture, its cancellous structure being traceable throughout its extent, and seems, as in the Barnstone fossil, to have been wholly confined to the humerus, radius and ulna.

Discussion

The restriction, in both specimens of the ossified material suggests that the "wrist" or carpal areas of the limbs had been damaged or temporarily dislocated during life, and in precisely those areas in forelimbs most susceptible to injury. It would appear that virtually identical damage had been sustained by both limbs, so that the tissues interposed during life between the relevant bones had become damaged or diseased through injury, and had subsequently failed to regenerate sufficiently to prevent ossification of the affected bones. Once ossification had been effected, the flexibility and functional use of these limbs must have been considerably diminished, and the performance of these individuals perhaps seriously impaired.

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