OCCURRENCE OF *AUSTRALOSUTURA* (TRILOBITA) IN THE MISSISSIPPIAN OF OKLAHOMA, U.S.A.

by ALLEN R. ORMISTON

ABSTRACT. A species of *Australosutura* is described from Mississippian rocks of Oklahoma regarded as being Viséan in age. It is most like the earlier-described Australian species, less like that from Argentina.

A TRILOBITE collected by Dr. Kenneth W. Ciriacks in the course of his investigation of the Moorefield Formation of Oklahoma was identified by me as *Australosutura*. In the company of Dr. Ciriacks I visited the locality from which the original specimen came and was able to collect additional material. These Oklahoma specimens are the first of the genus in North America.

So far as the writer is aware, *Australosutura* has previously been known to occur only in Australia and Argentina. Amos, Campbell, and Goldring (1960, p. 229) erected the genus for the single species *Cordania gardneri* Mitchell 1922, originally described from the Carboniferous of Australia. *A. gardneri* was recognized by them in collections from Argentina as well as from Australia. Another Australian occurrence of the genus was reported by Campbell and Engel (1963, p. 110).

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Stratigraphy. The north-eastern Oklahoma exposures of the Mississippian Moorefield Formation were divided by Huffman (1958, p. 49) into four members which are in ascending order: the Tahlequah, Bayou Manard, Lindsey Bridge, and Ordnance Plant Members. All the specimens of *Australosutura* described in this paper come from a 6-in. bed 8·7 to 9·2 ft. below the top of the Bayou Manard Member exposed in the bed of a dry stream 0·5 miles south of Welling, Oklahoma (exact locality information below). At this locality the Moorefield Formation is incompletely exposed; the lowest beds being within the Bayou Manard Member. Approximately 30 miles north-west of the Welling locality there is a complete exposure of the Moorefield Formation at Lindsey Bridge. There the entire formation is 107 ft. thick and the Bayou Manard Member 53 ft. thick. Although the Welling exposure is incomplete, the Bayou Manard Member appears to be considerably thinner there than at Lindsey Bridge.

At Welling the Bayou Manard Member consists of dark gray to black, argillaceous, micritic limestones, and calcareous shales.

Bayou Manard Fauna. The bed from which *Australosutura* was collected yields a fairly diverse fauna including brachiopods, pelecypods, and trilobites. By far the most

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abundant elements are *Cleiothyridina sp.* and the trilobite, *Griffithides pustulosus* Snider 1915. Less common are: *Spirifer arkansanum* Girty 1911; *Neochonetes sp.*; two genera of productids; and *?Sphenotus sp.*

Age. According to Dr. Gilbert Klapper (personal communication) the conodont fauna present in the *Australosutura*-bearing bed of the Bayou Manard Member belongs to the *Gnathodus bilineatus–Cavusgnathus characta* Zone of Collinson *et al.* (1962). This bed of the Bayou Manard Member is thus Viséan in terms of the European chronology (see Collinson *et al.* 1962, p. 13, chart 5).

The Argentinian occurrence of *A. gardneri* (Mitchell) has also been suggested to be Viséan in age, whereas the Australian occurrences are considered Westphalian (Amos, Campbell, and Goldring 1960, p. 229). The disparity in age between the Argentine and Australian material of *A. gardneri* led Campbell and Engel (1963, p. 112) to suggest that those occurrences represent separate species. Elsewhere in this paper are noted morphologic differences which support this suggestion, but considering the Viséan Oklahoma *Australosutura* to be closely related to the Westphalian *A. gardneri* from Australia implies that the species really is long ranging.

SYSTEMATIC DESCRIPTION

Family BRACHYMETOPIDAE Prantl and Přibyl 1951
Genus AUSTRALOSUTURA Campbell and Goldring 1960

Type species. Cordania gardneri Mitchell 1922.

Australosutura aff. *A. gardneri* (Mitchell 1922)

Plate 42, figs. 1–9

Material. USNM No. 145307, an incomplete cephalon lacking the left free cheek; USNM No. 145308, a small partly exfoliated cranidium; USNM No. 145309, a fragmentary cephalon preserving the left genal spine; and USNM No. 145310, a pygidium preserved as an internal mold.

Locality and Horizon. A bed 8·7 to 9·2 feet below the top of the Bayou Manard Member, Moorefield Formation, bank of a dry stream which runs generally north–south through the pasture of Mrs. S. Bracket's farm, SE 1/4, SE 1/4, section 7, T. 16 N., R. 23 E., Cherokee County, Oklahoma.

Description. There are no consistent differences in the cephalon between the Oklahoma and Australian specimens (Amos, Campbell, and Goldring 1960, p. 234, pl. 40) of *Australosutura* with the possible exception of one minor character. The tubercles present along the posterior slope of the anterior and lateral cephalic borders appear to be more prominent on the Oklahoma specimens.

The Argentinian specimens assigned to *A. gardneri* by Amos, Campbell, and Goldring (1960, p. 230) do, however, differ importantly from the Oklahoma material. They are distinguished in having: (1) the cephalon more strongly inflated, (2) the anterior part of glabella rising vertically in lateral profile, (3) the frontal area distinctly shorter (sag.), and (4) the glabellar tuberculation finer than that elsewhere on the cephalon.

The single available pygidium is preserved as an internal mould. The description is

partly based on a latex cast of a fragmentary counterpart external mould of the same specimen.

Pygidium wider than long. Axis with 15 rings, the last two of which are represented by aligned tubercles. Each ring with 9 to 11 tubercles arranged in longitudinal rows, median tubercles the most prominent. Ring furrows deep.

In lateral profile axis gently declining to position of sixth ring, more steeply declining thereafter. Axis stops short of posterior margin and overhangs post-axial area. Anterior axial rings inclined forward, posterior ones become progressively more backwardly inclined posteriorly.

In posterior profile axis rises high above pleural regions, semi-octagonal in cross section. Pleural field rises gently from axial furrow but is flexed strongly downward at about $\frac{2}{5}$ total width of field from axial furrow. The fulcrum is marked by a longitudinal (exs.) row of prominent tubercles.

Pleural region subdivided by ten prominent posterior pleural bands (Whittington, 1960, p. 406), the posteriormost two of which are nearly parallel to the axis. The posterior bands persist to the pygidial margin where each is represented by a marginal tubercle. The anterior pleural bands are visible only on the first five segments of the internal mould. Posterior pleural bands about twice as long (exs.) as anterior bands and more strongly convex. There are 5 to 8 evenly spaced tubercles on posterior bands 1 through 8. Interpleural furrows very faint on internal mould.

There is no border furrow, the border being set off by a change in slope.

Dimensions (in mm.)

	USNM 145307	USNM 145308	USNM 145309
cranidial length	8·0	6·9	—
glabellar length plus occip. ring	5·5	4·9	—
glabellar length to occip. furrow	4·7	4·1	—
max. glabellar width	5·0	4·0	6·3
beta–beta width of facial sutures	9·4	6·3	—
length of frontal area	2·6	2·0	—
cephalic width	(15·1)	—	(17·4)

	USNM 145310
max. axial width	4·6
pygidial width	12·5
pygidial length	10·2

Discussion. Because of the widely different ages of the Australian and Argentinian occurrences of *A. gardneri*, Campbell has proposed (Campbell and Engel 1963, p. 112) that the Argentine specimens now be assigned to a separate species. I agree with this

EXPLANATION OF PLATE 42

Australosutura aff. *A. gardneri* (Mitchell).

Figs. 1–5. Cephalon lacking the left free cheek. 1, Dorsal view (×4·4). 2, Latex cast of fragmentary counterpart mould of this specimen showing anterior branch of facial suture (×6). 3, Oblique exterior view (×4·4). 4, Lateral view (×4·4). 5, Anterior view (×4·4). USNM No. 145307.

Fig. 6. Fragmentary cephalon showing genal spine, dorsal view (×4). USNM No. 145309.

Fig. 7. Cranidium, dorsal view (×5). USNM No. 145308.

Figs. 8–9. Exfoliated pygidium. 8, Dorsal view. 9, Lateral view (both ×3). USNM No. 145310.

suggestion but for morphologic rather than stratigraphic reasons. Several major characters which distinguish the Argentine specimens from the Australian topotypes as well as from the Oklahoma material are discussed in the foregoing section on description.

Although the Oklahoma specimens appear to differ in no important respects from the topotypes of *A. gardneri*, it is considered advisable to identify them for now as *A.* aff. *A. gardneri* because of their imperfectness and the fact that I have not examined the topotype specimens.

A Tournaisian species of *Australosutura* from the Tulcumba sandstone of Australia has been described as *Australosutura sp.* (Campbell and Engel 1963, p. 110). This species differs in many respects from the Oklahoma specimens. It has: (1) a distinctly longer and narrower glabella; (2) the glabella more strongly convex in transverse cross section; (3) no enlarged tubercle opposite the 2p glabellar furrow; (4) a relatively shorter, broader pygidium; and (5) the inner part of the pygidial pleural fields much flatter in cross section.

The similarities between *Australosutura* and *Cordania* have already been pointed out (Amos, Campbell, and Goldring 1960, p. 229), and *Cordania* has been suggested by those authors (op. cit. p. 230) as a possible ancestor of *Australosutura*. I would suggest that *Mystrocephala* Whittington (1960, p. 413) in having a broad, concave preglabellar field; no broad, convex cephalic border; and the posterior pygidial segmentation represented by posterior pleural bands is even closer to *Australosutura* than is *Cordania*. *Mystrocephala* is also closer in age to *Australosutura*. The youngest representatives of *Mystrocephala* are Givetian in age (Whittington 1960, p. 414), whereas *Cordania* does not occur in beds younger than Lower Devonian (op. cit. p. 409). Thus *Mystrocephala* is better qualified than *Cordania* as a possible ancestor of *Australosutura*.

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A. R. ORMISTON,
Research Department,
Pan American Petroleum Corporation,
P.O. Box 501,
Tulsa 2, Oklahoma

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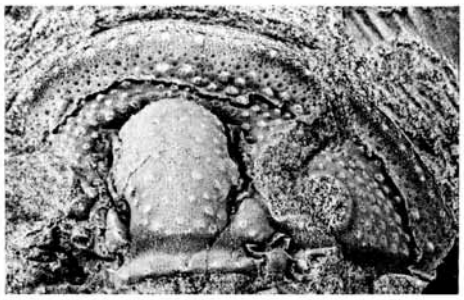

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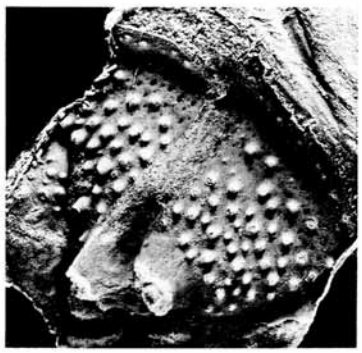

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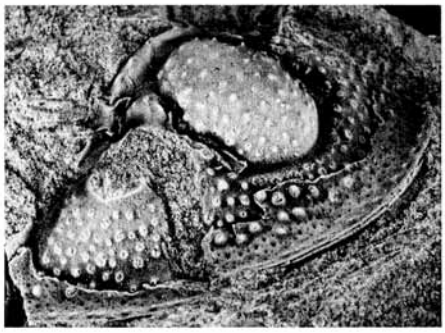

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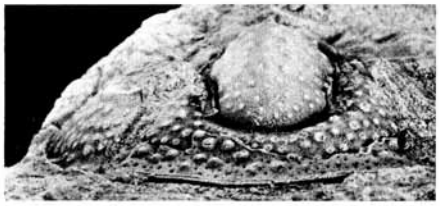

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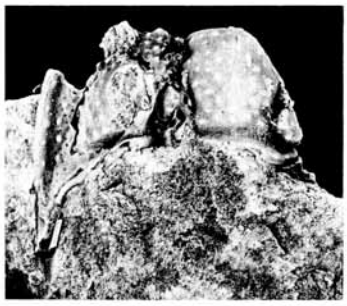

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