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A NEW XIPHOSURAN FROM THE TRIASSIC SEDIMENTS AT BROOKVALE, NEW SOUTH WALES.

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(Plate xiii.)

Amongst the many interesting fossils obtained from the shale beds at Brookvale is an almost complete specimen of a Xiphosuran. These Brookvale sediments are generally considered to be of freshwater origin. They contain insects as well as fish, *Estheria* and *Leaia*. As Xiphosura occur in both freshwater and marine sediments this specimen throws no light on the probable nature of the sediments.

The Xiphosuran shows many interesting features, the species being considered in a new genus for which a new family is erected.

Order Xiphosura.

Family Austrolimulidae, nov.

Similar to Limulidae but with the caudal three segments of the opisthosoma distinct and not consolidated.

In the only known species the opisthosoma is not produced laterally into spines and the very large genal spines are directed laterally.

Genus **Austrolimulus,** gen. nov.

Genotype **Austrolimulus fletcheri,** sp. nov.

Differing from recent *Limulus* in the structure of the opisthosoma and less so of the prosoma. Opisthosoma divided into two regions, the anterior three segments consolidated and tapering markedly caudally, the posterior three segments distinct but anchylosed and of almost equal width; segments of the opisthosoma without lateral spines or projections, except that the caudal segment is bluntly produced postero-laterally; caudal spine longer than body; postero-lateral margins of prosoma (genal area) produced laterally into very long spines.

The genus would seem to occupy a position intermediate between Belinuridae and Limulidae as, in the former family all the segments of the opisthosoma are distinct, though often anchylosed, whereas in the latter they are all consolidated.

Austrolimulus fletcheri, sp. nov.

The specimen is preserved as external and internal moulds of the dorsal surfaces of the prosoma and anterior three segments of the opisthosoma and as ventral views and moulds of the ventral surface of the caudal three segments of the opisthosoma, caudal spine and the "free cheeks" which are produced into long, laterally directed genal spines.

Prosoma wider than long (excluding the genal spines); dorsal surface not clearly preserved, more distinct on the internal mould; divided into three subequal areas by a somewhat raised carina running slightly postero-laterally to the highest point which possibly represents the spine above the eye, and then postero-mesally to the junction of the pleural groove of the opisthosoma; eye, if correctly interpreted, at the junction of the middle and caudal thirds of the prosoma; median third of prosoma divided into narrow "glabella" region, about one-quarter of the width of this portion,

and the two "fixed cheeks"; lateral margins of the glabella irregular or lobed with apparently a median spine anteriorly; the fixed cheeks rather finely, irregularly tuberculate; free cheek divided into two regions, a narrow marginal zone which postero-laterally is produced into the very pronounced genal spine directed laterally and an inner zone between this and the fixed cheek; inner zone coarsely, irregularly tuberculate; marginal zone smooth, gradually narrowing anteriorly; genal spine all lying anterior to the caudal margin of the prosoma, its surface ornamented at base both anteriorly and posteriorly (particularly) with short irregular transverse rugae, towards apex with fine ornamentation, at least ventrally towards apex with a median longitudinal carina and dorsally towards apex apparently with a pair of finer carinae, at base with two diverging, more or less transverse carinae; caudal margin of prosoma forming a three-sided re-entrant angle; genal spine almost as long as the width of body of prosoma.

Opisthosoma divisible into two regions, an anterior region of three consolidated segments and a caudal region of three distinct segments; anterior three segments tapering markedly posteriorly; caudal three segments of about equal width; antero-lateral free lobe distinct, not extending laterally beyond the outer limit of the caudal re-entrant of the prosoma, the lobe lying in a different plane from the rest of the opisthosoma; segments of the opisthosoma without lateral spines, caudal segment bluntly pointed postero-laterally; ventral surface of caudal three segments with sutures distinct, surface convex, roughly rugulose; anterior three segments rather finely, irregularly tuberculate dorsally; central axis of opisthosoma distinct, anteriorly of similar width to the glabella but tapering over the caudal segments; pleura with a transverse sulcus at about their middle, together forming a longitudinal sulcus converging caudally; caudal three segments together a little shorter than the anterior three.

Telson drawn out into a long caudal spine; spine at least one and a half times the length of body, distinctly longer than prosoma is wide (excluding genal spines); spine triangular in section, apparently similar to that in recent *Limulus*.

Size.—Length, including caudal spine, $5\frac{3}{4}$ inches; prosoma plus opisthosoma $2\frac{1}{4}$ inches; width including genal spines 7 inches; genal spine $2\frac{1}{4}$ inches.

Type.—Holotype F.38274, and counterpart F.38275, in the Australian Museum, Sydney.

Type Locality and Horizon.—Beacon Hill shales about mid-way in the Hawkesbury Series, Middle Triassic, at Brookvale, near Sydney, New South Wales.

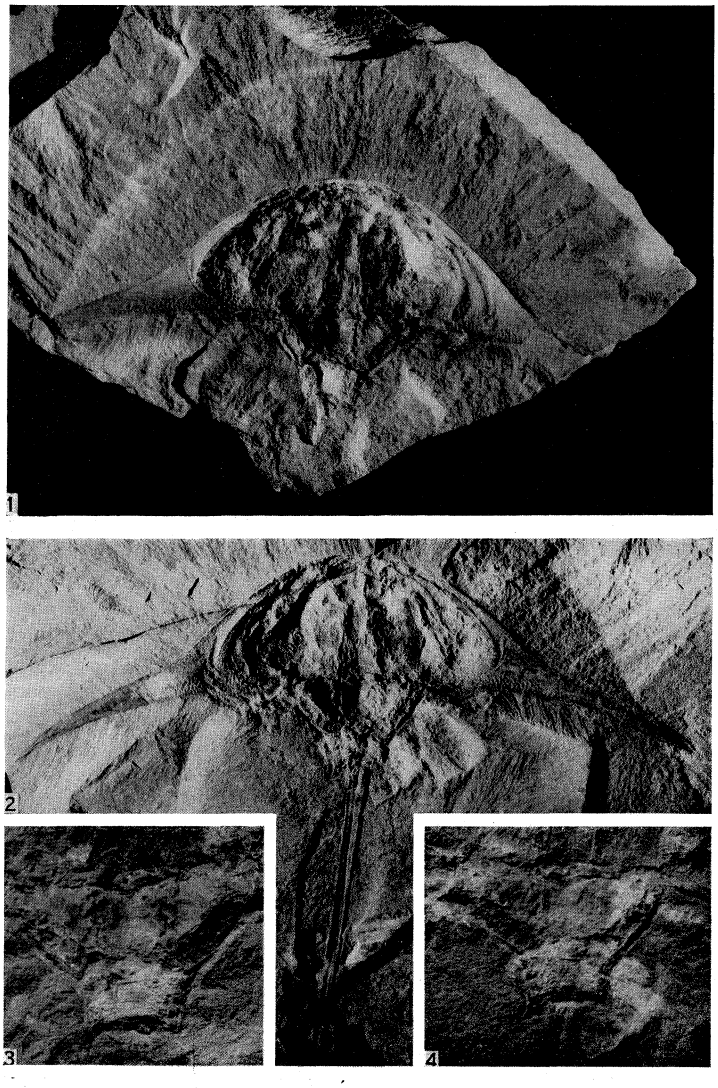
Only the holotype specimen is known.

This most interesting species is named for Mr. H. O. Fletcher, paleontologist at the Australian Museum, who has always been most helpful to the author in his studies on fossil arthropods. The figures of the plate were prepared by Mr. Howard Hughes of the Australian Museum, who continues to do excellent work in this field.

Explanation of Plate XIII.

Figures 1-4.—*Austrolimulus fletcheri*, gen. et sp. nov.

1. Counterpart of holotype x $\frac{1}{2}$.
2. Holotype x $\frac{1}{2}$.
3. Opisthosoma of counterpart showing the segmentation of the caudal segments (reversed lighting). x slightly more than 2/3.
4. Opisthosoma of holotype showing the segmentation of the caudal segments. x slightly more than 2/3.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