The true identity of the supposed giant fossil spider *Megarachne*

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***Megarachne servinei* from the Permo-Carboniferous Bajo de Véliz Formation of San Luis Province, Argentina (32° 17′ S, 65° 25′ E), was described as a giant mygalomorph spider ('tarantula') and, with its body length of 339 mm, the largest known spider ever to have lived on Earth. Its identification as a spider was based on interpretations of the shape of the carapace, the position of the eye tubercle, the anterior protrusion of the carapace as a pair of chelicerae, and the posterior circular structure as the abdomen. X-radiography revealed possible morphology hidden in the matrix: cheliceral fangs, sternum, labium and coxae, and so a reconstruction of *Megarachne* as a giant spider was presented. Difficulties with the interpretation (unusual cuticular ornament, suture dividing the carapace and spade-like anterior border of the chelicera), together with non-preservation of synapomorphies of Araneae, provoked debate about its interpretation as a spider. Now, the holotype and a new specimen have become available for study. *Megarachne* is shown to be a bizarre eurypterid ('sea-scorpion'), similar to rare forms known from Carboniferous rocks of Scotland and South Africa, and is the most complete eurypterid so far recorded from Carboniferous strata of South America.**

Keywords: Chelicerata; Eurypterida; Arachnida; Permo-Carboniferous; Argentina

1. INTRODUCTION

It is a common impression that the largest representative of any group of plants and animals is long extinct, so it was no surprise when Hünicken (1980) described *Megarachne servinei* from Permo-Carboniferous strata of Argentina as the largest spider that had ever lived. Its estimated 50 cm leg-span greatly exceeds that of the next largest spider (living or extinct), *Theraphosa leblondi*, with a leg-span of 30 cm. Hünicken (1980) presented a detailed description, illustrations and reconstructive drawings of *Megarachne* based, to a large extent, on X-ray studies. Plaster casts were eagerly acquired by museums around the world and form the basis of many displays. However, doubt about the interpretation of *Megarachne* as a spider was expressed by some arachnologists (e.g. Shear *et al*. 1989; Eskov & Zonshtein 1990). Access to *Megarachne* for study was difficult until recently because the holotype was deposited in a bank vault, but it has now been accessioned to the Museum of Paleontology, National University of Córdoba, and a new specimen has been discovered in the same locality and horizon.

The original interpretation of *Megarachne* as a spider was based on the general shape of the carapace and position of the eye tubercle, interpretation of the anteromedian protrusion of the carapace with its median ridge as a pair of spatulate chelicerae, and the circular structure posterior to the first tergite as the abdomen. Curved lines on the X-radiographs were interpreted as structures hidden in the matrix, for example, cheliceral fangs, sternum, labium and coxae. Some difficulties with the spider interpretation were noted by Hünicken: the unusual cuticular ornamentation, the suture dividing the carapace into anterior and posterior areas, and the spatulate chelicerae are all unknown in any other spider. In this new study, these morphological features are interpreted differently and in comparison with other giant chelicerates of the Carboniferous Period. *Megarachne* is not a spider, but a giant eurypterid akin to *Woodwardopterus* (Kjellesvig-Waering 1959).

2. MATERIAL AND METHODS

The Electronic Appendix contains details of locality, stratigraphy and repository of the fossils. Material was photographed on Fuji Provia 100F slide film with a Minolta Dynax 9 camera, scanned at 3200 dpi on an Epson scanner and manipulated in Adobe PHOTOSHOP CS on a Macintosh PowerBook G4. Drawings were made using Adobe ILLUSTRATOR CS on the same computer.

3. RESULTS

(a) *Preservation*

Megarachne comes from the upper part of the Pallero Member, the middle of three members constituting the Bajo de Véliz Formation, which also contains well-preserved plants, insects and the trigonotarbid arachnid *Gondwanarachne* (Pinto & Hünicken 1980). Sedimentary features such as varved clayrocks point to an alluvial/lacustrine environment into which the terrestrial biota have been washed (Hünicken & Pensa 1975). The holotype (figure 1*a*,*b*) occurs on dark grey, laminated mudrock. The cuticle is preserved as a carbonized replacement: there is a thin calcite layer beneath this carbon layer, overlying the internal mould, and a slightly thicker one above (see figure 1*a*: tergite 2). The matrix shows thin sheets of calcite on rock laminae, so the mineralization is secondary. The fossil is part only (dorsal surface), but in places the dorsal cuticle is broken away, revealing the ventral cuticle.
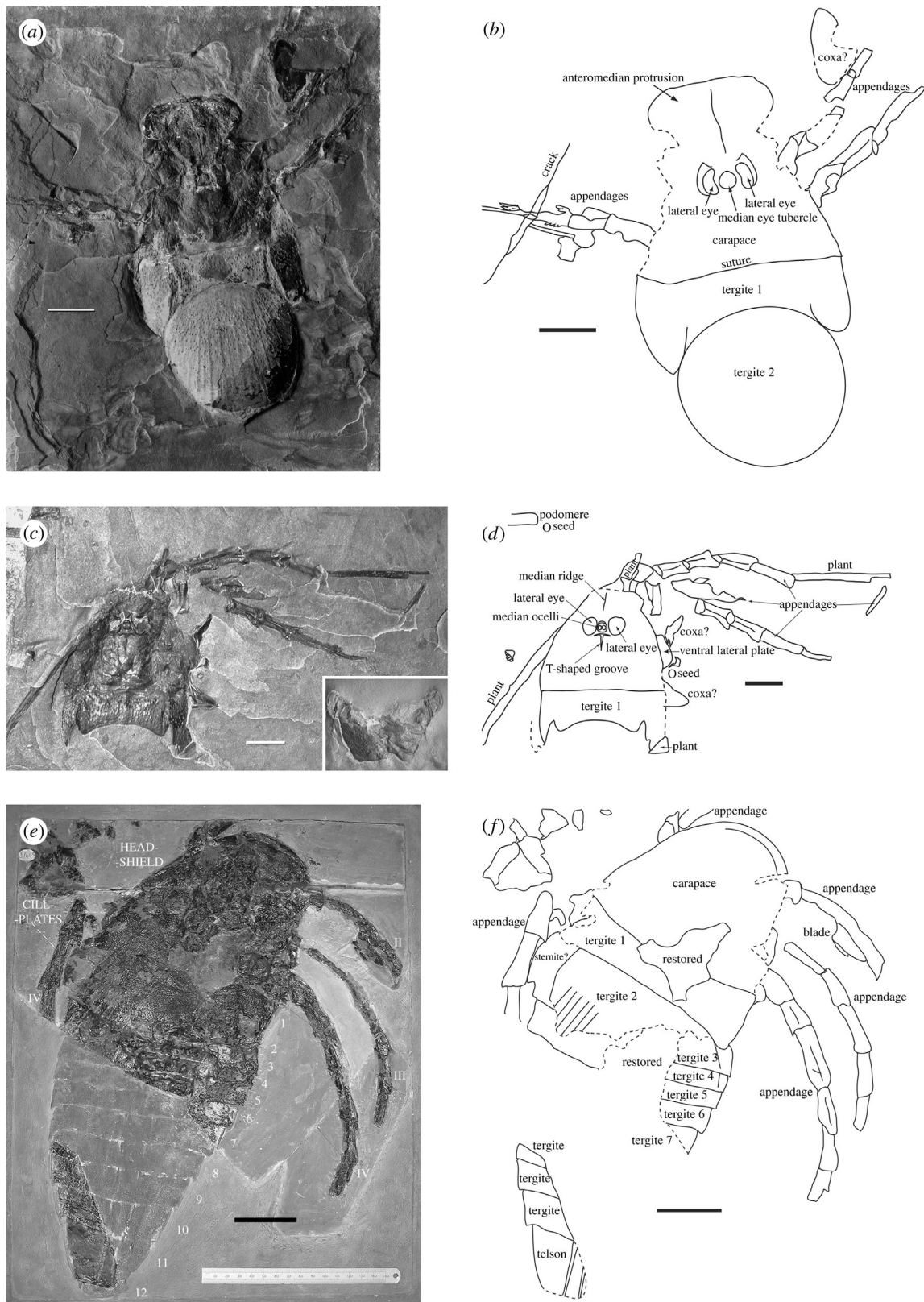
Figure 1. (a) Photograph and (b) camera lucida drawing of holotype specimen of *M. servinei* (Hünicken 1980); (c) photograph and (d) camera lucida drawing of second specimen of *M. servinei* (inset to (c) shows ventral side of specimen); (e) photograph and (f) camera lucida drawing of holotype specimen of *Woodwardopterus scabrosus* (Woodward 1887). Dashed lines mark broken edges. Scale bars, 5 cm.

The new specimen (figure 1c,d) consists of part and counterpart, each on a flagstone of about the same size as the original. The part shows the dorsal surface and its reverse shows ventral structures. The counterpart shows the external mould of the dorsal surface. The new specimen shows no calcite coating to the carbonized cuticle and consists of the carapace and first tergite, but no trace of the second tergite (the supposed spider abdomen).

(b) *Morphological interpretation*

The Electronic Appendix contains formal systematics including detailed descriptions, but only reinterpretation is considered here.

In the X-radiographs, darker areas correspond to thicker and lighter areas to thinner areas of rock matrix. The curved lines, which were interpreted as morphological features, therefore actually represent the boundaries of thicker and thinner areas—edges where rock laminae have broken away with a curved fracture. Thus, X-radiography provides no morphological information and the identifications of hidden structures should be discounted. The interpretation of the anterior structure of the carapace as digging chelicerae is also erroneous. The anterior border, complete with doublure, is well defined, but the lateral edges are broken and the apparent embayments alongside the eyes are where the carapace edge has been broken away, possibly by being compressed against robust appendages during fossilization (figure 1*a,b*). There is no articulation at the base of the supposed chelicerae and the cuticular sculpture continues without a break from the anterior area backwards to the main part of the carapace. Similarly, the median line previously interpreted as a cleft between left and right chelicerae is simply a median ridge, and the cuticular ornament can be seen to continue around its anterior and posterior ends. The 'four stout spines' on the anterior border of the carapace consist of the broken lateral edges of the carapace (lateral spines) and acute pre-ocular mucrones (median spines). The ocular tubercle bears the median eye-pair; large reniform structures on either side of the tubercle are the true lateral eyes. A large first opisthosomal tergite is sutured onto the rear of the carapace, followed by a second large subcircular plate with its surface covered by mucrones and posteriorly radiating ridges. Remains of three appendages are preserved, two on the right and one on the left, though ghosts of appendages in the matrix can also be seen. Most podomeres are stout, with thickened joints and a posterior longitudinal groove. Blade-like structures can be seen on the podomeres of the left side. An incomplete plate adjacent to the anteriormost preserved appendage on the right side may be part of a coxa or metastoma (median ventral plate in eurypterids).

The carapace of the new specimen shows no division between its main part and the anteromedian protrusion, which is incomplete in this specimen and less prominent than that on the holotype. A pair of large subcircular-reniform lateral eyes lies on either side of the median ocular tubercle, which bears a pair of ocelli with a lunate mound in front. Behind the eyes is a T-shaped groove (figure 1*c,d*) and in front is the median ridge. Two coxae and the ventral lateral plate can be seen to protrude around the edge of the carapace. The ventral side shows a pair of large coxae with toothed gnathobases (figure 1*c*, inset), each with two trochanters attached anterolaterally. In front of the coxae lies an ovoid plate that could be part of another coxa or the epistoma (anterior ventral plate in eurypterids).

4. DISCUSSION

Many features of *Megarachne* indicate its assignment to the Eurypterida; for example, the cuticular sculpture of mucrones and raised lunules are characteristic of eurypterids. Apart from the small, streamlined Adelophthalmidae (Tollerton 1989), Permo-Carboniferous eurypterids are bizarre, giant forms. Table 1 compares *Megarachne* with these genera, from which it can be seen that *Megarachne* most closely resembles *Woodwardopterus*.

Woodwardopterus is known only from the holotype, *W. scabrosus* (Woodward 1887), detailed description of which is provided in the Electronic Appendix. The first tergite is large and sutured to the carapace. Its lateral edges are obscure but epimera are suggested on the right-hand side. $CaCO_3$ pustules obscure the eye region. Only the anterior part of the second tergite is preserved; it was clearly much larger but is broken around the lateral and posterior edges. Nevertheless, some radiating ridges can be seen (figure 1*e,f*). Parts of five more posterior tergites are preserved on the right-hand side, which are delineated by clear tergal boundaries and are much shorter than tergites 1 and 2. A detached piece of rock belonging to the holotype was illustrated by Woodward (1887) and represents parts of the posteriormost tergites and the telson (figure 1*e*). The telson is a smooth plate with a pair of slight ridges, considerably longer than the preceding tergites, but lacking its posterior end. All features of the preserved portion of the enlarged second tergite of *Woodwardopterus* agree with the morphology of the second tergite of *Megarachne*, including the radiating lines not previously noted in *Woodwardopterus*. The second tergite must have extended beyond and partly covered more posterior tergites, because of the 20° angle between the anterior borders of tergite 1 and 2 and the anterior borders of more posterior tergites (figure 1*f*). The podomeres of *Woodwardopterus* are short, with thickened ends and longitudinal grooves as in *Megarachne*, and a blade-like structure can be seen on the most anterior preserved appendage (figure 1*e,f*).

We conclude that *Megarachne* and *Woodwardopterus* are confamilial (Woodwardopteridae; Kjellesvig-Waering 1959), but there are two differences between them. First, the mucrones on the carapace and enlarged tergites are densely packed in *Woodwardopterus*, but sparser in *Megarachne*. This could be a function of ontogeny because *Megarachne* is larger than *Woodwardopterus*, and possibly the mucrones became sparser with growth. The generally smaller *Mycterops* has still more densely packed ornament on the carapace and first tergite, which becomes mucronate and folliculated on other parts (Kjellesvig-Waering 1959), so it could represent a still younger form. Note that the gigantic *Cyrtoctenus* (Størmer & Waterston 1968) has localized mucrones. Second, the prominent

Table 1. Comparison of morphological features of *Megarachne* with other large Carboniferous eurypterids. (✓, presence; ×, absence; ?, unknown.)

features	*Megarachne* (Hünicken 1980)	*Woodwardopterus* (Kjellesvig-Waering 1959)	*Mycterops* (Cope 1886)	*Cyrtoctenus* (Størmer & Waterston 1968)	*Hibbertopterus* (Kjellesvig-Waering 1959)	*Dunsopterus* (Waterston 1968)	*Vernonopterus* (Waterston 1968)
carapace length (cm)	17	15	5	35.5	38	>10	?
linguoid ornament	scattered	scattered	dense	localized	scattered	scattered	minute
anteromedian carapace protrusion	✓	×	?	✓	×	?	?
reniform lateral eyes, median eyes on tubercle	✓	✓	✓	✓	✓	?	?
enlarged first opisthosomal tergite	✓	✓	✓	×	×	?	?
enlarged second opisthosomal tergite	✓	✓	?	×	×	?	?
thickened podomeres	✓	✓	?	✓	✓	✓	?
longitudinal grooves on podomeres	✓	✓	?	✓	×	✓	?
blade-like structures on podomeres	✓	✓	?	✓	✓	?	?
coxal *Laden*	✓	?	?	×	✓	?	?
hastate telson with pair of carinae	?	✓	?	✓	✓	?	?

anteromedian carapace protrusion in *Megarachne* is not seen in *Woodwardopterus*, but may be taphonomic because it is not as pronounced in the second specimen of *Megarachne*. It may have been orientated downwards in life and compression during fossilization affected its appearance in the holotype. An anteromedian protrusion occurs in *Cyrtoctenus* (Waterston *et al*. 1985), although this animal does not show enlarged tergites. The telson in *Woodwardopterus* is of a similar morphology to those in *Cyrtoctenus* (Waterston *et al*. 1985), *Hibbertopterus* (Kjellesvig-Waering 1959; Jeram & Selden 1994) and *Hastimima* (White 1908), which is the only other named eurypterid from the Carboniferous of South America. The blade-like structures on the appendages of *Megarachne* and *Woodwardopterus* compare to those in *Cyrtoctenus* (Waterston *et al*. 1985), but none of the large, pectinate blades of that genus have been found in association with woodwardopterids. Coxal *Laden*, seen in *Megarachne* emerging from beneath the carapace (figure 1*c*,*d*), are found in *Hibbertopterus*. The large coxae of *Megarachne* (figure 1*c*, inset) are typical of eurypterids, but *Hibbertopterus* has a large, triangular 'median ventral plate' (metastoma) in this position (Waterston 1957). Waterston illustrated a supposed genital plate beneath the metastoma in one specimen of *Hibbertopterus*. It is possible that this plate is really the metastoma and that the triangular 'median ventral plate' represents (possibly fused) coxae VI. Waterston *et al*. (1985) distinguished Hibbertopteridae from Cyrtoctenidae on the possession of *Laden* and ungrooved podomeres in the former, but Jeram
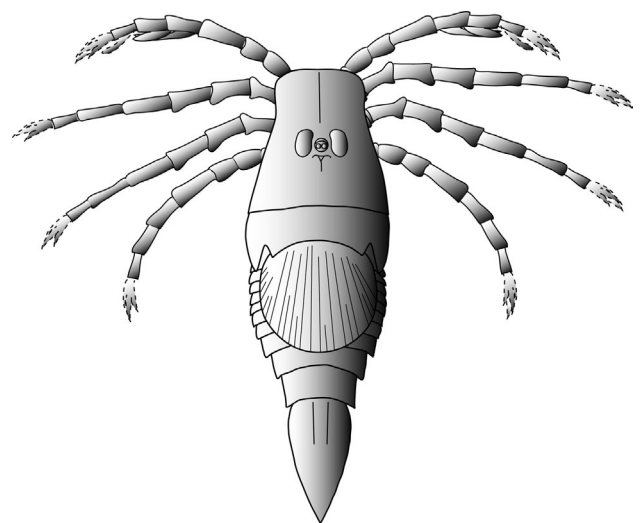

Figure 2. Hypothetical reconstruction of *Megarachne* based on features of the holotype and second specimen together with *Woodwardopterus* (metasoma, telson) and comparison with *Cyrtoctenus* (metasoma, telson). Dashed lines show anatomy reconstructed without direct evidence; chelicerae and palps not known. Total length: *ca* 54 cm.

& Selden (1994) considered that hibbertopterids could simply represent juvenile cyrtoctenids in which these features had yet to develop.

Figure 2 is a suggested reconstruction of *Megarachne*. Vestiges of blade-like structures on the anterior appendages suggest a sediment-raking method of feeding, as in *Hibbertopterus* and *Cyrtoctenus*, which implies aquatic feeding, but sedimentological evidence points to a non-marine habitat. In addition, the function of the large, circular second opisthosomal tergite remains a mystery. There are many puzzles yet to be solved regarding the functional morphology and mode of life of *Megarachne*, but its identity as a bizarre eurypterid, rather than a spider, points in the right direction.

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ELECTRONIC APPENDIX

This is the Electronic Appendix to the article

The true identity of the supposed giant fossil spider
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by

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Supplementary material for:

The true identity of the supposed giant fossil spider *Megarachne*

by Paul A. Selden, José A. Corronca *and* Mario A. Hünicken

SYSTEMATICS

Order Eurypterida Burmeister, 1843

Superfamily Mycteropoidea Cope, 1886

Emended diagnosis. (see Tollerton 1989). Opisthosoma with enlarged first and second tergites.

Comments. Mycterops whitei Schram, 1984 shows has both first and second opisthosomal tergites enlarged.

Family Mycteropidae Cope, 1886

Emended diagnosis. (see Tollerton 1989). Mycteropoidea with a reticulate ornament on carapace and first opisthosomal tergite.

Included genera. Mycterops Cope, 1886.

Comments. *Mycterops* Cope, 1886 was known only from carapace and attached first tergite (*M. ordinatus* Cope, 1886; *M. mathieui* Pruvost, 1925) and some scraps of cuticle (e.g. *M.* (?) *blairi* Waterston, 1968) until Schram (1984) described a detached carapace and mesosoma on one slab, and isolated caudal segments and telson, as *M. whitei* Schram, 1984. The isolated caudal segments are not associated with the carapace and body segments, and so can only questionably be assigned to the genus. The photograph of the main specimen (Figure 7C) and the description suggest that this *Mycterops* has two enlarged tergites immediately behind the carapace. Though not so enlarged as in *Megarachne*, the second opisthosomal tergite in this small form has a bowed posterior margin. It is possible that *Mycterops* represents a juvenile woodwardopterid. However,

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some cuticle scraps indicate that *Mycterops* could get very large (e.g. *M. ordinatus*, Kjellesvig-Waering (1959), Plate 38, figure 5; *M. (?) blairi,* Waterston (1968) Plate 1, figure 1), and still retain the reticulate ornament. For this reason, it is retained in a separate family until more complete material comes to light and help resolve the relationship of the mycteropoids.

Family Woodwardopteridae Kjellesvig-Waering, 1959

Emended diagnosis. (see Tollerton 1989). Mycteropoidea with an ornament of linguoid mucrones on carapace and first opisthosomal tergite.

Included genera. *Megarachne* Hünicken, 1980; *Vernonopterus* Waterston, 1968; *Woodwardopterus* Kjellesvig-Waering, 1959.

Vernonopterus is poorly known, does not show the characters of the family, and was placed here by Waterston (1968) because its preserved parts suggest enlarged tergites.

Genus *Megarachne* Hünicken, 1980

Emended diagnosis. Woodwardopterid with sparser mucrones on carapace and first two opisthosomal tergites than the nominate genus; prominent anteromedian carapace protrusion.

Comment. The sparser mucrones on *Megarachne* could be a function of ontogeny because *Megarachne* is larger than *Woodwardopterus* and possibly the mucrones became sparser with growth. Note that *Mycterops*, suggested above as a juvenile woodwardopterid, has dense mucronation; the gigantic *Cyrtoctenus* has localized mucrones. The prominence of the anteromedian carapace protrusion in *Megarachne*, not seen in *Woodwardopterus*, may be taphonomic, since it is not so pronounced in the second specimen of *Megarachne*. It may have been orientated downwards in life and compression during fossilization affected its appearance in the holotype.

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Megarachne servinei Hünicken, 1980

Holotype. CORD-PZ 2110 in the Museum of Palaeontology, National University of Córdoba, Argentina.

Additional specimen. Part and counterpart in the private collection of Sr Guido Pollini of Santa Rosa, San Luis Province, Argentina.

Locality. Both specimens come from the upper part of the Pallero Member, the middle of three members constituting the Bajo de Véliz Formation, Santa Rosa II quarry, Santa Rosa, San Luis Province, Argentina. Age is latest Carboniferous, possibly earliest Permian (Hünicken *et al*. 1981).

Diagnosis. As for the genus.

Description of holotype. (Figure 1a, b in main paper). Carapace length 170 mm, maximum (posterior) width 180 mm; campanulate outline, with apparent anteromedian protrusion (may be taphonomically enhanced). Reniform lateral eyes 23 mm long with forwardly directed acute mucrone in front of each; lateral eyes lie on either side of circular ocular tubercle, 15 mm in diameter, bearing pair of median ocelli; ocular area situated subcentrally on carapace, 90 mm from anterior border. Median ridge runs from close to anterior border of carapace to just anterior to eye region. First opisthosomal tergite sutured to posterior border of carapace; sagittal length 38 mm, maximum (lateral) length 92 mm, width 190 mm; narrow medially, broadening laterally where produced into prominent, leaf-shaped epimera. Second opisthosomal tergite a large, subcircular plate 142 mm long, 147 mm wide. Carapace, first and second opisthosomal tergites ornamented with linguoid lunules, some folliculated; second tergite additionally bears ridges radiating slightly posteriorly, running from its anterior to posterior borders, resembling ribs on a scallop shell. No more of the opisthosoma preserved. Isolated plate,

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68 mm long, bearing broad, unfolliculated lunules, may represent a detached coxa or metastoma. Two appendages seen on right side, one on left, but evidence of at least one more on the left side shown by ridge on the matrix. Anterior appendage on right shows 30 mm portion of podomere emerging from beneath carapace, followed by curved podomere 51 mm long; two connected podomere pieces (proximal 32 mm long, distal 27 mm long), slightly anterior to long axis of anterior appendage, may belong to this appendage. 32 mm portion of proximal podomere of posterior appendage on right emerges from beneath carapace, succeeded by two podomeres (proximal 48 mm long, distal 63 mm long). Visible appendage on left side shows portion of podomere 42 mm long emerging from beneath carapace, succeeded by 33 mm long podomere. Other podomeres on this side difficult to measure but show blade-like structures apparently developed from enlarged mucrones or spines. Most podomeres stout, with pronounced expansions at joints; longitudinal posterior groove apparent on second podomere of posterior appendage on right.

Description of new specimen. (Figure 1c, d in main paper). Part consists of carapace with anterior border poorly preserved; preserved length 141 mm, posterior width 172 mm, campanulate outline. Suboval lateral eyes 23 mm long (probably reniform in life but taphonomically compressed), on either side of circular ocular tubercle, 14 mm in diameter, bearing pair of circular median ocelli with procurved lunate mound in front; ocular area situated subcentrally on carapace, 87 mm from posterior border. Median ridge runs from close to anterior border of carapace to just anterior to eye region, separated from eye group by patch of pustules. T-shaped groove, 22 mm long, 20 mm wide, posterior to eye region. Part of ventral lateral plate of prosoma preserved on right side. First opisthosomal tergite sagittal length 42 mm, maximum (lateral) length 88 mm,

approximate width 186 mm; narrow medially, broadening laterally where produced into prominent, leaf-shaped epimera. Anterior border straight, where sutured to posterior border of carapace; posterior border strongly procurved, with angular notches separating epimera from main body of tergite. No more of opisthosoma preserved. Parts of four appendages preserved on right side. Anteriormost appendage with portions of six podomeres, measuring (proximal–distal) ≥15 mm, 26 mm, 41 mm, 43 mm, 54 mm, 64 mm. Second appendage with one podomere of length 48 mm; complex area of cuticle beyond suggests podomeres with blade-like structures belonging to this appendage. Third appendage with fragment of coxal *Lade* emerging from beneath ventral lateral plate; immediate post-coxal podomeres absent, more distal four measure (proximal–distal) 54 mm, 44 mm, 59 mm, 43 mm. At least third to fifth podomeres of anterior appendage, podomere of second appendage, and first and second post-coxal podomeres of fourth appendage with bulbous ends and posterior longitudinal groove. Only small fragment of coxa of posterior appendage preserved. Tiny fragment of podomere cuticle bearing strong mucrones on posterior edge lies beyond edge of carapace on left side.

Reverse of slab bearing part shows pair of large (appendage VI?) coxae (total width 126 mm), bearing mucrones with convex sides facing inwards, gnathobases showing at least five large teeth; parts of possibly two trochanters attached to anterolateral corner of each coxa. Anterior to the coxae lies a smooth, transversely suboval plate which may be the epistoma.

Counterpart shows no additional features to those seen on the part.

Genus *Woodwardopterus* Kjellesvig-Waering, 1959

Emended diagnosis. Woodwardopterid with relatively dense mucronation on carapace and first two opisthosomal tergites; no anteromedian carapace protrusion.

Woodwardopterus scabrosus (Woodward, 1887)

Holotype and only known specimen. I1445 (part) and I1436 (counterpart) in the Natural History Museum, London. Note: Waterston (1957) gave the accession number as 16082, but there is no doubt that the different numbers refer to the same specimen.

Locality. Fossiliferous shales on the eastern bank of the River Esk, Glencartholm, Dumfriesshire, Scotland. The shales occur within the Glencartholm Volcanic Beds of the Middle Border Group of southern Scotland, which roughly equates to the lower part of the Oil Shale Group of the Scottish Midland Valley; Lower Carboniferous, Viséan (Holkerian) in age (Lumsden *et al*. 1967).

Diagnosis. As for the genus.

Description. (Figure 1e, f in main paper). Carapace campanulate, with anterior doublure, but no prominent anteromedian protrusion; 146 mm long, 114 mm wide. Eye region obscured by $CaCO_3$ pustules. First opisthosomal tergite sagittal length 26 mm, length at lateral edge 50 mm but lateral edges obscure and epimera suggested on right side. Anterior border slightly recurved, sutured to carapace, posterior border slightly procurved. Only anterior part of second opisthosomal tergite preserved; lateral edges obscure, broken around lateral and posterior edges. Ornament of closely spaced mucrones on carapace and tergites 1 and 2, becoming sparser on posterior tergites; some posteriorly slightly radiating ridges on second opisthosomal tergite. Parts of opisthosomal tergites 3–7 seen on right side, delineated by tergal boundaries, bearing mucrones and 3–4 with slight submarginal longitudinal ridges, much shorter than tergites 1 and 2 (15 mm long), at 20° angle from posterior edge of tergite 1. Smooth cuticle emerging from beneath tergite 2 of left side is possible sternite. Parts of at least three appendages on each side preserved. Right anteriormost appendage shows 15 mm part of proximal podomere emerging from

beneath carapace, followed by 90 mm of appendage undifferentiated into podomeres, bearing blade-like structures posteriorly. Right second appendage shows fragment of coxa showing beneath broken carapace edge; detached section of five podomeres measuring (proximal–distal) 37 mm, 32 mm, 42 mm, 37 mm, 26 mm. Right posterior appendage shows piece of coxa emerging from beneath carapace, together with six post-coxal podomeres measuring (proximal–distal) 26 mm, 26 mm, 52 mm, 37 mm, 35 mm, 26 mm; podomeres 2–4 of this series show a posterior longitudinal groove. Left anterior appendage represented only by short fragments of proximal podomeres. Group of criss-crossing podomeres on the left side probably represents parts of left second and third appendages. Left posterior appendage consists of coxal fragments and series of three post-coxal podomeres measuring (proximal–distal) 36 mm, 46 mm, ≥26 mm. Detached piece, now mounted in plaster alongside remainder of holotype represents parts of posteriormost opisthosomal tergites; anteriormost incomplete, next 20 mm long, next 26 mm long; and telson. Telson a hastate, smooth plate with pair of parallel ridges (possibly on ventral surface but impressed through to dorsal during compaction) 12 mm apart; posterior tip broken, preserved sagittal length 44 mm.

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