DEPARTMENT OF MINERALS AND ENERGY
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

BULLETIN 153

VOLUME 2 (Plates)

Late Cambrian and Early Ordovician Trilobites from the Burke River Structural Belt, Western Queensland, Australia

J. H. SHERGOLD

AUSTRALIAN GOVERNMENT PUBLISHING SERVICE
CANBERRA, 1975

BULLETIN: 153 Volume II CORRIGENDA

In the plates the following figure numbers have been transposed:

Pl. 8	figs 4 and 5
Pl. 13	figs 13 and 15
Pl. 18	figs 7 and 8
Pl. 24	figs 9 and 10
Pl. 31	figs 5 and 6
Pl. 52	figs 8 and 9
Pl. 58	figs 8 and 10

DEPARTMENT OF MINERALS AND ENERGY

MINISTER: THE HON. R. F. X. CONNOR, M.P.

SECRETARY: SIR LENOX HEWITT, O.B.E.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

DIRECTOR: N. H. FISHER

ASSISTANT DIRECTOR, GEOLOGICAL BRANCH: J. N. CASEY

Published for the Bureau of Mineral Resources, Geology and Geophysics
by the Australian Government Publishing Service

ISBN 0 642 00942 2

MANUSCRIPT RECEIVED: MARCH 1973

REVISED MANUSCRIPT RECEIVED: AUGUST 1973

ISSUED: FEBRUARY 1975

Printed by Graphic Services Pty Ltd, 86a Pirie Street, Adelaide 5000

PLATES

The illustrated specimens were prepared by the author and photographed by Mr H. M. Doyle and the author. All specimens were blackened with water-soluble ink before whitening with either ammonium chloride or magnesium oxide.

PLATE 1

Figures 1-6 *Pseudagnostus clarki* Kobayashi, 1935, *patulus* subsp. nov. .... page 62
All specimens from the Black Mountain section

Figure 1 CPC 11524, **holotype,** cephalon with shell partly dissolved, showing traces of musculature and median preglabellar furrow; length (sag.) 3.95 mm; horizon K106; x14.

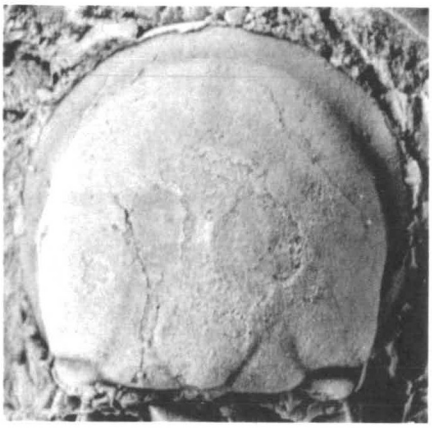
Figure 2 CPC 11525, large cephalon showing parietal morphology; length 4.60 mm; horizon K106; x14. This specimen shows the large major posterior scars of the posterior lobe, the oblique lateral scars, and the axial carina.

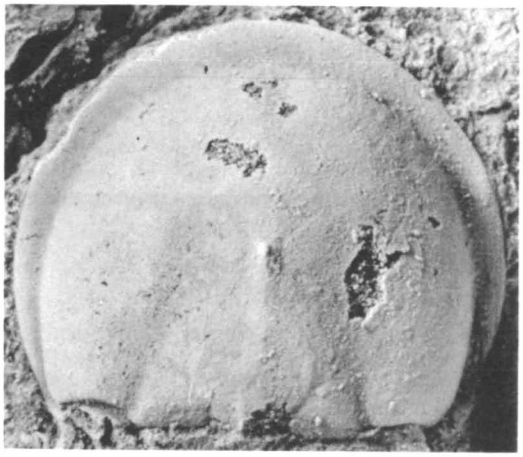
Figure 3 CPC 11526, large almost completely exfoliated cephalon; length 4.80 mm; horizon K104; x12.

Figure 4 CPC 11527, partly exfoliated pygidium showing very small posterolateral spines situated well in advance of the rear of the deuterolobe; length (Lp_2) 4.50 mm; horizon K107; x12.

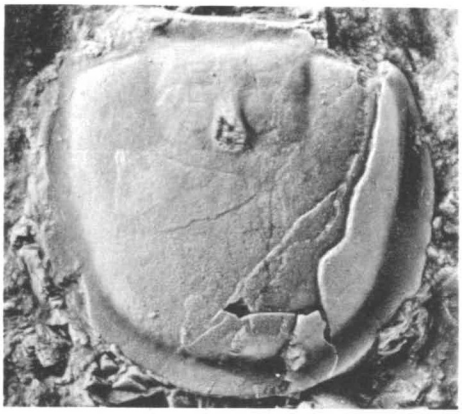
Figure 5 CPC 11528, latex cast from parietal surface of incomplete cephalon; horizon K105; x10. This specimen shows all the features of the musculature drawn on Text-fig. 15. Note the two pairs of scars, major and minor posterior scars, at the rear of the posterior lobe, and the deltoid areas; the scrobiculate acrolobe; and the caecal diverticulum which leads from the right side of the anterior lobe.

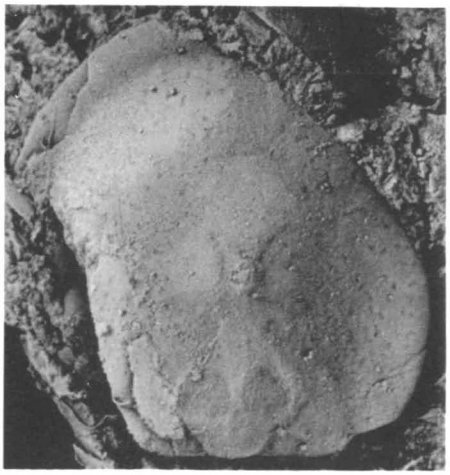
Figure 6 CPC 11529, distorted testaceous pygidium showing the morphology associated with the articulating half-ring and facets; length (Lp_1) 4.90 mm; horizon K106; x12.


1


2


3


4


5


6

PLATE 2

Figures 1-2 *Pseudagnostus clarki* Kobayashi, 1935, *patulus* subsp. nov. .... page 62
Specimens from the Black Mountain section

Figure 1 CPC 11531, large, mostly exfoliated pygidium showing undistorted shield shape; length (Lp_1) 4.37 mm; horizon K103; x14. Note the very small posterolateral spines.

Figure 2 CPC 11530, large exfoliated pygidium showing the parietal morphology illustrated in Text-fig. 15; length (Lp_1) 5.50 mm; horizon K107; x12. Note especially the intranotular sulcus and the morphology at its coalescence with the axial node; the scrobiculate acrolobe; and the accessory furrows faintly discernible proximally.

Figures 3-7 *Pseudagnostus elix* sp. nov. .... page 71
All specimens from the Black Mountain section

Figure 3 CPC 11688, **holotype,** a testaceous pygidium; length (Lp_1) 3.75 mm; horizon K103; x15. The specimen shows relatively wide marginal furrows and thorn-like posterolateral spines, and has a markedly constricted acrolobe.

Figure 4 CPC 11691, small testaceous pygidium; length (Lp_2) 2.62 mm; horizon K103; x16. Shows essentially the same attributes as the holotype.

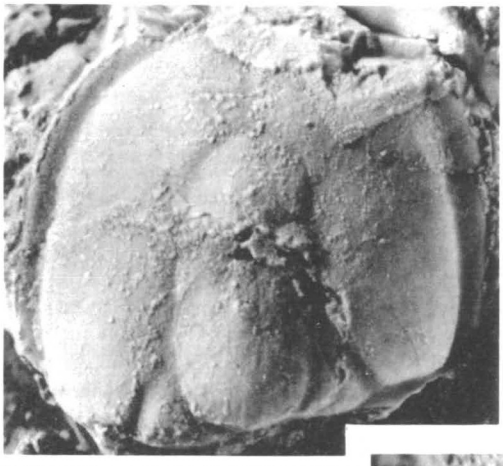
Figure 5 CPC 11688, **holotype,** lateral aspect; x15.

Figure 6 CPC 11689, exfoliated cephalon associated with the holotype pygidium; length (est.) 3.90 mm; horizon K103; x14. This cephalon has narrow borders, a median preglabellar furrow, cylindrical glabella with anteriorly pointed anterior lobe.

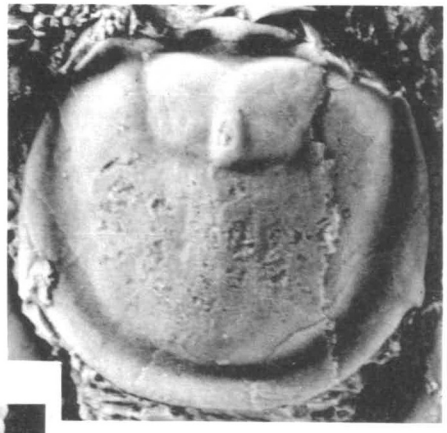
Figure 7 CPC 11690, exfoliated cephalon, laterally compressed, showing the position of the axial node with relation to the anterolateral lobes; length 3.19 mm; horizon K103; x16.

1

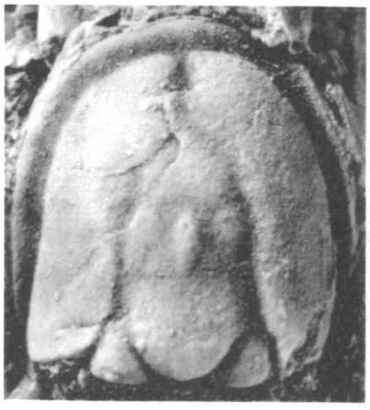
2



6

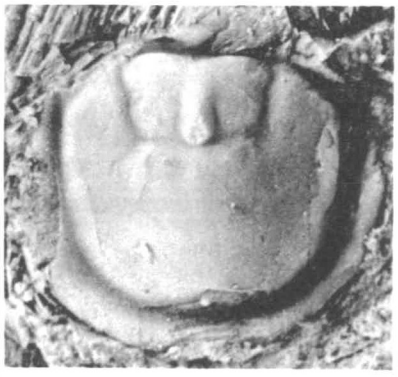


3



7

5



4

PLATE 3

Figures 1-6 *Pseudagnostus clarki* Kobayashi, 1935, *prolatus* subsp. nov. .... page 64
All specimens from the Black Mountain section

Figure 1 CPC 11536, exfoliated and weathered specimen showing parietal morphology to great advantage; length (est.) 4.15 mm; horizon K111; x14. The acrolobe is scrobiculate and a prominent caecal diverticulum is readily discerned adjacent to the axial furrow on the left side of the specimen. A second diverticulum is visible on the right side emerging from the anterior lobe. The arrangement of muscle scars is compounded in Text-fig. 26.

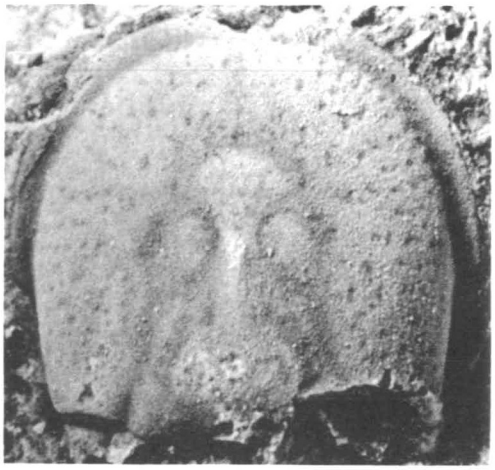
Figure 2 CPC 11535, exfoliated cephalon, less weathered, showing the general shape of the shield and its proportions; length 3.90 mm; horizon K111; x14. Note the position of the high spot on the axial node.

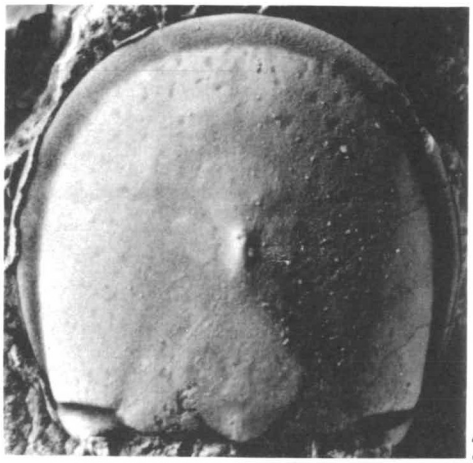
Figure 3 CPC 11534, exfoliated cephalon showing the caecal network and in particular the presence of two pairs of diverticula issuing from the anterior lobe on the right; horizon K111; x14.

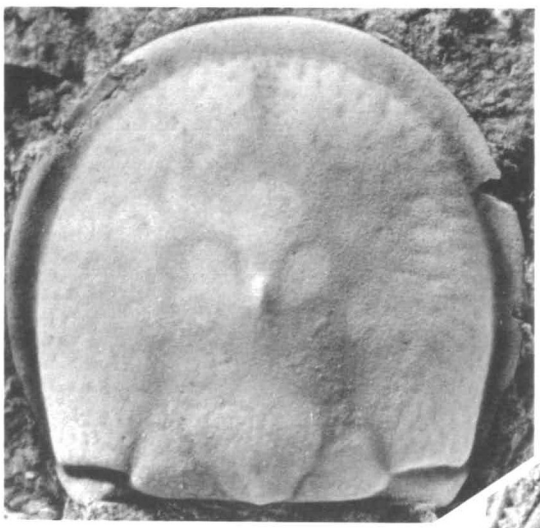
Figure 4 CPC 11533, exfoliated cephalon showing full parietal morphology and the proportions of the shield; length 3.50 mm; horizon K111; x14.

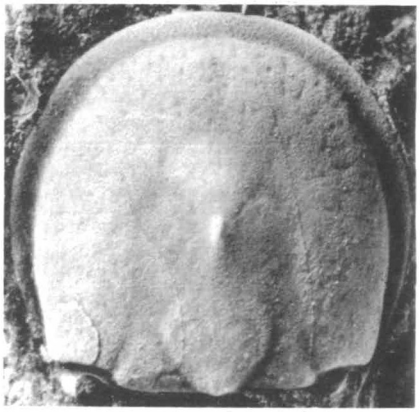
Figure 5 CPC 11532, **holotype,** an exfoliated cephalon; length 4.15 mm; horizon K111; x14.

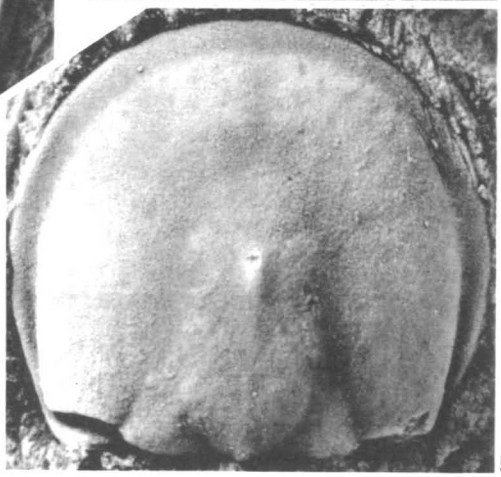
Figure 6 CPC 11535, lateral aspect illustrating degree of convexity (sag.); horizon K111; x14.


1


2


3


4


5

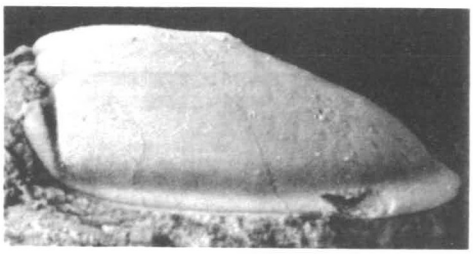

6

PLATE 4

Figures 1-6 *Pseudagnostus clarki* Kobayashi, 1935, *prolatus* subsp. nov. .... page 64
All specimens from the Black Mountain section

Figure 1 CPC 11537, partly exfoliated pygidium, length (Lp_1) 2.50 mm; horizon K111; x15. Shows general form of a typical small pygidium. The posterolateral spines are very small, and the shield has an overall ovoid shape.

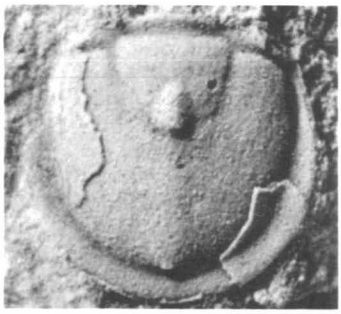
Figure 2 CPC 11538, an incomplete exfoliated pygidium showing a punctate parietal surface; well defined notulae and intranotular ridge, and bifid axial node; length (Lp_2) 3.65 mm; horizon K111; x14. The acrolobe of this specimen is more bluntly rounded than in most others referred to the subspecies.

Figure 3 CPC 11539, large exfoliated pygidial mould; length (Lp_2) 4.25 mm; horizon K111; x14. Shows the typical late holaspid condition of the subspecies. Ten metameres are visible in the axial portion of this specimen as deduced from the muscle scars and notulae.

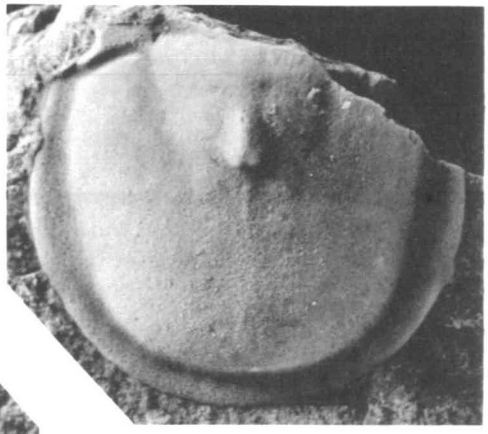
Figure 4 CPC 11540, latex cast from pygidial mould of CPC 11539, showing to advantage the structure of the articulating half-ring, and the bilobed and bifid axial node; x14.

Figure 5 CPC 11541, pygidial parietal surface showing musculature; length (Lp_1) 3.40 mm; horizon K111; x14. Traces of 11 metameres are evident, and the bifid bilobed axial node is again well preserved.

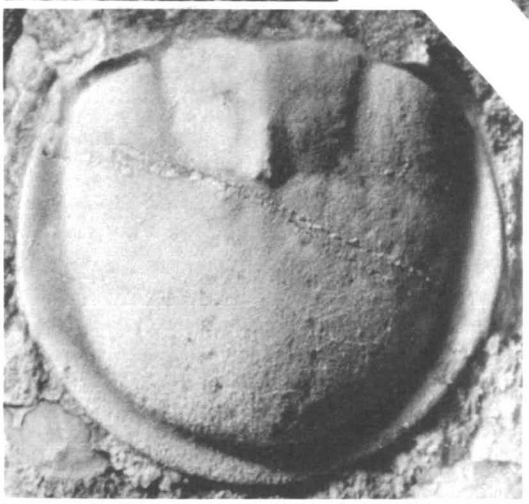
Figure 6 CPC 11542, latex cast from parietal surface showing the arrangement of muscle scars and apodemes. Ten, perhaps eleven metameres are visible, and the notulae are seen to be paired from metamer 5 rearwards. Length (Lp_1) 3.50 mm; horizon K111; x16.



1



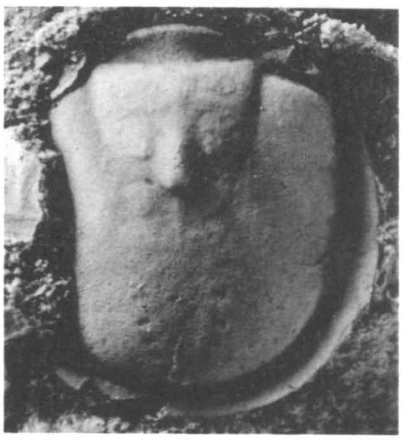
2



3

4

5



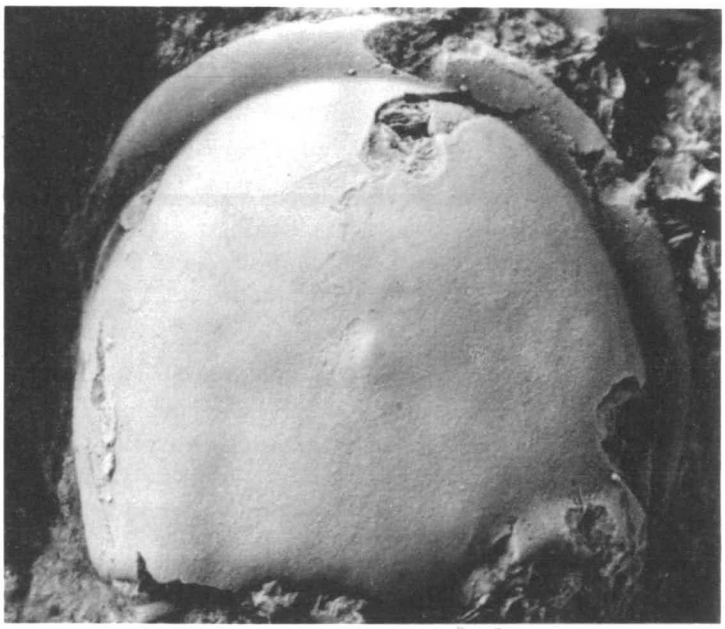
6

PLATE 5

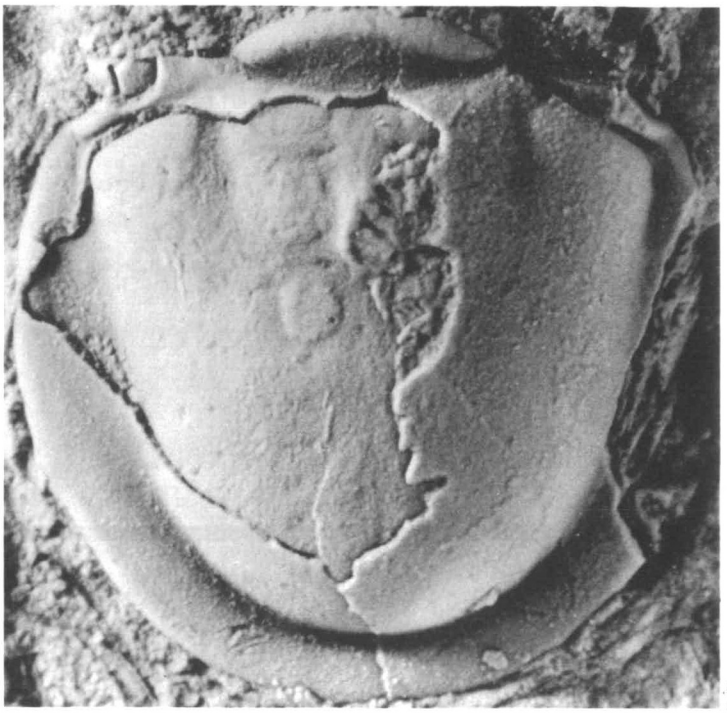
Figures 1-2 *Pseudagnostus clarki* Kobayashi, 1935, *maximus* subsp. nov. .... page 70
All specimens from the Black Mountain section

Figure 1 CPC 11587, **holotype,** testaceous cephalon; length 5.25 mm; horizon K121; x16.5. The glabella is completely effaced except for the high spot on the axial node. A faint median preglabellar furrow is visible near the marginal furrow anteriorly.

Figure 2 CPC 11590, partly exfoliated pygidium showing the differing external testaceous and parietal morphology; length (Lp_1) 6.30 mm; horizon K121; x15.75. The specimen has thick shell, small posterolateral spines, wide borders, and paired notulae on the parietal surface.



1



2

PLATE 6

Figures 1-6 *Pseudagnostus coronatus* sp. nov. .... page 85
All specimens from the Black Mountain section

Figure 1 CPC 11695, latex cast from external mould of incomplete cephalon, slightly distorted laterally, having virtually effaced glabellar furrows, axial node, and median preglabellar furrow; length 3.35 mm; horizon K106; x15.

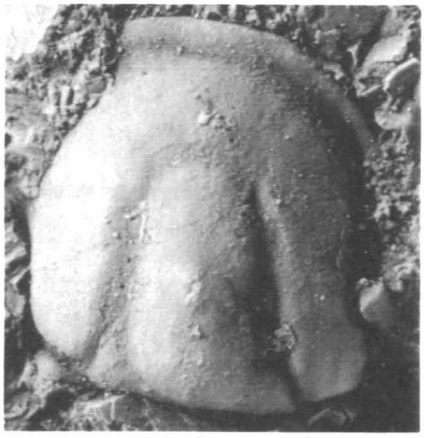
Figure 2 CPC 11692, **holotype,** cephalon retaining traces of shell; length 3.60 mm; horizon K106; x14. Shows the relationship of the axial node to the glabellar lobes and furrows, and the general shape of the shield.

Figure 3 CPC 11693, partly exfoliated cephalon, showing araneavelate prosopon adjacent to the axial furrow on the right of the specimen; length 4.00 mm; horizon K106; x14.

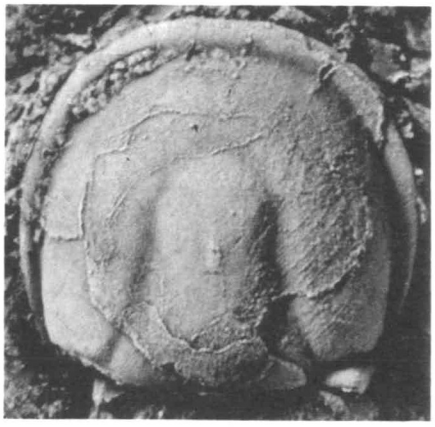
Figure 4 CPC 11694, exfoliated cephalon showing scrobicules on the outer flanks of the acrolobe adjacent to the marginal furrow (on the right); length 3.60 mm; horizon K106; x14.

Figure 5 CPC 11696, an exfoliated incompletely preserved pygidium which is considered to belong to this species; length (Lp_2) 3.10 mm; horizon K105; x14. The specimen has wide lateral borders, a constricted acrolobe, and thorn-like postero-lateral spines in advance of the rear of the deuterolobe.

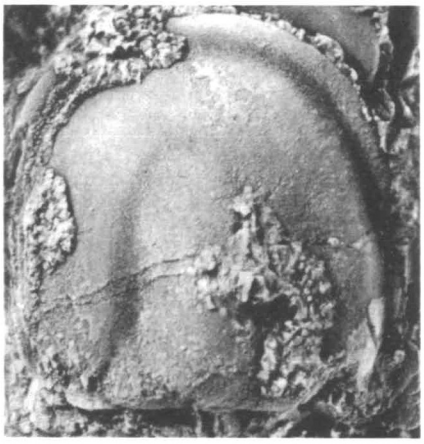
Figure 6 CPC 11697, exfoliated pygidium showing parietal morphology; length (Lp_1) 3.20 mm; horizon K106; x15. Eight metameres may be present in the axial region of this specimen.



1

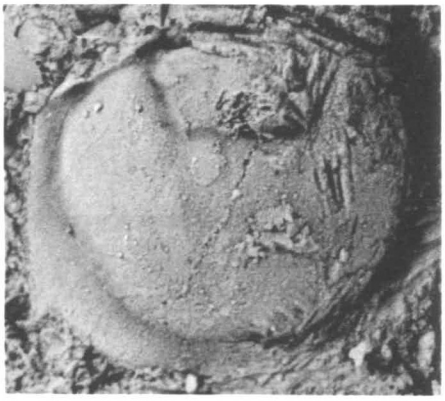


2

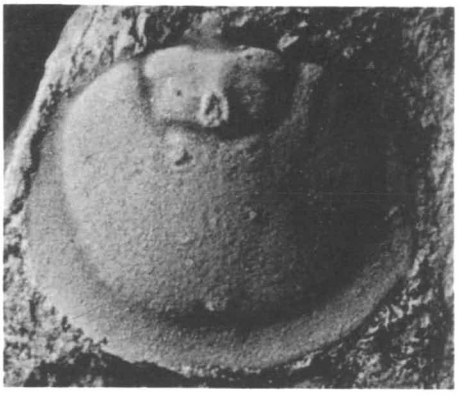


4

3



5



6

PLATE 7

Figures 1-2 *Pseudagnostus* sp. A .... page 89
Both specimens from the Black Mountain section

Figure 1 CPC 11710, partly exfoliated incomplete pygidium, showing small posterolateral spines situated well to the rear of the shield; length (Lp_2) 3.18 mm; horizon K103; x14.

Figure 2 CPC 11711, exfoliated pygidium showing hooked posterolateral spines and wide borders; length (Lp_1) 3.35 mm; horizon K104; x15.

Figures 3-4 *Pseudagnostus* sp. B .... page 90
Both specimens from the Black Mountain section

Figure 3 CPC 11712, exfoliated incomplete pygidium with subrectangular acrolobe, and posterolateral spines lying well in advance of the rear of the deuterolobe; length (Lp_2) 3.30 mm; horizon K106; x15.

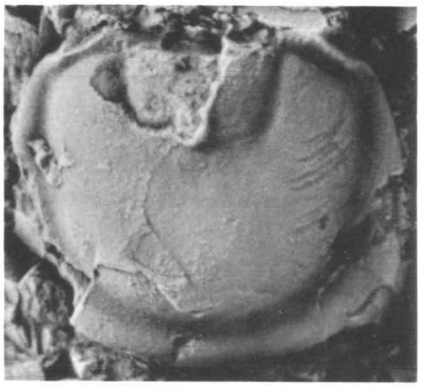
Figure 4 CPC 11713, exfoliated pygidium; length (Lp_2) 3.00 mm; horizon K106; x16.

Figures 5-7 *Pseudagnostus* sp. C .... page 91
All specimens from the Black Mountain section

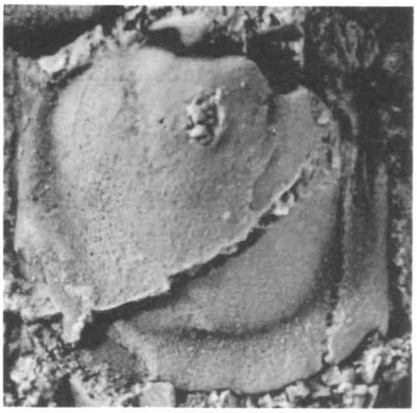
Figure 5 CPC 11714, latex cast from external mould of cephalic fragment; length 3.50 mm; horizon K111; x9. Shows the laterally constricted glabella, convexity of the acrolobe, and deliquiate marginal furrows.

Figure 6 CPC 11715, exfoliated and incomplete pygidium with subcircular deuterolobe, wide borders; length (Lp_2) 2.60 mm; horizon K111, x14.

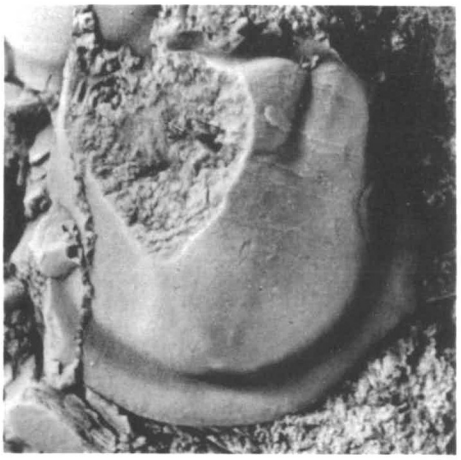
Figure 7 CPC 11716, latex cast from cephalic fragment showing traces of parietal morphology; horizon K111; x14.



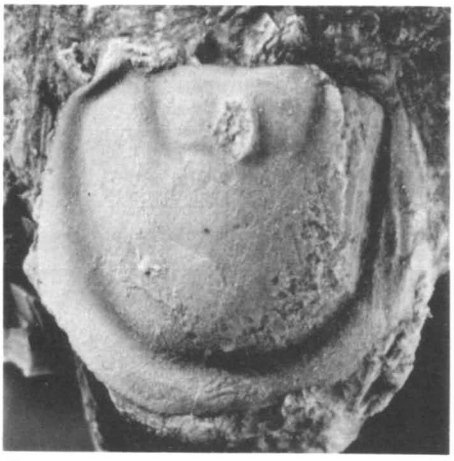
1



2

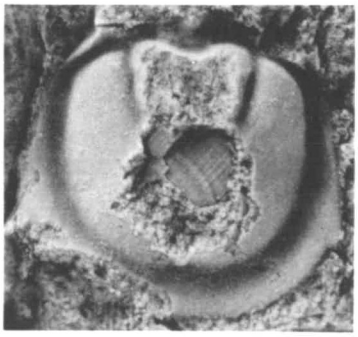


3



4

5



6

7

PLATE 8

Figures 1-5 *Pseudagnostus denticulatus* sp. nov. .... page 87
All specimens from the Black Mountain section

Figure 1 CPC 11705, **holotype,** testaceous cephalon showing narrow borders, absence of median preglabellar furrow, largely effaced lobes and furrows, and laterally constricted glabella; length 2.70 mm; horizon K118; x14.

Figure 2 CPC 11706, partly exfoliated cephalon conforming with the holotype; length 2.55 mm; horizon K118; x14.

Figure 3 CPC 11707, small exfoliated cephalon with faint traces of parietal morphology; length 2.05 mm; horizon K118; x15.

Figure 4 CPC 11708, subcircular pygidium attributed to this species, partly exfoliated, with relatively wider borders than the cephalon, and small denticulate posterolateral spines; length (Lp_2) 2.85 mm; horizon K118; x14.

Figure 5 CPC 11709, detail of pygidium showing mode of derivation of posterolateral spine; length (Lp_2) 3.10 mm; horizon K118; x15.

Figures 6-12 *Pseudagnostus clavus* Shergold, 1972 .... page 84
All specimens from the Black Mountain section

Figure 6 CPC 11704, partly exfoliated incomplete pygidium with subrectangular acrolobe, relatively wide borders, and spines set well back on the shield; length (Lp_2) 2.55 mm; horizon K116; x15.

Figure 7 CPC 11703, latex cast from mould of partly exfoliated pygidium; length (Lp_1) 2.30 mm; horizon K121; x14.

Figure 8 CPC 11702, partly exfoliated pygidium showing general shape of the shield and the position of posterolateral spines; length (Lp_1) 3.00 mm; horizon K121; x15.

Figure 9 CPC 11699, small exfoliated cephalon; length 1.40 mm; horizon K121; x14.

Figure 10 CPC 11698, very small exfoliated cephalon; length 1.05 mm; horizon K121; x14.

Figure 11 CPC 11700, testaceous cephalon; length 2.05 mm; horizon K121; x14.

Figure 12 CPC 11701, partly exfoliated damaged cephalon with traces of glabellar furrowing; length 3.30 mm; horizon K121; x14.

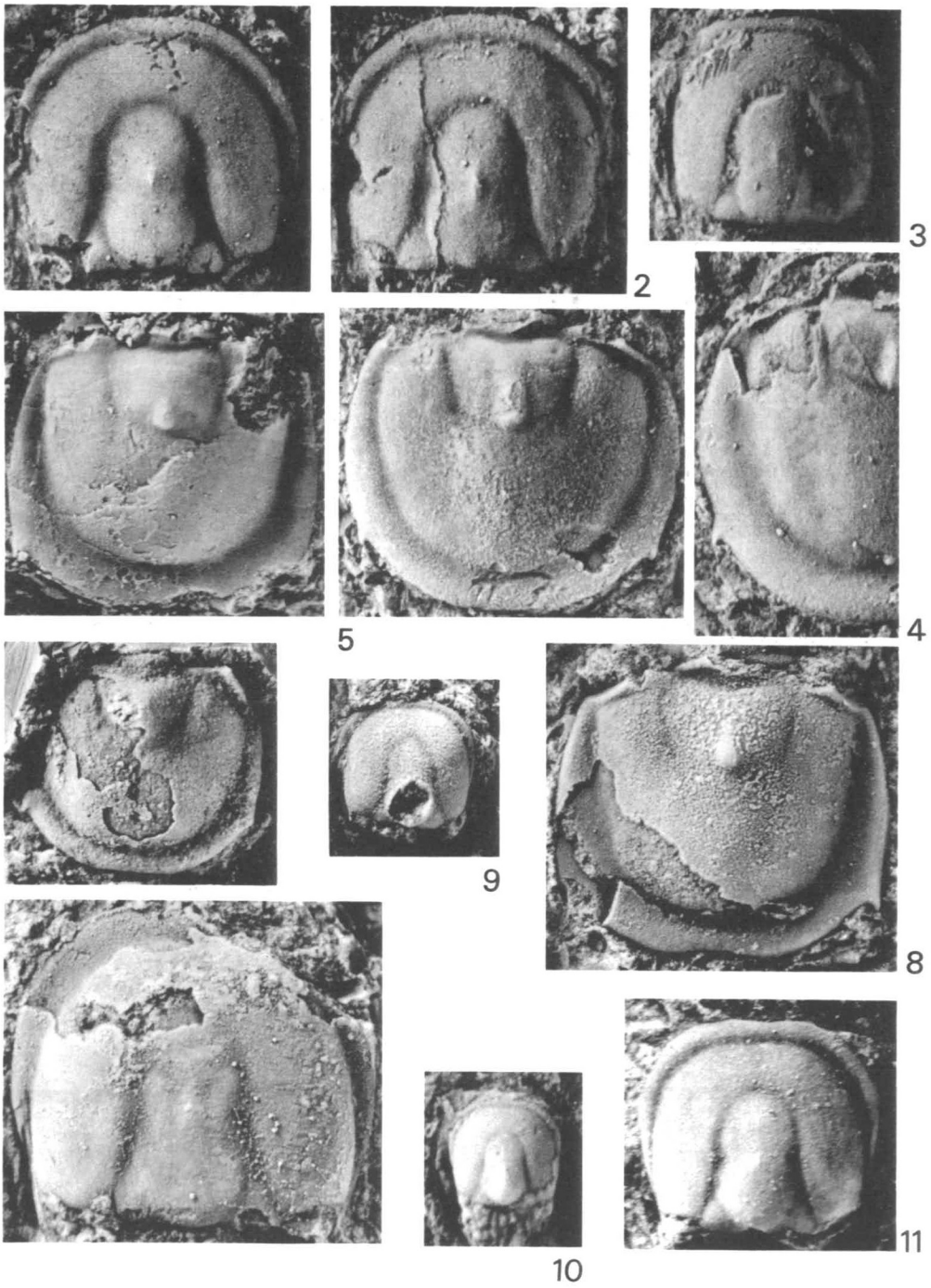

1
2
3
4
5
6
7
8
9
10
11
12

PLATE 9

Figures 1-7 *Pseudagnostus bifax* sp. nov. .... page 75
All specimens from the Black Mountain section

Figure 1 CPC 11596, **holotype,** cephalon preserved with shell and showing almost total effacement; length 3.75 mm; horizon K116; x15. Even the marginal furrow is partly effaced anteriorly.

Figure 2 CPC 11597, latex cast from parietal cephalic mould; length 3.70 mm; horizon K116; x15.

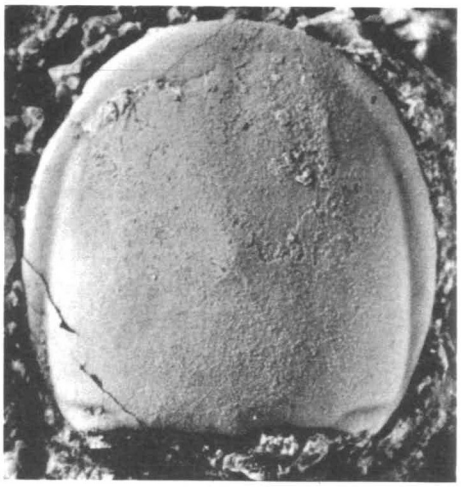
Figure 3 CPC 11598, exfoliated cephalon showing traces of the caecal network of the acrolobe, and almost effaced axial furrows; length 3.60 mm; horizon K116; x14.

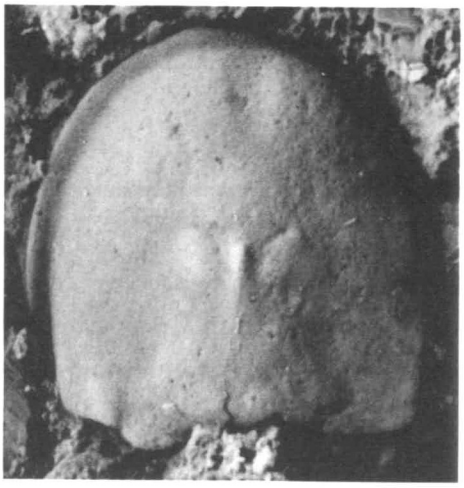
Figure 4 CPC 11599, exfoliated cephalon showing traces of parietal morphology; length 3.60 mm; horizon K117; x13.

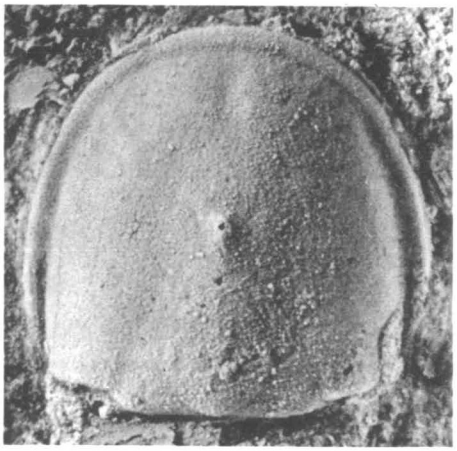
Figure 5 CPC 11600, exfoliated cephalon as above; length 3.30 mm; horizon K117, x14.

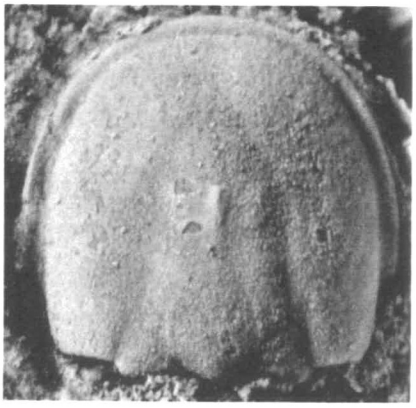
Figure 6 CPC 11601, testaceous, featureless cephalon; length 2.95 mm; horizon K118; x14.

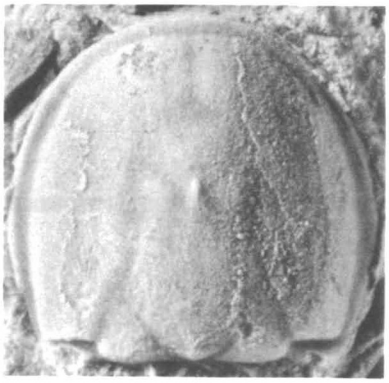
Figure 7 CPC 11602, exfoliated cephalon showing axial node sited well forwards anteriorly, and the appreciable elevation of the rear of the posterior lobe; length 2.10 mm; horizon K118; x14.

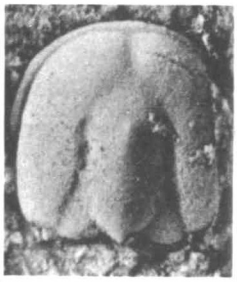

1


2


3


4


5


7

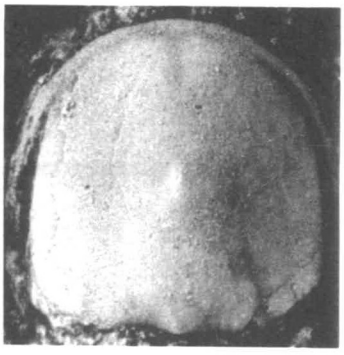

6

PLATE 10

Figures 1-5 *Pseudagnostus bifax* sp. nov. .... page 75
All specimens from the Black Mountain section

Figure 1 CPC 11662, large, mainly exfoliated pygidium showing general shape of shield, very small posterolateral spines, and parietal morphology which includes traces of the intranotular ridges; length (Lp_2) 4.00 mm; horizon K116; x14.

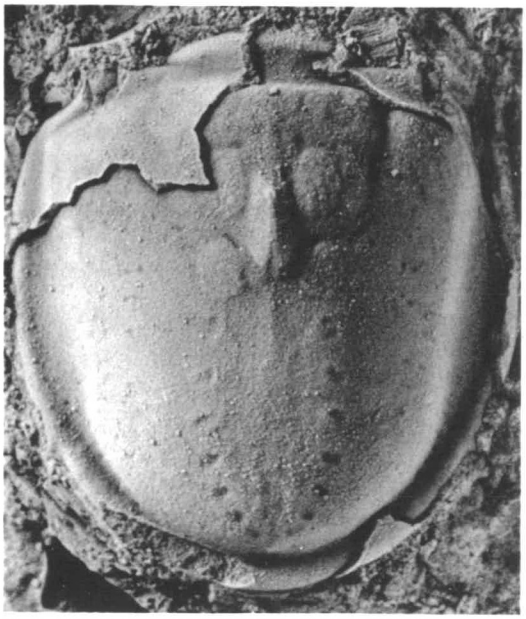
Figure 2 CPC 11667, exfoliated pygidial parietal surface showing deployment of muscle scar impressions and notulae; length (Lp_2) 5.15 mm; horizon K117; x14. The specimen has traces of ten metameres, duplicated notulae on metameres 4-8, a bifid and bilobed axial glabellar node, and a faintly scrobiculate acrolobe.

Figure 3 CPC 11656, testaceous pygidium, slightly compressed; length (Lp_1) 3.85 mm; horizon K116; x15.

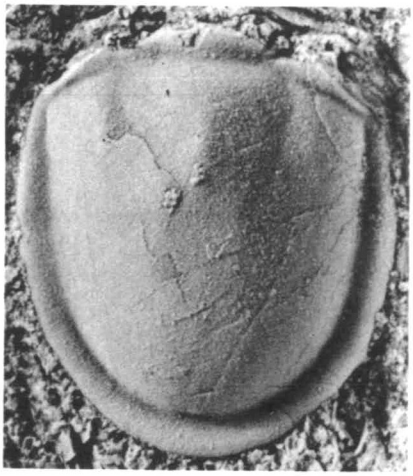
Figure 4 CPC 11649, testaceous pygidium having a regular shape; length (Lp_2) 3.20 mm; horizon K116; x14.

Figure 5 CPC 11668, parietal surface showing raised muscle scar impressions from metamer 4 rearwards, and intranotular ridges defined especially proximal to the axial node; horizon K117; x14.

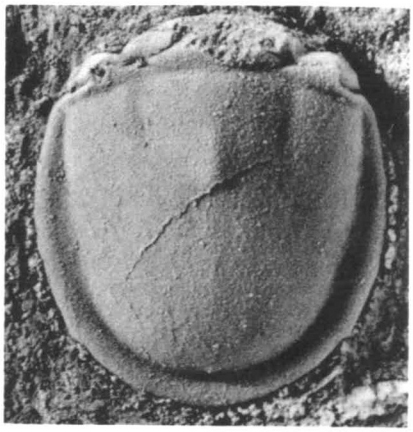
1



2



3



4

5

PLATE 11

Figures 1-8 *Pseudagnostus papilio* Shergold, 1972 .... page 79
All specimens from the Black Mountain section

Figure 1 CPC 11669, small testaceous cephalon showing faint median preglabellar furrow, very narrow borders, and axial node sited well forwards; length 1.70 mm; horizon K121; x15.

Figure 2 CPC 11670, small testaceous cephalon showing relationship of axial glabellar node to anterior glabellar furrow; length 1.90 mm; horizon K121; x14.

Figure 3 CPC 11671, small exfoliated cephalon; length 2.05 mm; horizon K121; x14.

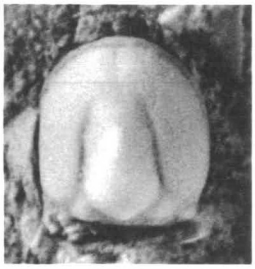
Figure 4 CPC 11672, considerably larger exfoliated cephalon showing parietal morphology and extremely narrow borders; length 3.85 mm; horizon K123; x16.

Figure 5 CPC 11673, large exfoliated cephalon — detail showing parietal morphology of glabella, scrobiculate acrolobe, and very faint median preglabellar furrow; length 5.00 mm; horizon K124; x13.

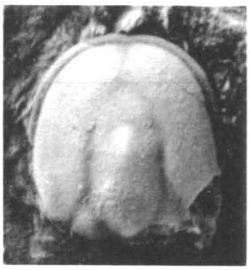
Figure 6 CPC 11674, testaceous pygidium with converging flanks; length (Lp_1) 2.40 mm; horizon K121; x15.

Figure 7 CPC 11676, partly exfoliated pygidium with faint traces of parietal morphology; length (Lp_1) 2.65 mm; horizon K121; x16.

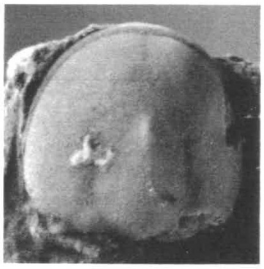
Figure 8 CPC 11675, testaceous pygidium; length (Lp_1) 2.60 mm; horizon K121; x 15.



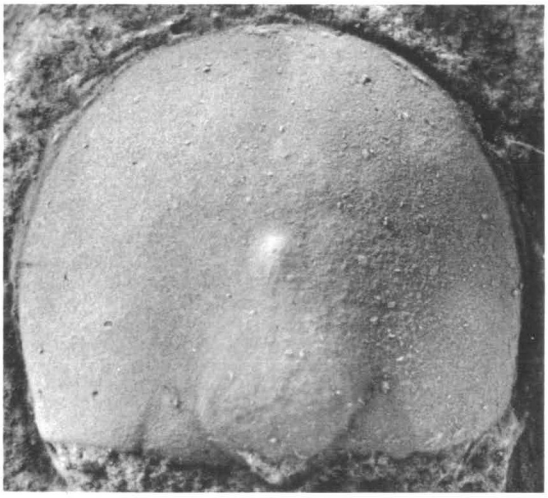
1



2



3

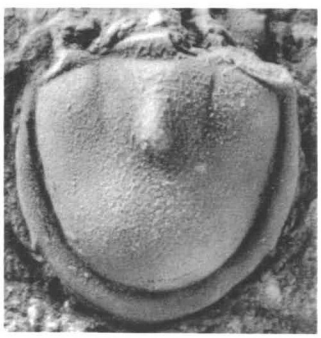


4

5

6

7



8

PLATE 12

Figures 1-7 *Pseudagnostus quasibilobus* sp. nov. .... page 94

Figure 1 CPC 11717, **holotype,** a partly exfoliated cephalon with subquadrate outline, traces of a median preglabellar furrow, and deepened median lateral glabellar furrows; faintly granulose shell; length 1.95 mm; Black Mountain horizon K138; x16.

Figure 2 CPC 11718, partly exfoliated incomplete cephalon, retaining traces of V-form anterolateral glabellar furrows, scrobiculate acrolobe; length 2.25 mm; Black Mountain horizon K139; x16.

Figure 3 CPC 11719, partly exfoliated cephalon as above, granulose shell; length 2.45 mm; Black Mountain horizon B510b; x16.

Figure 4 CPC 11720, latex cast from fragment of cephalic mould; Black Mountain horizon K139; x16.

Figure 5 CPC 11723, testaceous pygidium assigned to this species with posteriorly placed posterolateral spines and subquadrate outline; length (Lp_1) 2.15 mm; Black Mountain horizon K138; x15.

Figure 6 CPC 11722, large exfoliated pygidium showing faint shell-filled notulae and prominent third pair of axial muscle scars encompassed by axial furrows; Black Mountain horizon K138; x16.

Figure 7 CPC 11721, small testaceous pygidium; length (Lp_1) 1.30 mm; Mount Ninmaroo horizon K169; x20.

Figures 8-12 *Pseudagnostus orbiculatus* sp. nov. .... page 73

Figure 8 CPC 11592, exfoliated cephalon showing weak V-form curvilinear anterolateral glabellar furrows, presence of median preglabellar furrow, narrow borders; Black Mountain horizon K138; x16.

Figure 9 CPC 11591, **holotype,** exfoliated cephalon showing parietal morphology; length 2.90 mm; Dribbling Bore horizon K187; x16.

Figure 10 CPC 11593, latex cast from small partly exfoliated pygidium having subcircular acrolobe and posterolateral spines level with rear of deuterolobe; length (Lp_2) 1.60 mm; Black mountain horizon B510; x15.

Figure 11 CPC 11594, partly exfoliated pygidium showing overall shape of shield; length (Lp_1) 2.60 mm; Black Mountain horizon K138; x15.

Figure 12 CPC 11595, exfoliated incomplete pygidium showing subcircular acrolobe; length (Lp_2) 2.10 mm; Black Mountain horizon B510b; x16.

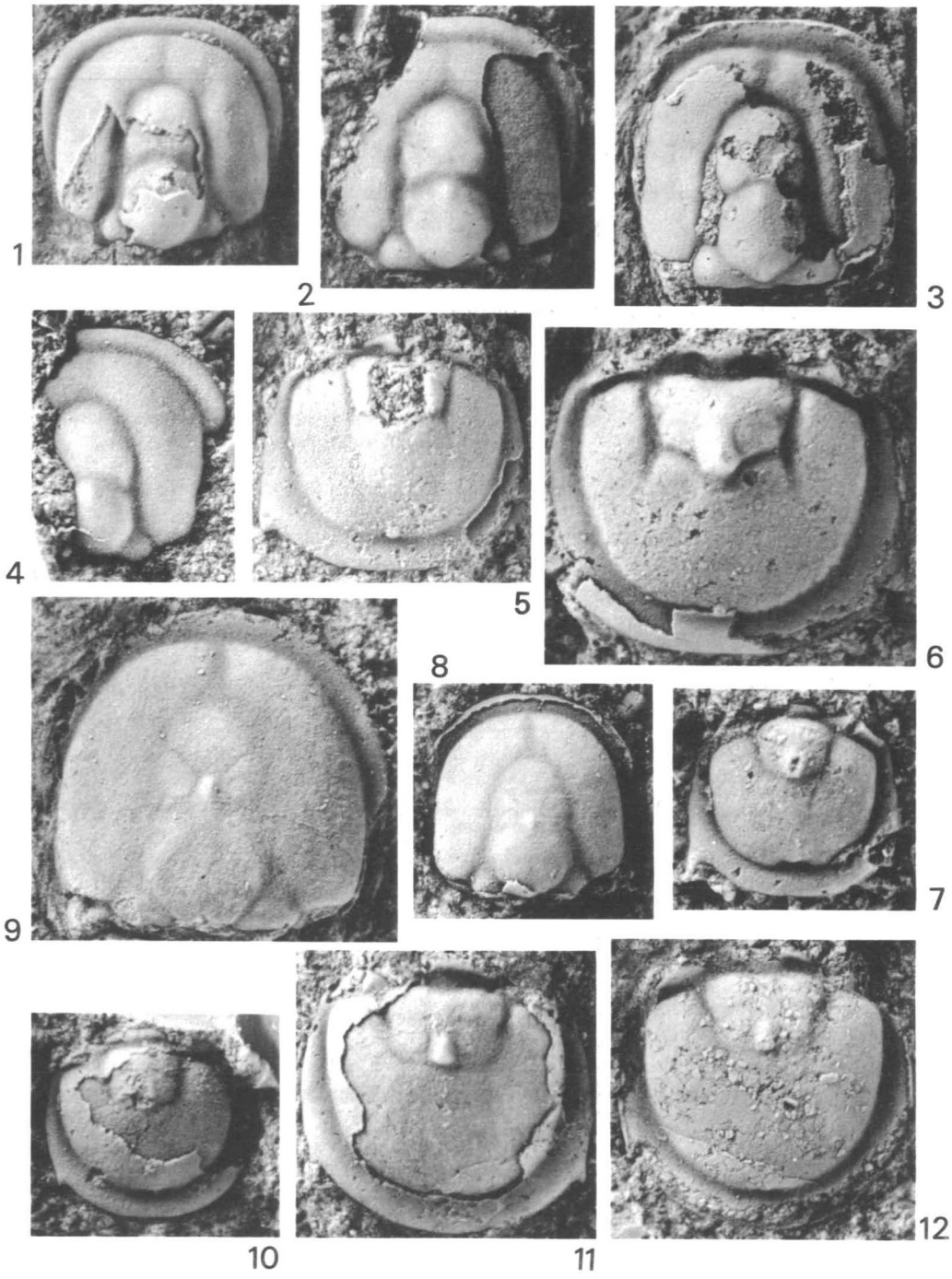

1
2
3
4
5
6
8
9
7
10
11
12

PLATE 13

Figures 1-6 *Geragnostus* (*Strictagnostus*) *chronius* subgen. et sp. nov. .... page 54
All specimens from the Black Mountain section

Figure 1 CPC 11729a, exfoliated cephalon showing subquadrate outline, anteriorly tapering acrolobe lacking median preglabellar furrow, broad deliquiate marginal furrows, and linear transverse anterior glabellar furrow; length 2.95 mm; horizon K117; x14.

Figure 2 CPC 11729b, latex cast from above mould; x14.

Figure 3 CPC 11730, exfoliated cephalon; length 2.75 mm; horizon K123; x15.

Figure 4 CPC 11731, exfoliated cephalon with scrobiculate acrolobe; length 3.60 mm; horizon K131; x14.

Figure 5 CPC 11732, **holotype**, small exfoliated pygidium with faintly constricted acrolobe and short (sag.) axis showing muscle scar impressions; length (Lp_2) 1.50 mm; horizon K117; x14.

Figure 6 CPC 11733, small exfoliated pygidium as above; length (Lp_2) 1.50 mm; horizon K116; x14.

Figures 7-8, 12 *Geragnostus* (*Micragnostus*) cf. *intermedius* Palmer, 1968 .... page 52
All specimens from the Black Mountain section

Figure 7 CPC 11727, partly exfoliated cephalon lacking median preglabellar furrow, narrow non-deliquiate marginal furrows, linear transverse anterior glabellar furrow; length 2.20 mm; horizon K139; x16.

Figure 8 CPC 11728b, latex cast from mould of pygidial fragment; horizon K139; x16.

Figure 12 CPC 11728a, pygidial fragment displaying axial morphology; length (est. Lp_2) 1.50 mm; x16.

Figures 9-11 *Geragnostus* (*Micragnostus*) cf. *acrolebes* Shergold, 1972 .... page 52
All specimens from the Black Mountain section

Figure 9 CPC 11724, exfoliated cephalon showing condition of marginal furrows and acrolobe, and glabellar morphology; length 2.00 mm; horizon K119; x14.

Figure 10 CPC 11725, silicified pygidial fragment showing morphology of axis and acrolobe; horizon B507a″; x14.

Figure 11 CPC 11726, exfoliated pygidial fragment; horizon K119; x14.

Figures 13-15 *Connagnostus conspectus* sp. nov. .... page 57
All specimens from the Black Mountain section

Figure 13 CPC 11734, **holotype**, an exfoliated pygidium with strongly constricted acrolobe, deliquiate marginal furrows, and long (sag.) axis; length (Lp_2) 2.10 mm; horizon K119; x14.

Figure 14 CPC 11735, exfoliated cephalon showing deliquiate marginal furrows and rounded anterior glabellar lobe; length 2.25 mm; horizon K119; x14.

Figure 15 CPC 11736, exfoliated incomplete cephalon with scrobiculate acrolobe; horizon K117; x14.

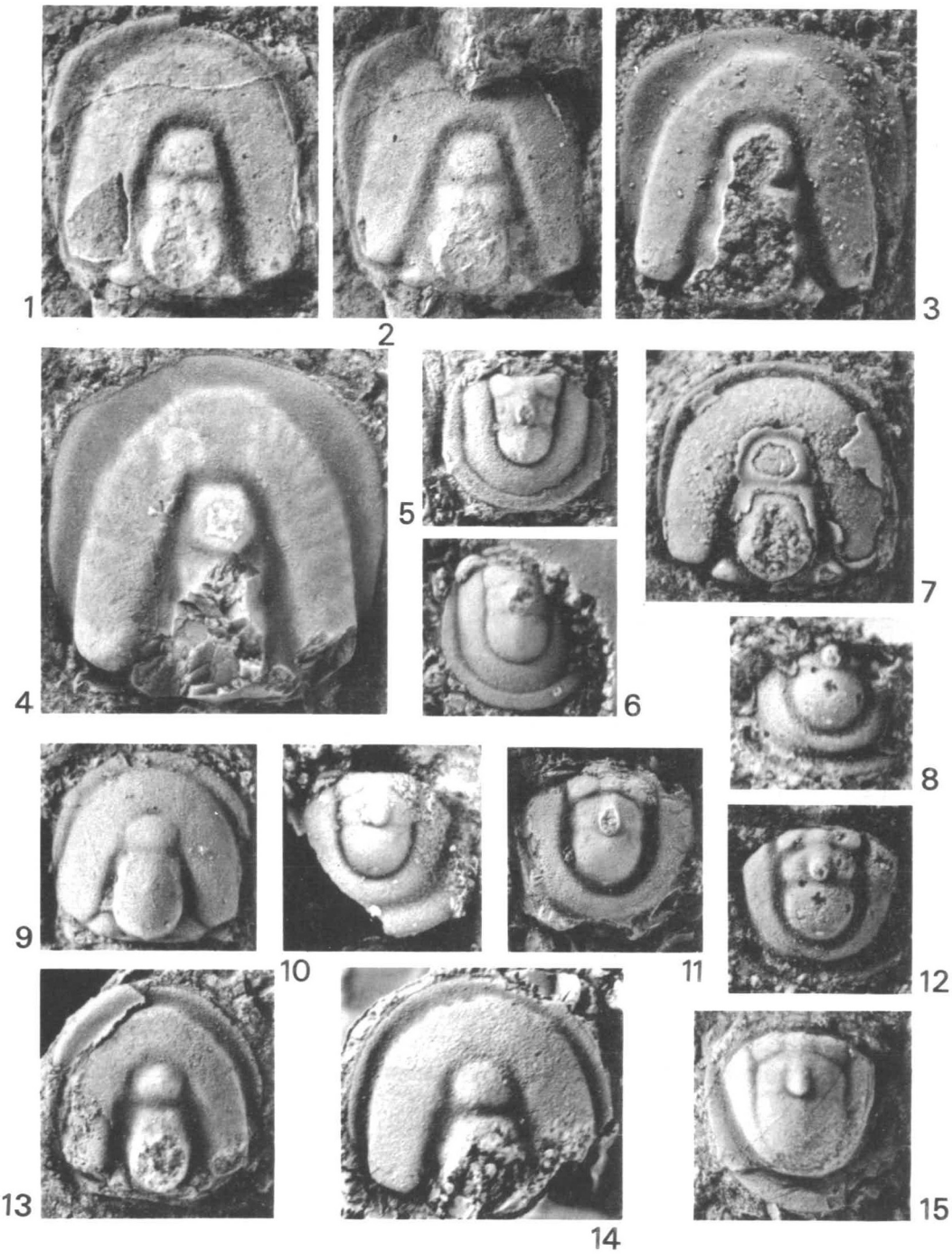

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

PLATE 14

Figures 1-6 *Lotagnostus* (*Trilobagnostus*) *irretitus* sp. nov. .... page 49
All specimens from the Black Mountain section

Figure 1 CPC 11518, **holotype,** a testaceous cephalon bearing anastomosing lirae; length 3.45 mm; horizon K121; x15. The glabella is defined only at the rear.

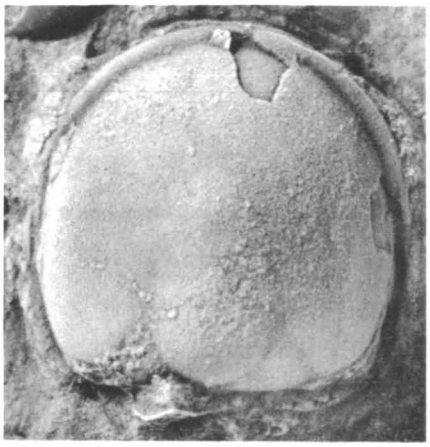
Figure 2 CPC 11519, cephalon as above with araneavelate prosopon on right side of acrolobe; length 3.60 mm; horizon K121; x16.

Figure 3 CPC 11520, latex cast from parietal surface showing furrowing and pattern of muscle scars similar to that of Agnostidae but distinct from Pseudagnostinae; horizon K121; x14.

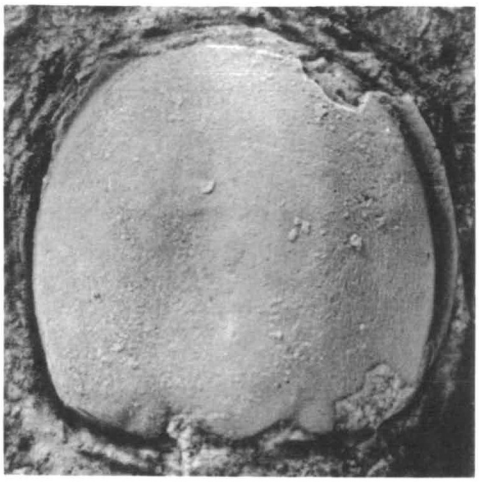
Figure 4 CPC 11521, incomplete and partly exfoliated cephalon; horizon K118; x14.

Figure 5 CPC 11522, incomplete exfoliated pygidium with deep axial furrows and well defined lobation; horizon K119; x14.

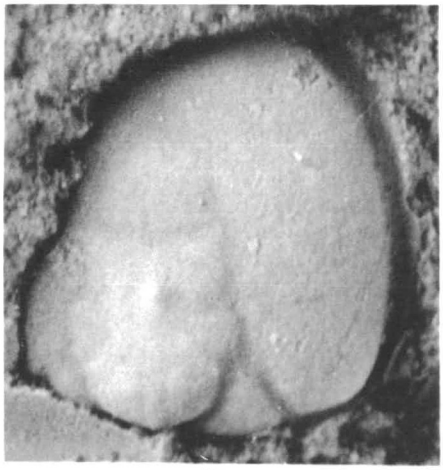
Figure 6 CPC 11523, large exfoliated pygidium showing parietal morphology; length (Lp_2) 4.20 mm; horizon K121; x15.



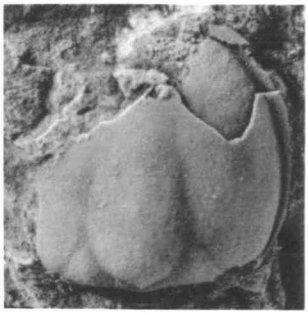
1



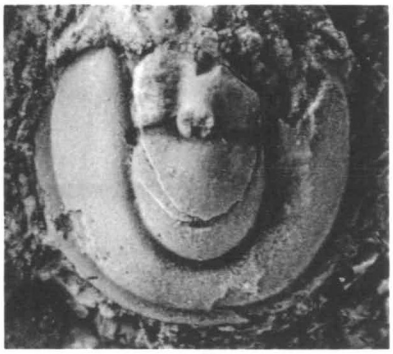
2



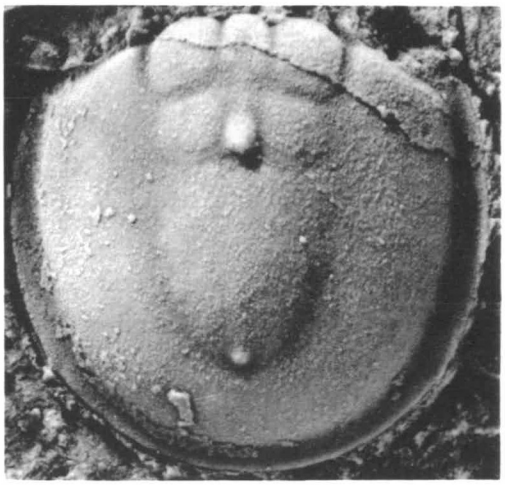
3



4



5



6

PLATE 15

Figures 1-4 *?Prosaukia absona* sp. nov. .... page 117
All specimens from the Black Mountain section

Figure 1 CPC 11739, latex mould of holaspid cranidial fragment showing traces of caecal network associated with postocular area; horizon K138; x12.

Figure 2 CPC 11738, **holotype,** incomplete partly exfoliated cranidium; horizon K138; x12.

Figure 3 CPC 11740, incomplete holaspid pygidium, partly exfoliated, showing lirations and granulation; horizon B510; x6.

Figure 4 CPC 11741, exfoliated librigena with advanced genal spine; horizon K139; x12.

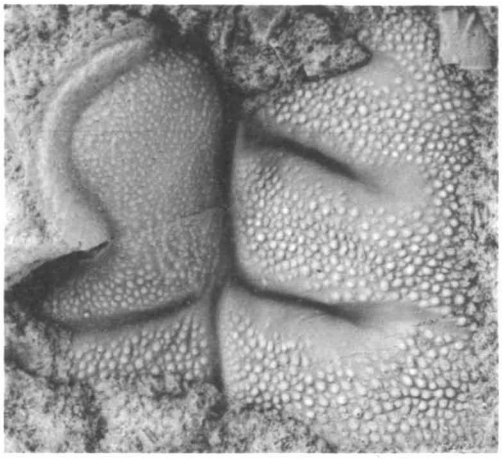
Figures 5-6 *Prosaukia* sp. A .... page 111

Figure 5 CPC 11742, incomplete exfoliated cranidial fragment, lateral view; Black Mountain section, horizon K112; x6.

Figure 6 CPC 11742, same specimen in dorsal aspect; as above; x6.

Figure 7 *?Prosaukia nema* sp. nov. .... page 113

Figure 7 CPC 11737, **holotype,** exfoliated cranidium; Dribbling Bore section, horizon K186; x8.

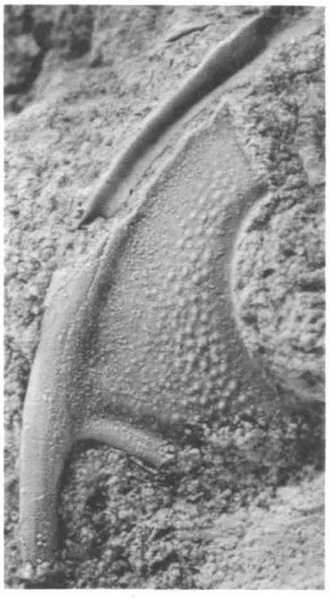


1

2

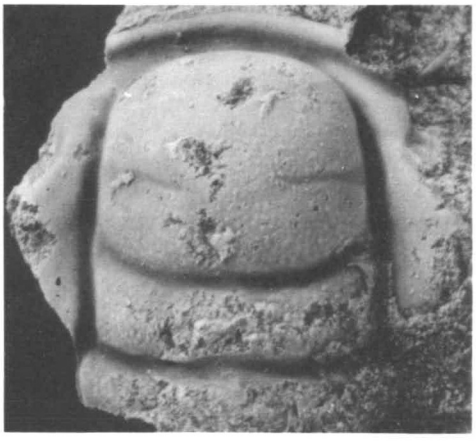
3

5



4

6



7

PLATE 16

Figures 1-6 *?Prosaukia cornigra* sp. nov. .... page 114
All specimens from the Black Mountain section

Figure 1 CPC 11746, latex cast from exfoliated pygidial fragment; horizon K130; x4.

Figure 2 CPC 11745, latex cast from exfoliated cranidial fragment showing extent of nuchal spine; horizon K130; x4.

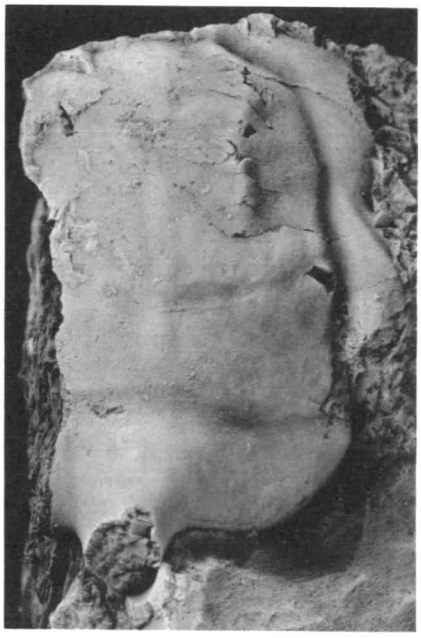
Figure 3 CPC 11747, exfoliated cranidial fragment showing transversely connected pre-occipital furrows, and small sagittally sited tubercle anterior to nuchal spine base; horizon K130; x4.

Figure 4 CPC 11747, lateral view of above specimen showing orientation of nuchal spine base; x4.

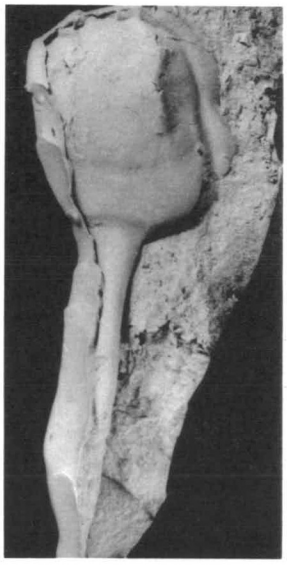
Figure 5 CPC 11744, exfoliated librigena showing merged posterior and lateral marginal furrows continuing into genal spine base; horizon K130; x2.

Figure 6 CPC 11743, **holotype,** an exfoliated cranidium with broken nuchal spine whose base is visibly drawn from the anterior portion of the occipital ring; horizon K130; x2.

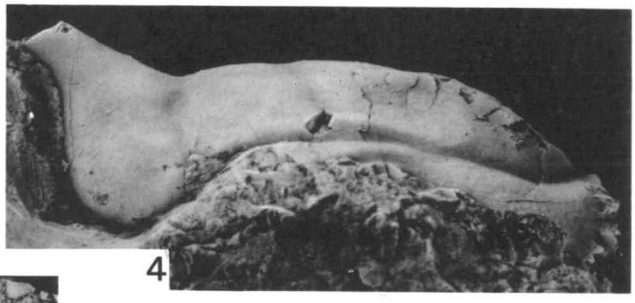
1



3

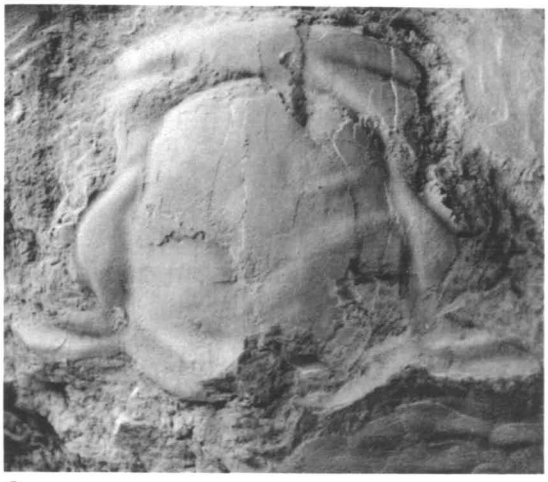


2



4

5



6

PLATE 17

Figures 1-7 *Sinosaukia impages* sp. nov. .... page 133
All specimens from the Black Mountain section

Figure 1 CPC 11771a, **holotype,** an incomplete exfoliated cranidium showing typical glabellar form; horizon K130; x8.

Figure 2 CPC 11771b, latex cast from mould of **holotype** showing extent of palpebral lobes; horizon K130; x8.

Figure 3 CPC 11772, detail of exfoliated cranidial fragment showing part of anterior cranidial border; horizon K128; x8.

Figure 4 CPC 11773, testaceous librigenal fragment with large perforated granules; horizon K131; x8.

Figure 5 CPC 11774, detail of testaceous cranidial fragment showing relationship of glabella to anterior cranidial border, and typical prosopon; horizon K135; x8.

Figure 6 CPC 11775, further detail of anterior cranidial border from latex cast of an external mould; horizon K130; x8.

Figure 7 CPC 11776, a poorly preserved pygidial fragment retaining shell; horizon K131; x6.

Figures 8-9 *Sinosaukia* sp. indet. .... page 134

Figure 8 CPC 11777, oblique lateral view of cranidial fragment showing an anterolateral notch not seen in *S. impages;* Black Mountain section, horizon K138; x12.

Figure 9 CPC 11778, exfoliated cranidial fragment; Black Mountain section, horizon B510; x8.

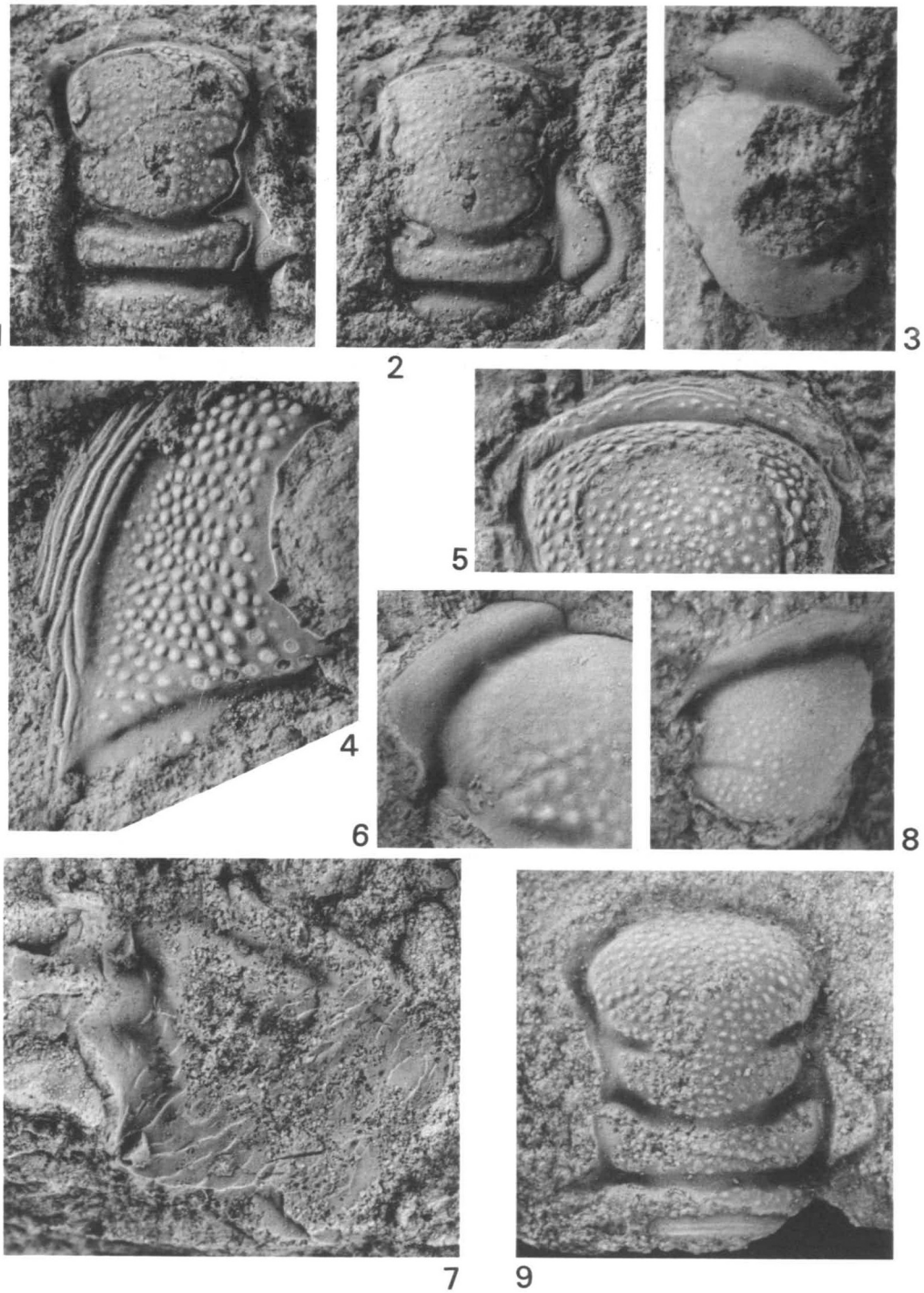

1
2
3
4
5
6
8
7
9

PLATE 18

Figures 1-6 *Lophosaukia torquata* Shergold, 1972 .... page 135
All specimens from the Black Mountain section

Figure 1 CPC 11779, eroded and silicified cranidium showing extent of posterolateral limbs and doublure; horizon B507a″; x4.

Figure 2 CPC 11779, as above, anterior profile; x4.

Figure 3 CPC 11779, as above, lateral profile; x4.

Figure 4 CPC 11780, anterior view of incomplete cranidium showing well preserved adventrally directed cranidial border; horizon K117; x8.

Figure 5 CPC 11781, librigena retaining most of test, showing lirate border and stout genal spine; horizon K117; x8.

Figure 6 CPC 11782, latex cast from exfoliated pygidial mould, showing punctate surface and degree of segmentation; horizon K117; x8.

Figures 7-9 *Lophosaukia acuta* sp. nov. .... page 137
Specimen from the Black Mountain section

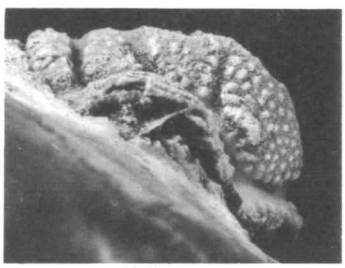
Figure 7 CPC 11783, **holotype,** an exfoliated cranidium showing to advantage the anteriorly tapering glabella and long (tr.) posterolateral limbs; horizon K116; x6.

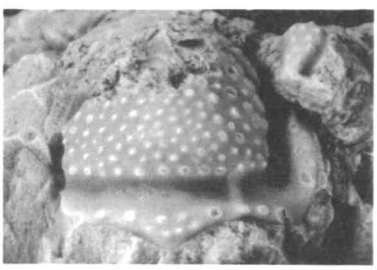
Figure 8 CPC 11783, as above, lateral view; x6.

Figure 9 CPC 11783, as above, anterior view; x6.

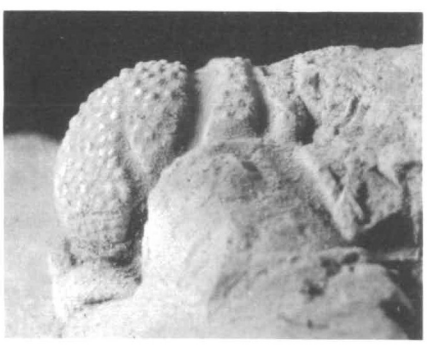

1


2

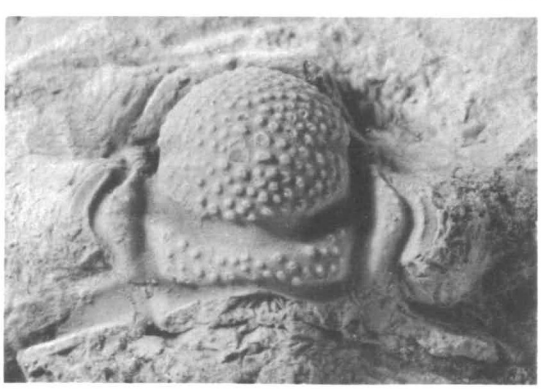

3


4


5


7


6


8

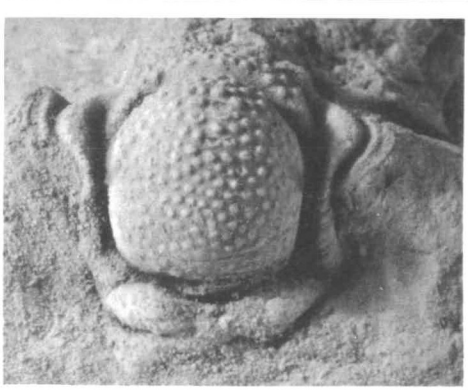

9

PLATE 19

Figure 1 *Lophosaukia* sp. D .... page 139

Figure 1 CPC 11784, exfoliated cranidium showing anteriorly expanded glabella and pustulose prosopon; Mount Datson section, horizon K175; x14.

Figures 2, 6 *Lophosaukia* sp. A .... page 138

Figure 2 CPC 11786, exfoliated cranidial fragment; Black Mountain section, horizon K124; x6.

Figure 6 CPC 11787, exfoliated librigenal fragment very similar to that of type species; Black Mountain section, horizon K124; x8.

Figures 3-5 *Lophosaukia* sp. B. .... page 138
All specimens from the Dribbling Bore section

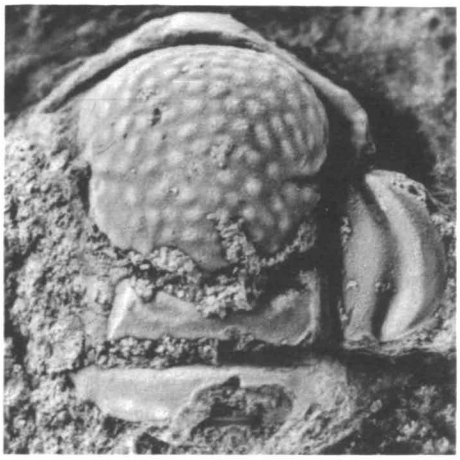
Figure 3 CPC 11788, latex cast from external mould of small librigena showing long anterolateral prong; horizon B777; x8.

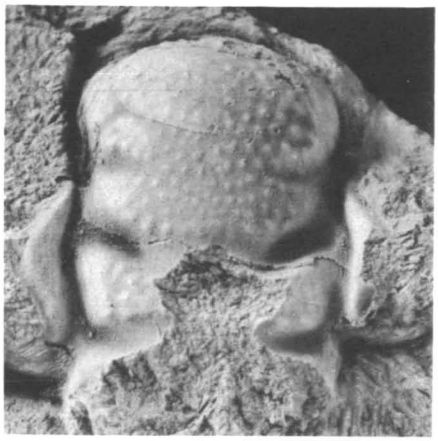
Figure 4 CPC 11789, exfoliated librigena showing anterolateral prong and also a punctate surface; horizon K187; x6.

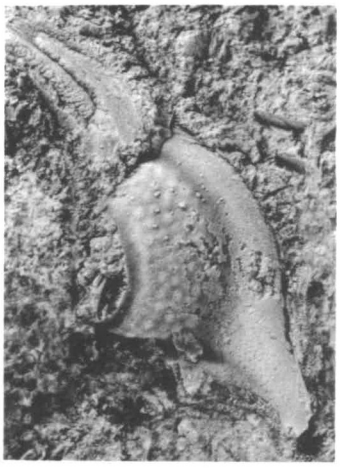
Figure 5 CPC 11790, fragment of exfoliated librigena showing punctae and, faintly, caecal network; horizon K189; x4.

Figure 7 *Lophosaukia* sp. C .... page 139

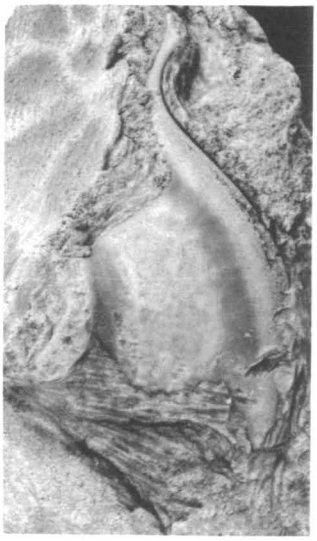
Figure 7 CPC 11785, latex cast from incomplete cranidial mould; Black Mountain section, horizon K139; x16.


1


2


3


4


5


6

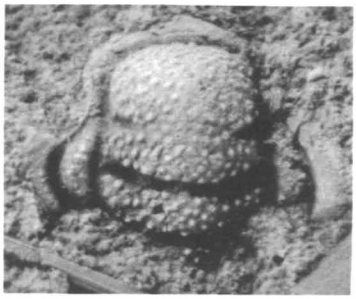

7

PLATE 20

Figures 1-5 *Anderssonella beauchampi* sp. nov. .... page 119
All specimens from the Black Mountain section

Figure 1 CPC 11749, **holotype,** an incomplete testaceous cranidium showing late holaspid glabellar form, prosaukioid preglabellar ridge, and anteriorly sited palpebral lobes; horizon K139; x6.

Figure 2 CPC 11750, exfoliated early holaspid cranidium; horizon K139; x14.

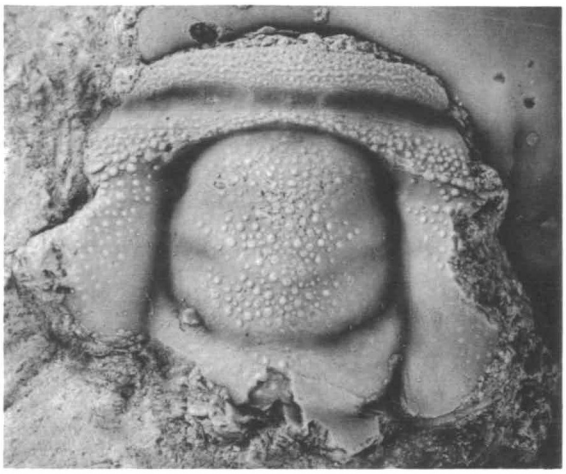
Figure 3 CPC 11751, exfoliated early holaspid cranidium showing a parallel-sided glabella and presence of bacculae; horizon K139; x14.

Figure 4 CPC 11752, detail of testaceous cranidial fragment showing degree of granulation; horizon K139; x12.

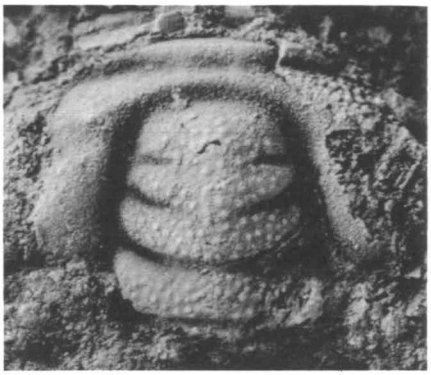
Figure 5 CPC 11754, early holaspid pygidium retaining vestige of shell and showing pleural segmentation; horizon K139; x7.

Figure 6 *Anderssonella eweyi* sp. nov. .... page 122

Figure 6 CPC 11753, large late holaspid pygidial fragment showing configuration of pleura and extent of doublure; Black Mountain section, horizon K143; x4.



1



2

4

3

6

5

PLATE 21

Figures 1-2 *Anderssonella beauchampi* sp. nov. .... page 119
Specimen from the Black Mountain section

Figure 1 CPC 11755a, exfoliated librigena showing details of caecal network, which includes prominent genal diverticulum running concentric to subocular groove; horizon K139; x16.

Figure 2 CPC 11755b, latex cast from mould of previous specimen showing additional detail; x16.

Figures 3-4 *Galerosaukia ptyxis* sp. nov. .... page 126
Both specimens from the Black Mountain section

Figure 3 CPC 11766, latex cast from parietal surface of librigenal fragment showing details of caecal network; horizon K143; x8.

Figure 4 CPC 11767, partly exfoliated librigena with lirate lateral border and genal spine, showing some detail of caecal network; horizon K143; x4.

Figures 5-6 *Anderssonella eweyi* sp. nov. .... page 122
Both specimens from the Black Mountain section

Figure 5 CPC 11756, **holotype,** cranidial fragment showing diagnostic surface prosopon; horizon K143; x8.

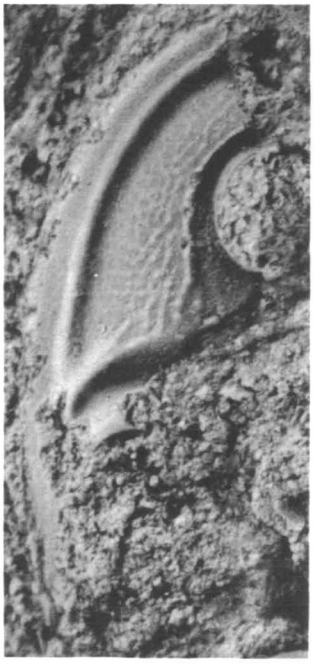
Figure 6 CPC 11757, latex cast from external mould of librigena showing posterior marginal furrow continuing well into genal spine base and isolated from lateral marginal furrow; horizon K144; x8.

Figures 7-9 *Galerosaukia* sp. .... page 127
All specimens from the Black Mountain section

Figure 7 CPC 11768, highly exfoliated cranidial fragment with punctate surface; horizon K137; x2.

Figure 8 CPC 11769, latex cast from external mould of librigenal fragment showing prominent duplicated genal diverticulum, and courses of marginal furrow; horizon K137; x4.

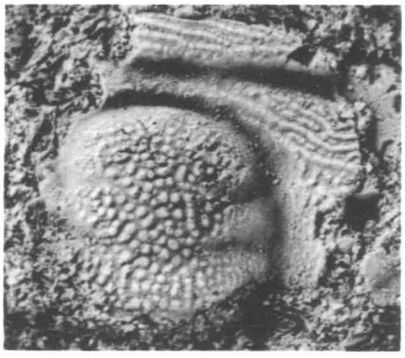
Figure 9 CPC 11770, exfoliated librigenal fragment showing detail of genal diverticulum; horizon K137; x6.


1

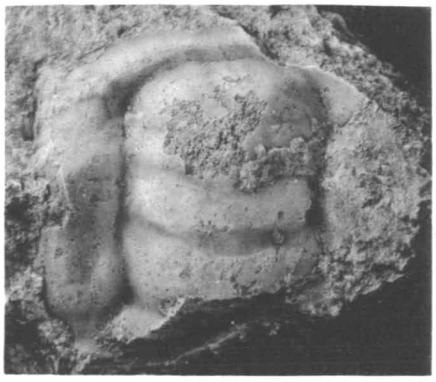

2

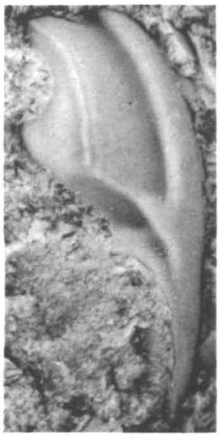

3


4


5


6


7


8


9

PLATE 22

Figures 1-5 *Galerosaukia galerita* sp. nov. .... page 124
All specimens from the Black Mountain section

Figure 1 CPC 11758, **holotype,** partly exfoliated incomplete cranidium showing typical upraised preglabellar ridge continuing across preocular areas, and laterally expanded preoccipital glabellar lobes; horizon K141; x8.

Figure 2 CPC 11759, exfoliated pygidial fragment showing prosaukioid shape; horizon K141; x8.

Figure 3 CPC 11760b, latex cast from exfoliated cranidium showing details of preglabellar ridge and its relationship to glabella; horizon K141; x12.

Figure 4 CPC 11760a, exfoliated cranidial fragment; horizon K141; x8.

Figure 5 CPC 11761, exfoliated librigena showing prominent genal diverticulum, and courses of lateral and posterior marginal furrows; horizon K141; x8.

Figures 6-9 *Galerosaukia ptyxis* sp. nov. .... page 126

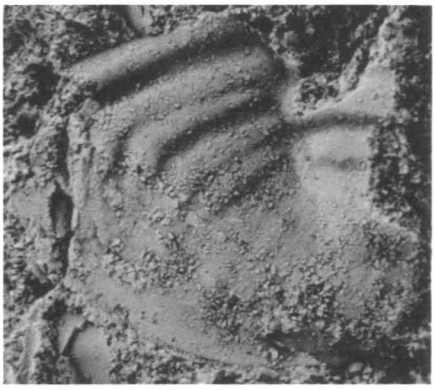
Figure 6 CPC 11765, librigena showing details of caecal network overlain by coarser surface liration; Mount Ninmaroo section, horizon K168; x8.

Figure 7 CPC 11764, partly exfoliated librigena, as above; Mount Ninmaroo section, horizon K168; x6.

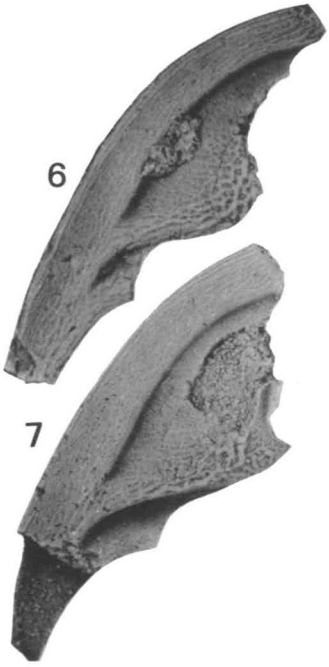
Figure 8 CPC 11762, **holotype,** partly exfoliated cranidium with typical prosopon, laterally expanded preoccipital lobes, fixigenal bacculae, and pitted axial furrows; Mount Ninmaroo section, horizon K168; x10.

Figure 9 CPC 11763, partly exfoliated cranidium, as above; Mount Ninmaroo section, horizon K169; x10.

1



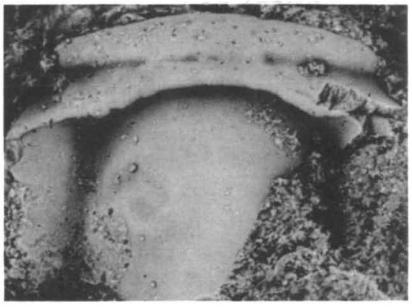
2



6

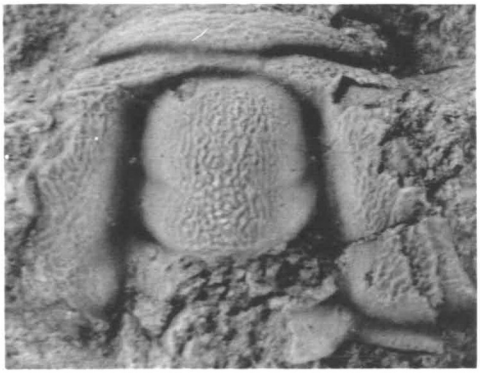
7

3

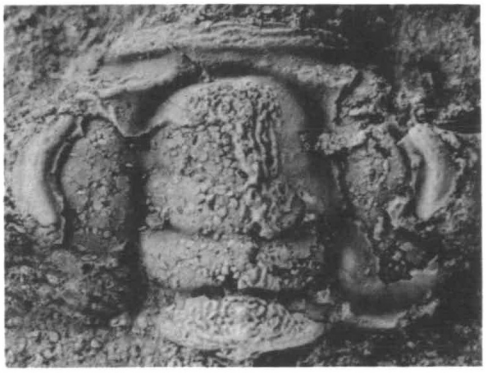


4

5



8



9

PLATE 23

Figures 1-7 *?Calvinella solitaria* sp. nov. .... page 141
All specimens from the Black Mountain section

Figure 1 CPC 11791, **holotype,** silicified cranidium retaining faint granulosity and nuchal node; horizon K145; x8.

Figure 2 CPC 11792, silicified librigenal fragment associated with cranidial fragment (CPC 11793) and a broken occipital ring which bears a small spine; lateral and posterior marginal furrows are confluent and genal spine small; horizon K145; x8.

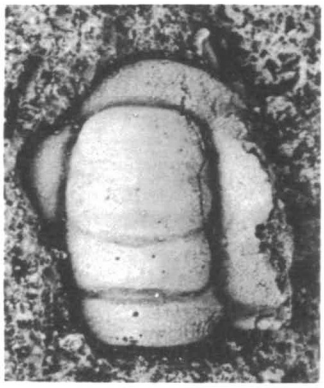
Figure 3 CPC 11793, silicified cranidial fragment in the association described above; horizon K145; x8.

Figure 4 CPC 11794, silicified pygidial fragment; horizon K145; x8.

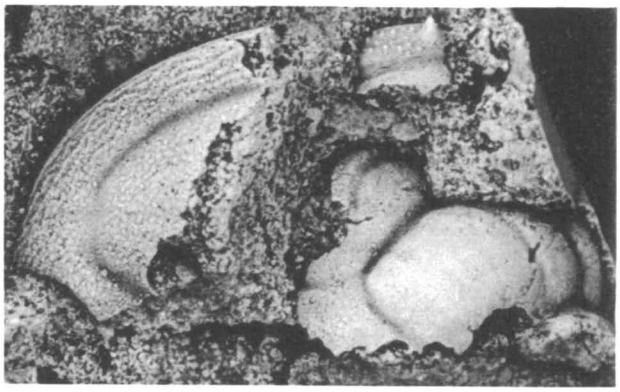
Figure 5 CPC 11795, latex cast from external mould of small cranidium showing a long nuchal spine, deep glabellar furrows, and long band-like posterolateral limbs; horizon K145; x8.

Figure 6 CPC 11795, as above, lateral aspect; x8.

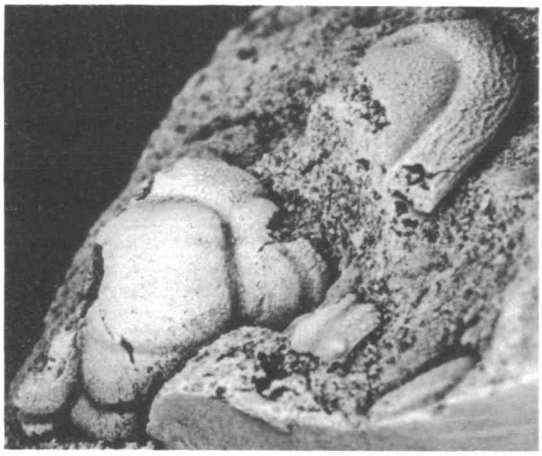
Figure 7 CPC 11796, latex cast from external mould of an associated early holaspid librigena showing traces of caecal network, which may be referable to *Lophosaukia;* horizon K145; x8.



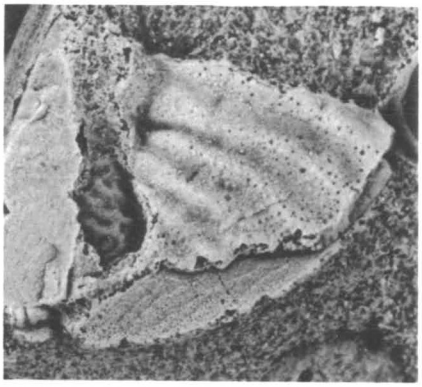
1



2



3



4

7

6

5

PLATE 24

Figures 1-9 *Mictosaukia perplexa* sp. nov. .... page 144
All specimens except Figure 6 from the Mount Datson section

Figure 1 CPC 11797, largely exfoliated cranidium showing long (tr.) posterolateral limbs; horizon K180; x3.

Figure 2 CPC 11798, exfoliated cranidial fragment showing relationship of preglabellar area to glabella; horizon K178; x4.

Figure 3 CPC 11799, latex cast from exfoliated librigenal fragment showing laterally crenulated margin; horizon K178; x6.

Figure 4 CPC 11800, testaceous librigena with short genal spine and coarse lirate prosopon; horizon K178; x8.

Figure 5 CPC 11801, latex cast from partly exfoliated librigena with crenulated lateral margin becoming apparent; horizon K178; x8.

Figure 6 CPC 11802, detail of surface of latex cast from exfoliated librigenal fragment; Dribbling Bore, horizon K192; x14.

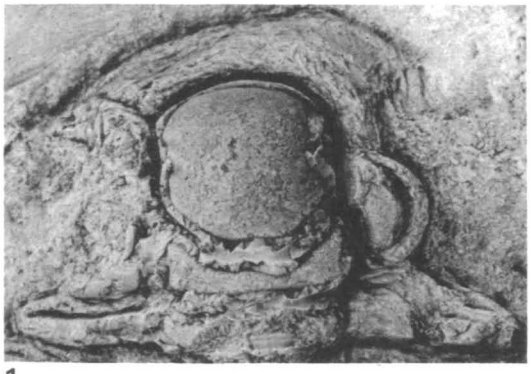
Figure 7 CPC 11803, exfoliated cranidial fragment, lateral aspect; horizon K178; x4.

Figure 8 CPC 11798, exfoliated cranidial fragment, lateral aspect; horizon K178; x4.

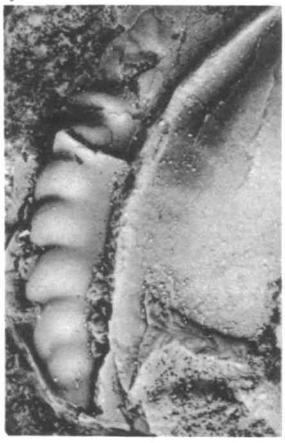
Figure 9 CPC 11805, **holotype,** partly exfoliated cranidium; horizon K178; x6.

Figure 10 *Lophosaukia* sp. D

Figure 10 CPC 11804, exfoliated pygidial fragment, paucisegmented and transversely triangular; Mount Datson section, horizon K178; x8.

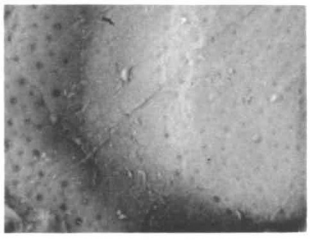

1


2


3


4


5


6


7


8


9

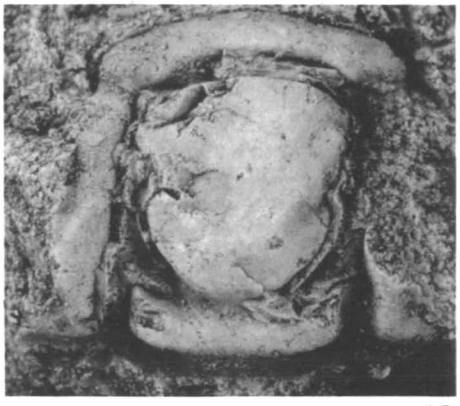

10

PLATE 25

Figures 1-6 *Caznaia squamosa* sp. nov. .... page 129
All specimens from the Dribbling Bore section

Figure 1 CPC 11806, **holotype,** testaceous cranidium showing features of preglabellar area, position of palpebral lobes, and long (tr.) triangular posterolateral limbs; horizon K106; x3.

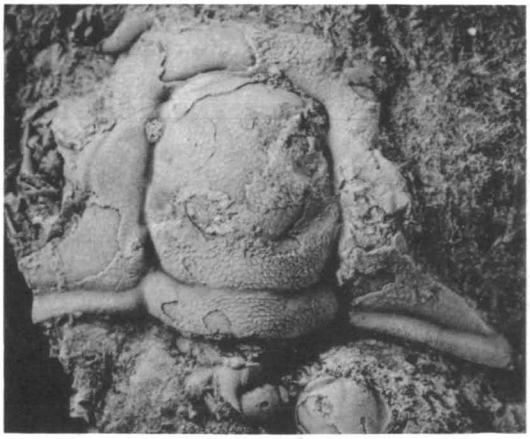
Figure 2 CPC 11807, partly exfoliated cranidium showing further detail of preglabellar area; horizon K106; x5.

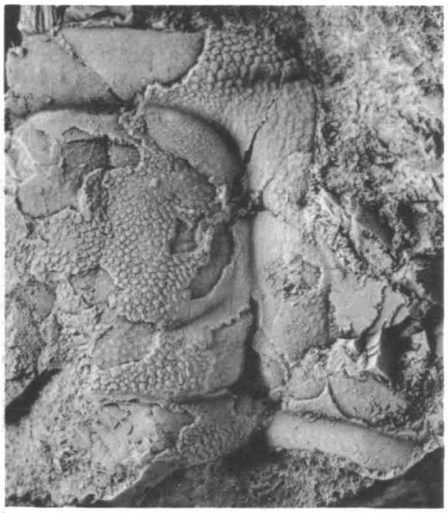
Figure 3 CPC 11808, largely exfoliated cranidium showing transversely continuous anterior cranidial marginal furrow; horizon K106; x5.

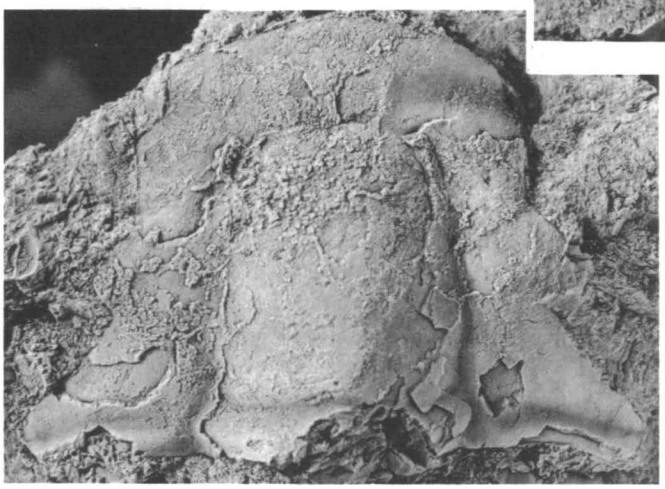
Figure 4 CPC 11809, testaceous cranidium, coarsely granulose, lateral aspect; horizon K106; x9.

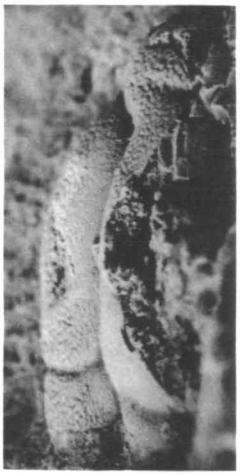
Figure 5 CPC 11809, as above, showing interrupted anterior cranidial marginal furrow when shell is preserved; horizon K106; x9.

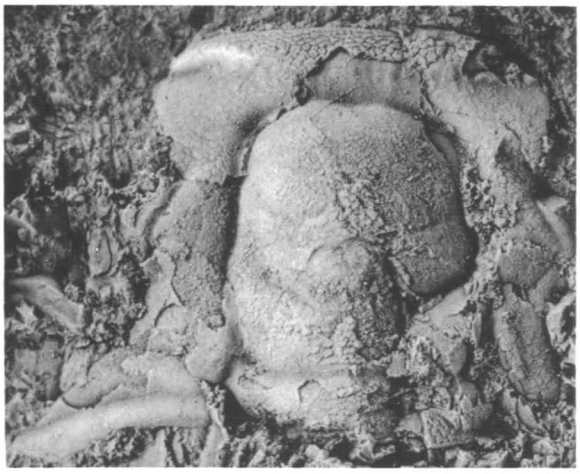
Figure 6 CPC 11810, partly exfoliated cranidium showing traces of glabellar furrowing; horizon K106; x5.


1


2


3


4


6

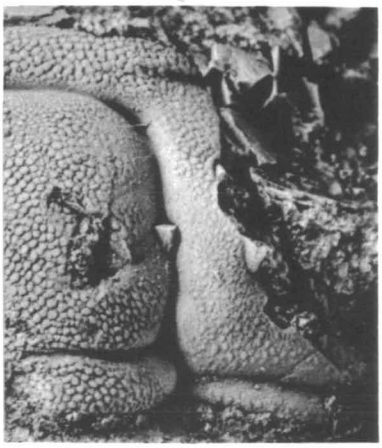

5

PLATE 26

Figures 1-6 *Caznaia squamosa* sp. nov. .... page 129
All specimens from the Black Mountain section

Figure 1 CPC 11811, mainly complete, but exfoliated, pygidium showing general shape and degree of segmentation; horizon K106; x4.5.

Figure 2 CPC 11812, exfoliated pygidial fragment showing caecal network; horizon K107; x4.5.

Figure 3 CPC 11813, latex cast of near-complete partly exfoliated pygidium showing extent of doublure; horizon K107; x8.

Figure 4 CPC 11814, latex cast from pygidial fragment; horizon K103; x8.

Figure 5 CPC 11815, exfoliated librigenal fragment with broad genal field and discernible caecal network; horizon K106; x4.5.

Figure 6 CPC 11816, latex cast from exfoliated librigena showing courses of lateral and posterior marginal furrows, similar to those of later Saukiidae; horizon K107; x8.

Figure 7 *Caznaia sectatrix* sp. nov. .... page 131

Figure 7 CPC 11822, exfoliated librigena with traces of caecal network; horizon K109; x8.

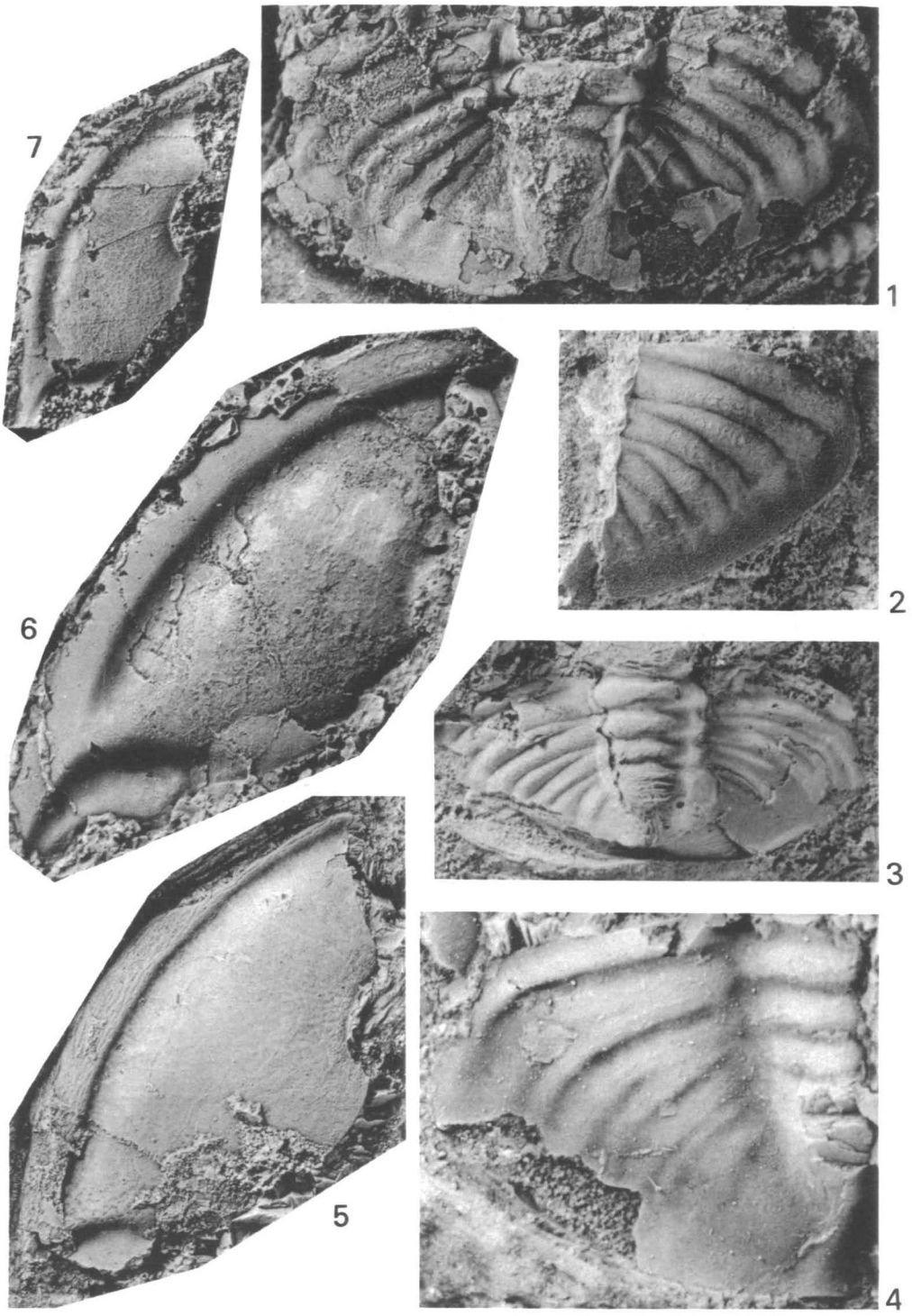

7
1
6
2
3
5
4

PLATE 27

Figures 1-6 *Caznaia sectatrix* sp. nov. .... page 131
All specimens from the Black Mountain section

Figure 1 CPC 11823, **holotype,** exfoliated cranidium showing small palpebral lobes, broad triangular posterolateral limbs, and narrow (tr., sag.) preglabellar area; horizon K111; x4.

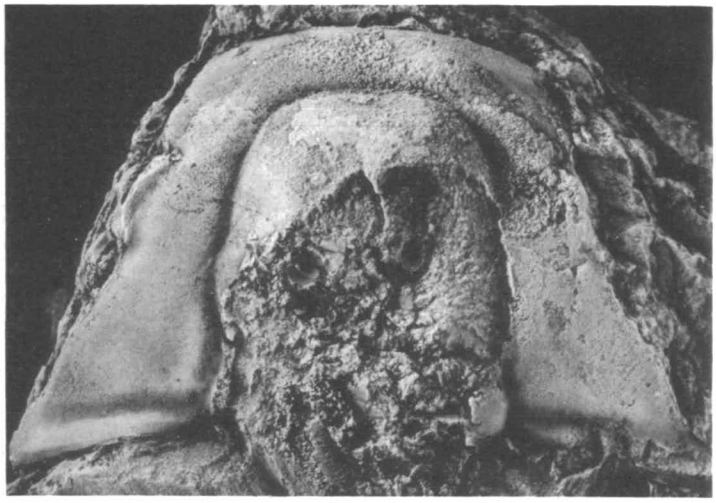
Figure 2 CPC 11817, exfoliated cranidium, lateral aspect; horizon K109; x8.

Figure 3 CPC 11818, latex cast from exfoliated pygidial mould showing degree of pleural segmentation; horizon K111; x8.

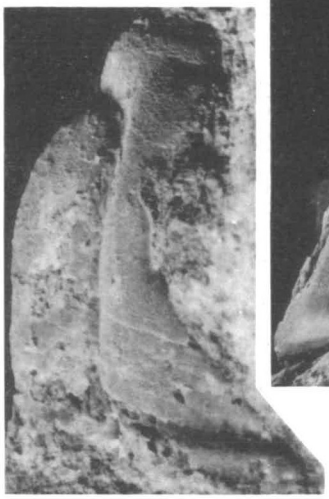
Figure 4 CPC 11819, exfoliated pygidial fragment with caecal network; horizon K111; x8.

Figure 5 CPC 11820, exfoliated pygidium showing extent of doublure; horizon K111; x6.

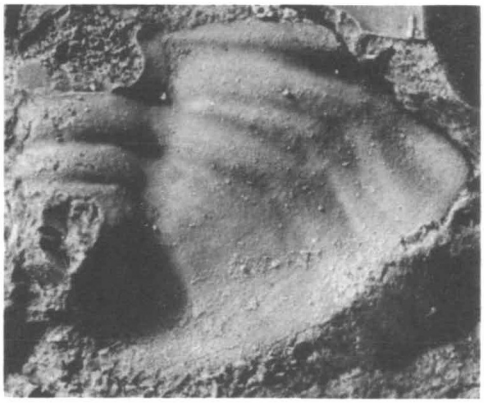
Figure 6 CPC 11821, latex cast from exfoliated cranidial mould showing traces of glabellar furrowing; horizon K111; x5.



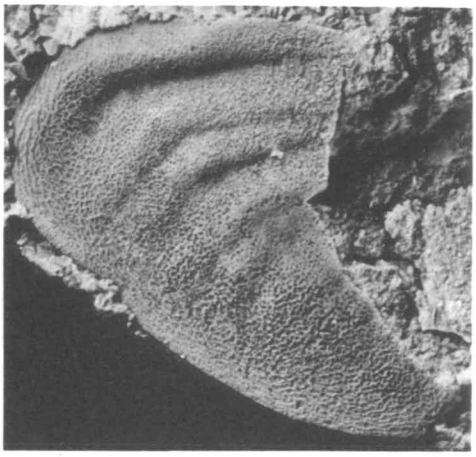
1



2



3



4

5

6

PLATE 28

Figures 1-9 *Quadraticephalus* cf. *teres* Resser & Endo, 1937 .... page 149

Figure 1 CPC 11827a, exfoliated cranidial fragment showing sagittal extent of preglabellar area and traces of glabellar musculature and sagittal keel which runs length of glabella; Mount Ninmaroo section; horizon K169; x6.

Figure 2 CPC 11827b, as above, latex cast; x6.

Figure 3 CPC 11828, exfoliated cranidial fragment; Mount Datson section, horizon K178; x6.

Figure 4 CPC 11829, near complete testaceous pygidium showing general shape and extent of borders and furrowing; Mount Datson section, horizon K178; x4.

Figure 5 CPC 11830, exfoliated pygidial fragment; Mount Ninmaroo section, horizon K168; x4.

Figure 6 CPC 11831, exfoliated pygidial fragment showing segmentation of pleural zone; Mount Ninmaroo section, horizon K168; x6.

Figure 7 CPC 11832, exfoliated pygidial fragment; Mount Ninmaroo section, horizon K168; x6.

Figure 8 CPC 11833, latex cast from partly exfoliated librigena with short spine, showing extent of borders; Mount Ninmaroo section, horizon K168; x3.

Figure 9 CPC 11834, testaceous librigena, somewhat flattened; Mount Ninmaroo section, horizon K168; x2.

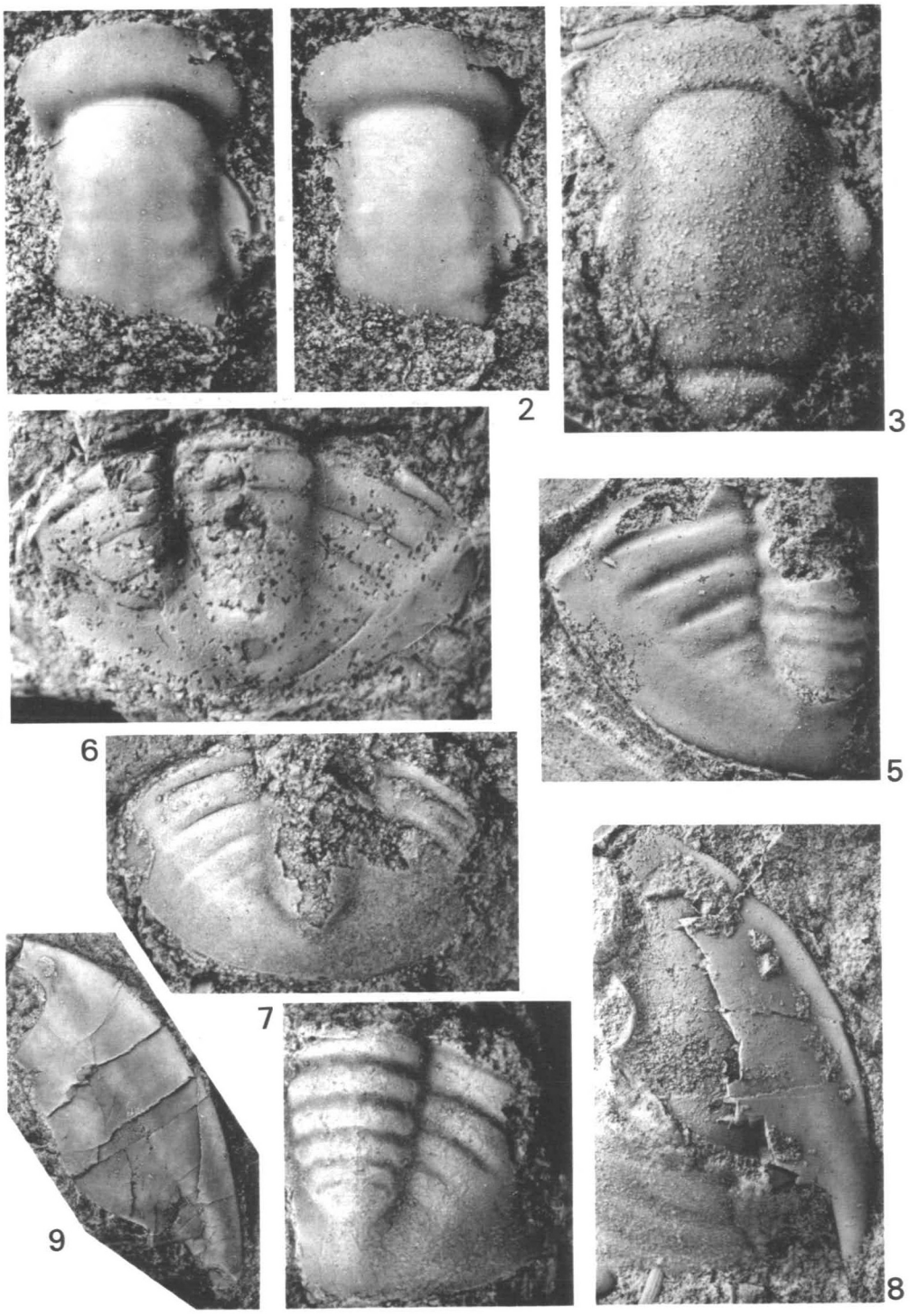

1
2
3
4
5
6
7
8
9

PLATE 29

Figures 1-4 *Ptychaspis* (*Asioptychaspis*) *delta* sp. nov. .... page 147
All specimens from the Black Mountain section

Figure 1 CPC 11824, exfoliated cranidial fragment showing glabellar furrowing and nuchal node; horizon K138; x16.

Figure 2 CPC 11825a, **holotype,** testaceous pygidium showing general shape, segmentation and prosopon; horizon K138; x16.

Figure 3 CPC 11825b, as above, latex cast; x16.

Figure 4 CPC 11826, partly exfoliated pygidial fragment; horizon K138; x 16.

Figures 5-10 *Pagodia* (*Datsonia*) *subterior* sp. nov. .... page 178

Figure 5 CPC 11885, **holotype,** incomplete largely exfoliated cranidium with thick shell, coarse granulosity, wire-like cranidial border, and rectangular glabella; Dribbling Bore section, horizon B777; x8.

Figure 6 CPC 11886, latex cast from cranidial fragment oriented to show extent of anterior cranidial border and relationship to glabella; Dribbling Bore section, horizon B777; x12.

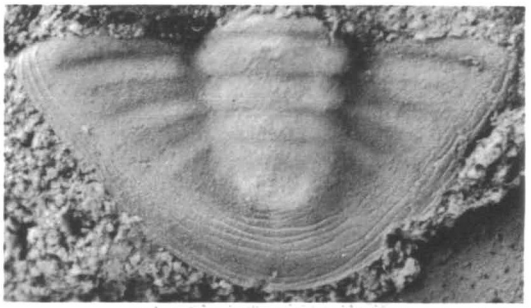
Figure 7 CPC 11887, exfoliated incomplete pygidium with coarse granulosity; Dribbling Bore section, horizon B777; x12.

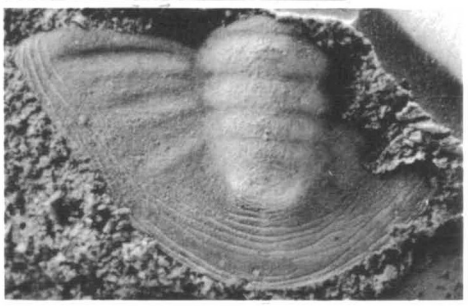
Figure 8 CPC 11890, librigenal fragment with advanced genal spine; Dribbling Bore section, horizon K191; x3.

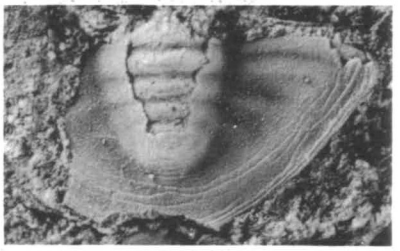
Figure 9 CPC 11888, testaceous pygidium showing overall shape and degree of segmentation; Dribbling Bore section, horizon K186; x10.

Figure 10 CPC 11889, latex cast from mould of meraspid or early holaspid pygidium showing granules developed as spines; Dribbling Bore, horizon B777; x14.

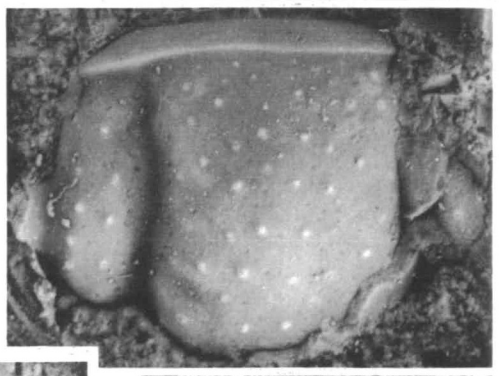

1


2


3


4


5


6


7


8


9

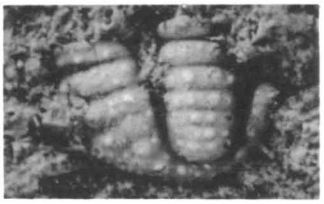

10

PLATE 30

Figures 1-8 *Euloma* (*Plecteuloma*) *strix* sp. nov. .... page 96
All specimens from the Black Mountain section

Figure 1 CPC 11835, **holotype,** testaceous cranidium with fine high-density granulation, showing glabellar shape and segmentation, position of palpebral lobes, ocular ridges, and extent of preglabellar area; horizon K103; x8.

Figure 2 CPC 11835, **holotype,** as above, lateral aspect; x8.

Figure 3 CPC 11836, a further testaceous cranidium with more deeply incised glabellar furrows; horizon K106; x8.

Figure 4 CPC 11837, testaceous cranidium showing some trace of caecal network of preglabellar field; horizon K106; x8.

Figure 5 CPC 11838, exfoliated pygidium with typical eulominid shape and segmentation; horizon K105; x8.

Figure 6 CPC 11839, well preserved testaceous librigena showing faint traces of caecal network concealed by granules; horizon K106; x8.

Figure 7 CPC 11840, testaceous librigenal fragment with preserved eye socle; horizon K106; x8.

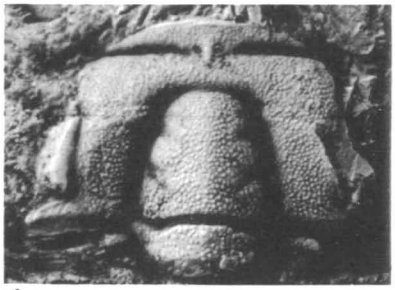
Figure 8 CPC 11841, exfoliated pygidial fragment associated with *Pseudagnostus elix* sp. nov. (CPC 11690); horizon K103; x8.

Figures 9-11 *Duplora clara* Shergold, 1972 .... page 98
All specimens from the Black Mountain section

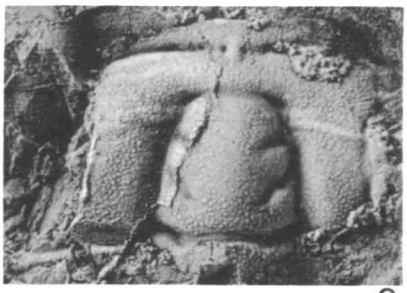
Figure 9 CPC 11844, two cranidial fragments in association with *Pseudagnostus clarki prolatus* subsp. nov., and *Pagodia* (*Lotosoides*) *calcarata* sp. nov.; horizon K111; x8.

Figure 10 CPC 11843, exfoliated cranidial fragment lacking anterior cranidial border; horizon K111; x8.

Figure 11 CPC 11842, exfoliated cranidial fragment showing traces of caecal network of preglabellar field; horizon K111; x8.


1

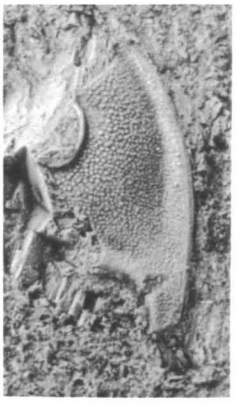

2

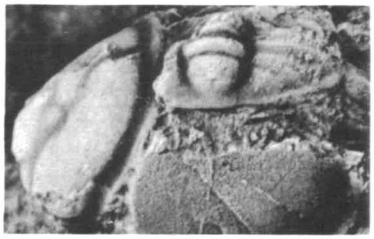

3

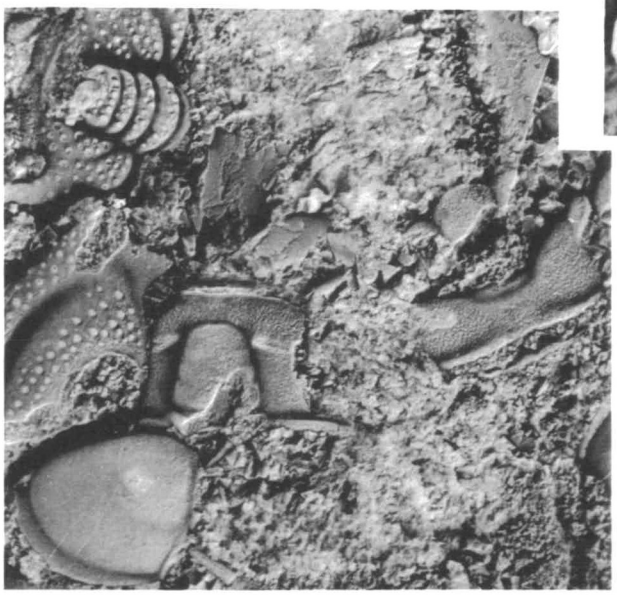

4

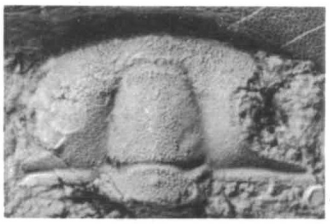

5


6


7


8


9


10

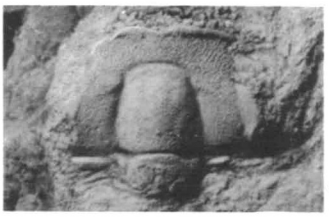

11

PLATE 31

Figures 1-4 *Sigmakainella primaeva* sp. nov. .... page 160
All specimens from the Black Mountain section

Figure 1 CPC 11849, **holotype,** testaceous cranidial fragment with well preserved caecal network on preglabellar field; horizon K106; x4.5.

Figure 2 CPC 11850, testaceous cranidial fragment as above; horizon K106; x6.

Figure 3 CPC 11851, latex cast of fragmentary pygidium showing spine bases and extent of doublure; horizon K106; x8.

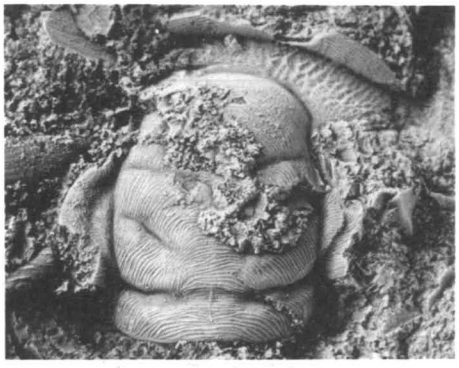
Figure 4 CPC 11852, exfoliated librigena showing caecal network and slender advanced genal spine; horizon K103; x8.

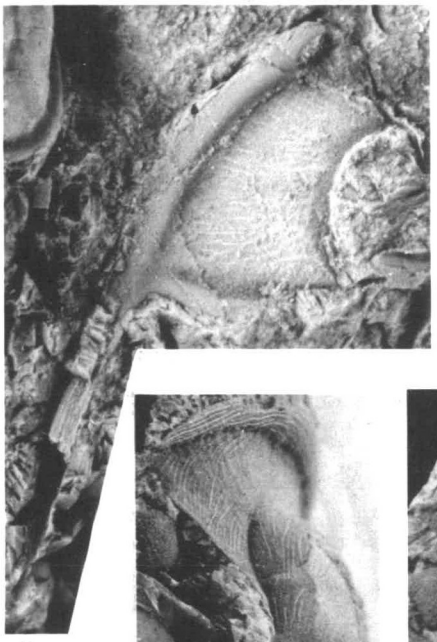
Figures 5-6 *?Richardsonella* sp. .... page 163

Figure 5 CPC 11854, cranidium retaining vestige of shell and showing extent of preglabellar area and courses of preocular facial sutures; Black Mountain section, horizon K106; x9.

Figure 6 CPC 11854, as above, lateral aspect; x9.


1


2


4


3


5

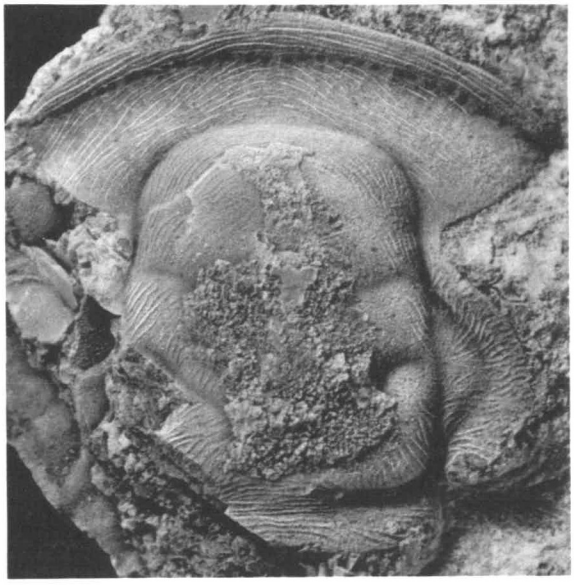

6

PLATE 32

Figures 1-4 *Sigmakainella translira* Shergold, 1972 .... page 159
All specimens from the Black Mountain section

Figure 1 CPC 11845, well preserved cranidial mould showing full extent of preglabellar area and its prosopon; horizon K112; x8.

Figure 2 CPC 11846, silicified librigena with advanced genal spine; horizon K113; x8.

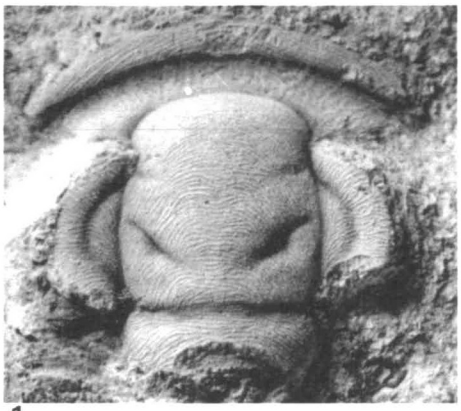
Figure 3 CPC 11847, pygidial fragment with transverse post-axial lirations; horizon B507a'' x6.

Figure 4 CPC 11848, completely exfoliated pygidial fragment; horizon B507a'; x8.

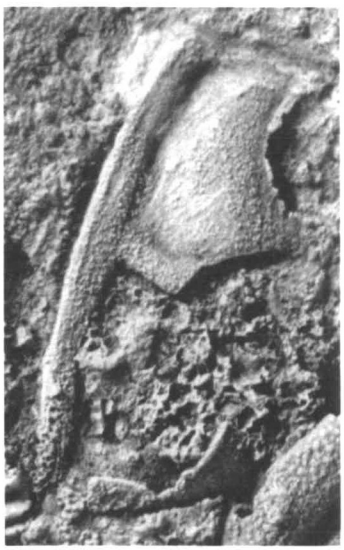
Figures 5-6 *?Sigmakainella trispinosa* sp. nov. .... page 162

Figure 5 CPC 11853b, latex cast from external mould of **holotype** showing presence of three spine bases; horizon K121, Black Mountain section; x8.

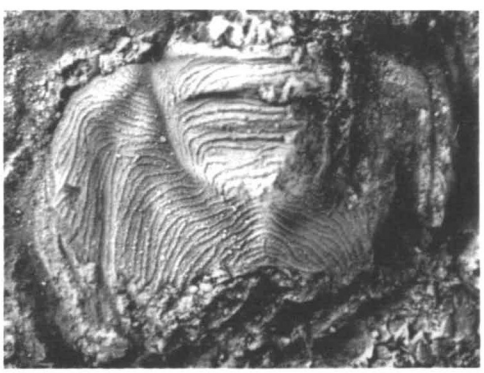
Figure 6 CPC 11853a, **holotype,** testaceous pygidium with three pairs of swept-back pleura similar to those of *Hungaia;* horizon K121, as above; x8.



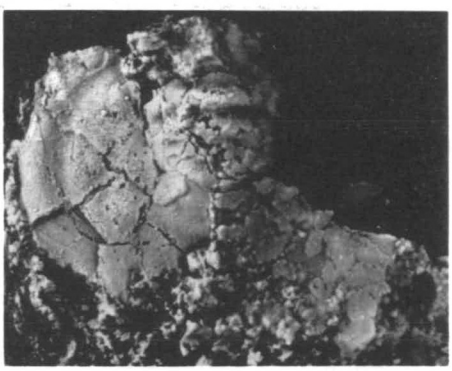
1



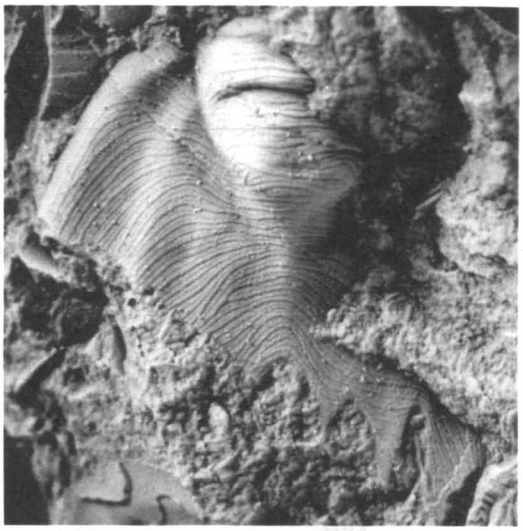
2



3



4



5

6

PLATE 33

Figure 1 *Sigmakainella longilira* Shergold, 1972 .... page 160

Figure 1 CPC 11855, exfoliated pygidial fragment lacking axis; Black Mountain section; horizon K123; x8.

Figures 2-7 *Haniwa mucronata* sp. nov.
All specimens from the Black Mountain section

Figure 2 CPC 11856, exfoliated early holaspid cranidium with well developed caecal system and glabellar pits; horizon K138; x16.

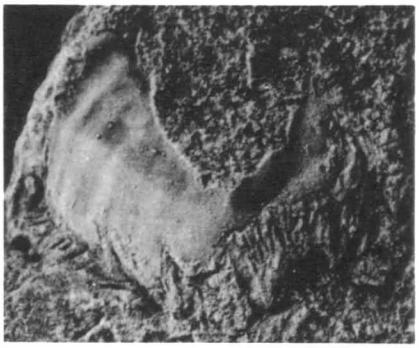
Figure 3 CPC 11857, late holaspid exfoliated cranidium having effaced glabellar pits; horizon B510b; x16.

Figure 4 CPC 11858, largely effaced late holaspid cranidium as above; horizon K138; x12.

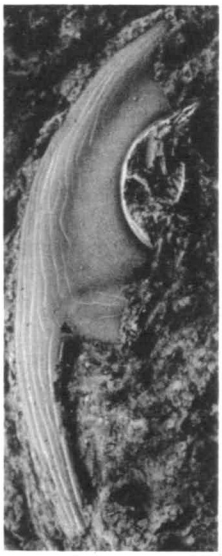
Figure 5 CPC 11859, early holaspid cranidium with well developed glabellar pits, nuchal node, and caecal system which includes a narrow vein running around rim of palpebral lobe; horizon B510b; x16.

Figure 6 CPC 11860, testaceous librigena with well preserved lirate prosopon, and eye socle surmounted by vestige of holochroal visual surface; horizon B510b; x7.

Figure 7 CPC 11861, librigena as above; horizon K138; x8.

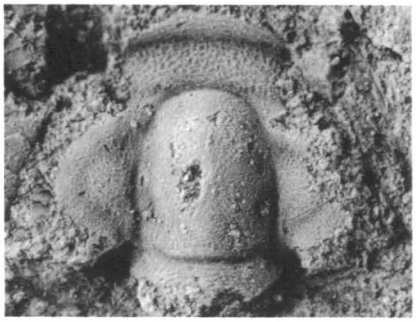


1

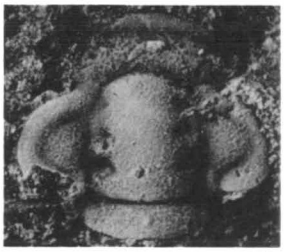


7

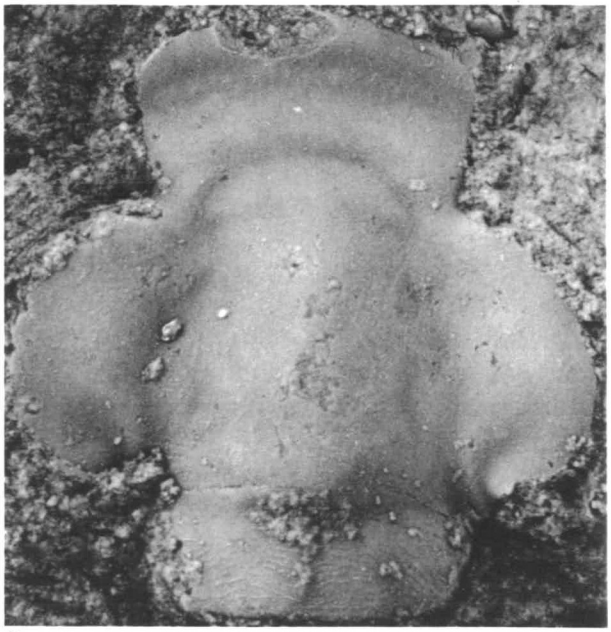
6



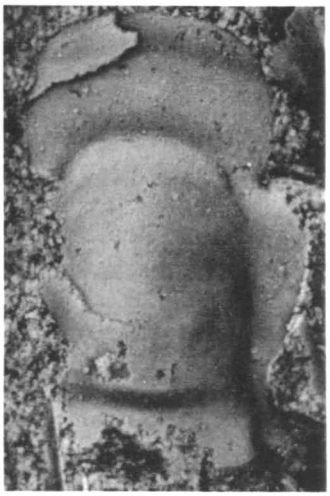
2



5



3



4

PLATE 34

Figures 1-7 *Haniwa mucronata* sp. nov. .... page 164
All specimens from the Black Mountain section

Figure 1 CPC 11862, **holotype,** pygidium mainly retaining shell showing remopleuridacean style of articulation of axial segments and orientation of pleurae; horizon K138; x8.

Figure 2 CPC 11863, testaceous pygidium as above; horizon K138; x16.

Figure 3 CPC 11864, detail of pygidium showing points of origin, orientation, and shape of marginal spines; horizon K138; x12.

Figure 4 CPC 11865, detail of pygidium showing axial articulation; horizon K139; x16.

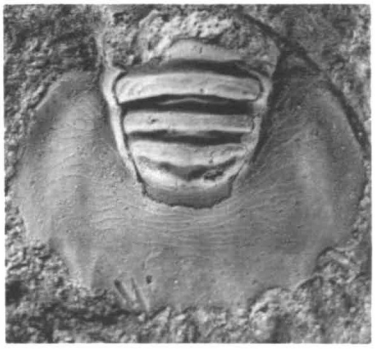
Figure 5 CPC 11866, early holaspid testaceous pygidium; horizon K138; x16.

Figure 6 CPC 11867a, exfoliated hypostoma tentatively assigned to this species; horizon K138; x16.

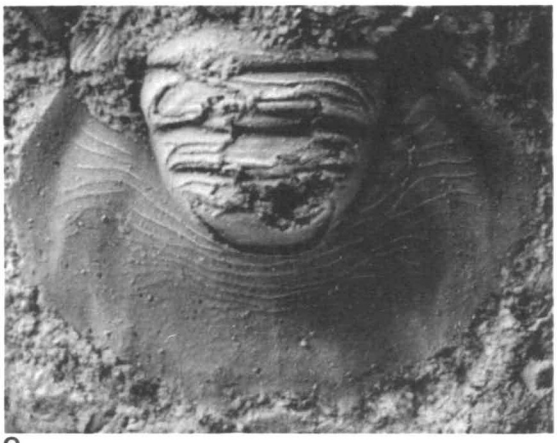
Figure 7 CPC 11867b, latex cast from above specimen having lirate margins; x16.

Figure 8 Idahoiid gen. et sp. undet. .... page 154

Figure 8 CPC 12857, fragmentary, partly exfoliated cranidium having some affinity with *Atratebia;* horizon K105; x8.

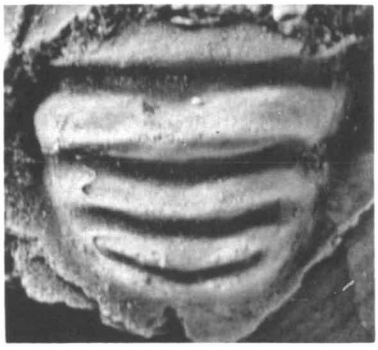


1

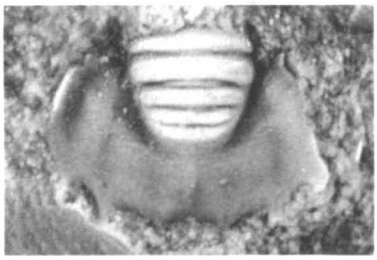


2

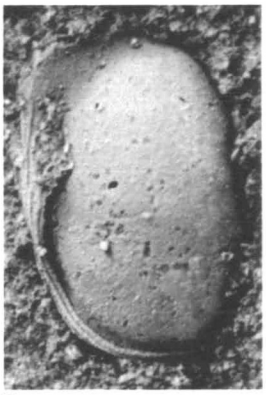
3



4



5



6

7

8

PLATE 35

Figures 1-6 *Atratebia nexosa* sp. nov. .... page 155
All specimens from the Black Mountain section

Figure 1 CPC 11868a, **holotype,** testaceous cranidium showing full extent of preglabellar area, relationship to glabella, size and position of palpebral lobes, and short posterolateral limbs; horizon B507b; x9.

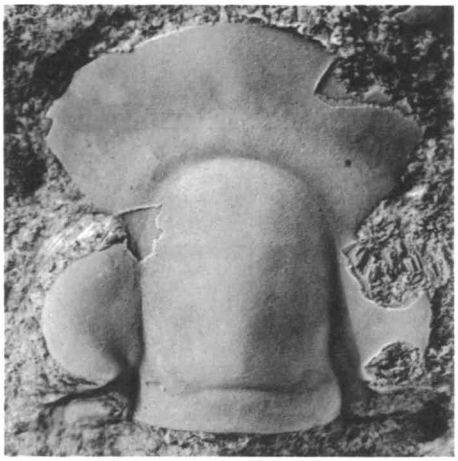
Figure 2 CPC 11868b, latex cast from partly exfoliated cranidium, showing traces of caecal system of preglabellar field and faint glabellar furrows; horizon B507b; x16.

Figure 3 CPC 11872, partly exfoliated librigena assigned to this species; horizon K109; x8.

Figure 4 CPC 11869, latex cast from external mould of pygidium showing axial segmentation; horizon K109; x8.

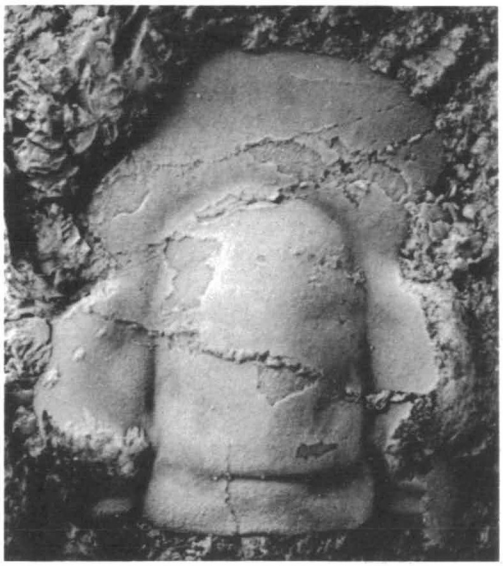
Figure 5 CPC 11871, incomplete testaceous pygidium showing extent of pleural segmentation; horizon B507b; x8.

Figure 6 CPC 11870, lateral view of exfoliated pygidium; horizon K109; x8.



1

3



2

4

6

5

PLATE 36

Figures 1-2 *Pagodia* (*Oreadella*) cf. *buda* (Resser & Endo, 1933) .... page 172
Both specimens from the Black Mountain section

Figure 1 CPC 11874, exfoliated cranidium having constricted glabella, narrow palpebral areas, and small palpebral lobes; horizon K110; x8.

Figure 2 CPC 11875, exfoliated pygidium lacking depressed border, having entire margins; horizon K110; x8.

Figure 3 *Pagodia* (*Pagodia*) sp. .... page 171

Figure 3 CPC 11873, testaceous pygidium, coarsely granulose, with well demarcated border, associated with cephalon of *Koldinioidia* cf. *cylindrica* (Shergold); Black Mountain section, horizon K106; x8.

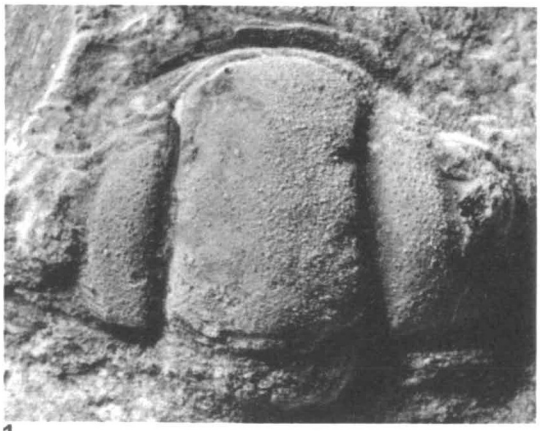
Figures 4-7 *Pagodia* (*Lotosoides*) *turbinata* sp. nov. .... page 176
All specimens from the Black Mountain section

Figure 4 CPC 11876, testaceous cranidium with forward-tapering glabella, defined ocular ridges, transversely wide palpebral areas, and coarsely granulose prosopon; horizon K111; x8.

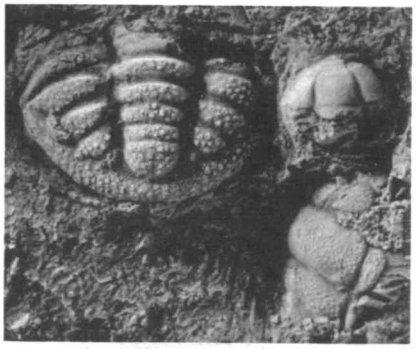
Figure 5 CPC 11876, lateral profile; x8.

Figure 6 CPC 11877, testaceous pygidium lacking depressed border, showing incipient marginal spines and possessing coarsely granulose prosopon; horizon K115; x9.

Figure 7 CPC 11878, **holotype,** testaceous cranidium diagnosed as Figure 4; horizon K116; **x8.**

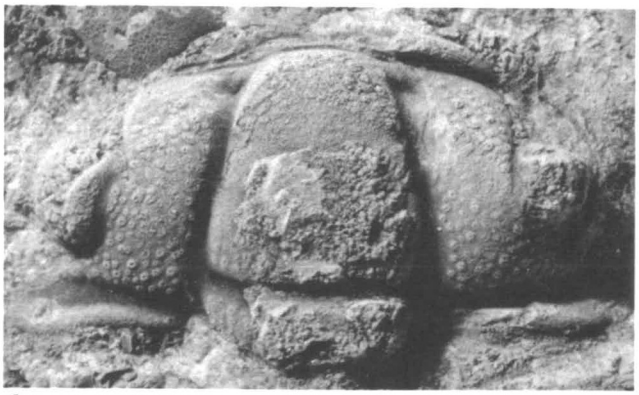


1

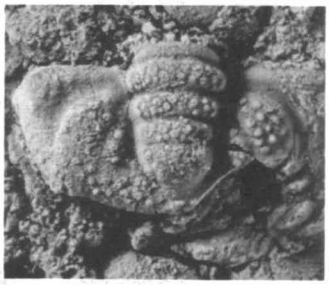


3

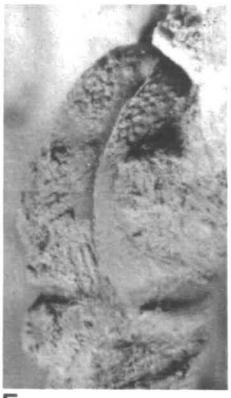
2



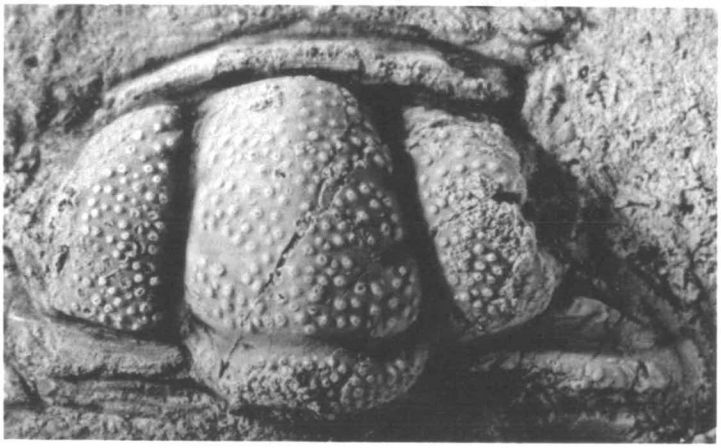
4



6



5



7

PLATE 37

Figures 1-6 *Pagodia* (*Lotosoides*) *calcarata* sp. nov. .... page 174
All specimens from the Black Mountain section

Figure 1 CPC 11879, **holotype,** exfoliated cranidium with forward-tapering glabella, well defined ocular ridges, showing finely granulose prosopon; horizon K111; x8.

Figure 2 CPC 11879, **holotype,** lateral view; x8.

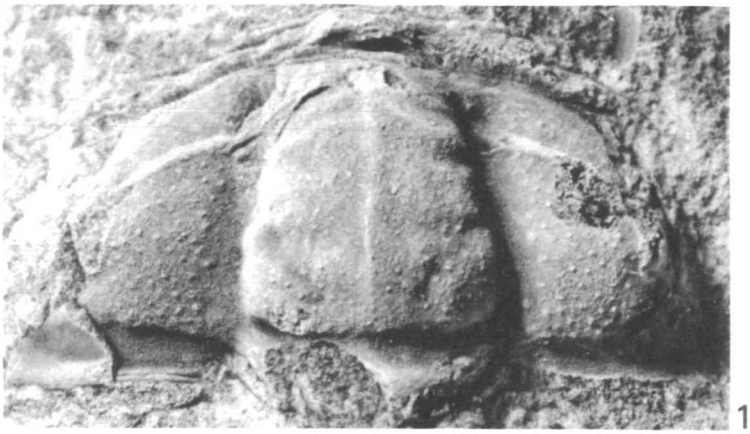
Figure 3 CPC 11880, exfoliated silicified cranidium; horizon B507c; x8.

Figure 4 CPC 11881, testaceous pygidium without depressed border but possessing long marginal spines; horizon K111; x8. Note courses of anteriormost pleural furrows.

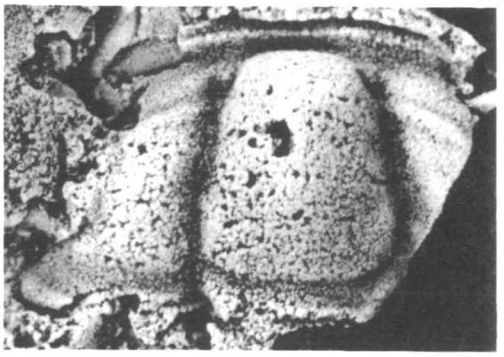
Figure 5 CPC 11882, testaceous pygidium (A), associated with CPC 11883, a testaceous librigena with advanced genal spine (B), a cranidium of *Duplora clara* Shergold, and *Pseudagnostus clarki prolatus* subsp. nov.; horizon K111; x8.

Figure 6 CPC 11884, latex cast from parietal surface of pygidial fragment having a narrow posterior border; horizon K111; x6.

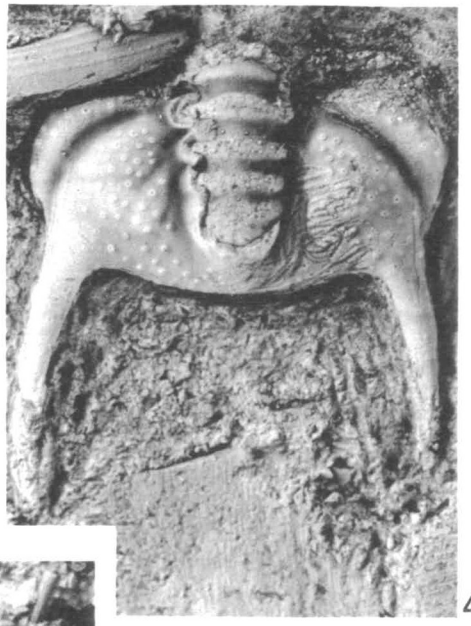
2



1

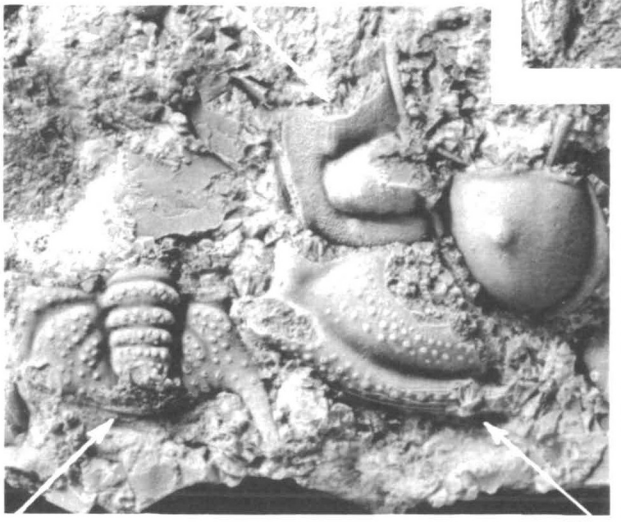


3



4

5c



5a

5b

6

PLATE 38

Figures 1-11 *Mansuyia* cf. *orientalis* Sun, 1924 .... page 180

Figure 1 CPC 11891, imperfectly preserved meraspid cranidium with large palpebral lobes, sited well forward, and near-transverse ocular ridges; horizon K136; x12.

Figure 2 CPC 11892, early holaspid testaceous cranidium with narrow (sag.) preglabellar area, and narrow cylindrical glabella; horizon K136; x12.

Figure 3 CPC 11893, latex cast from external mould of early holaspid cranidium showing narrow (sag.) preglabellar area, having bertillon pattern prosopon; horizon K136; x9.

Figure 4 CPC 11898, latex cast from mould of meraspid pygidium with long lateral spines drawn from lateral pygidial margins and shallow bowl; horizon K136; x12.

Figure 5 CPC 11897, meraspid pygidium with attached thoracic segments; horizon K136; x12.

Figure 6 CPC 11894, holaspid testaceous cranidium, retaining cylindrical glabellar shape; horizon K133; x10.

Figure 7 CPC 11895, latex cast from late holaspid cranidium showing considerably widened (sag.) preglabellar area, and a degree of glabellar taper; horizon K133; x8.

Figure 8 CPC 11901, exfoliated pygidial fragment showing traces of caecal network at distal extremities of pleura; horizon K136; x12.

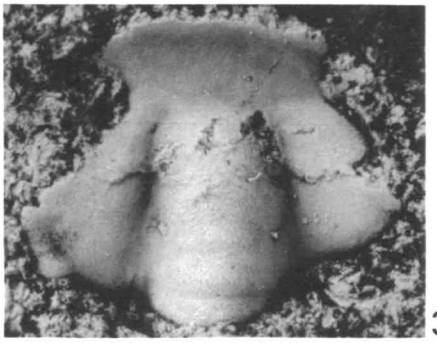
Figure 9 CPC 11900, late holaspid testaceous pygidium with well developed but shallow bowl; horizon K130; x10.

Figure 10 CPC 11899b, latex cast from mould of meraspid pygidium; horizon K133; x8.

Figure 11 CPC 11899a, exfoliated limestone mould of meraspid pygidium; horizon K133; x8.

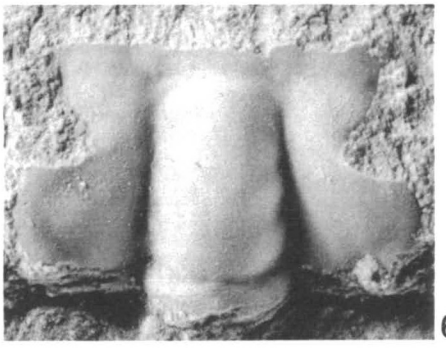

1

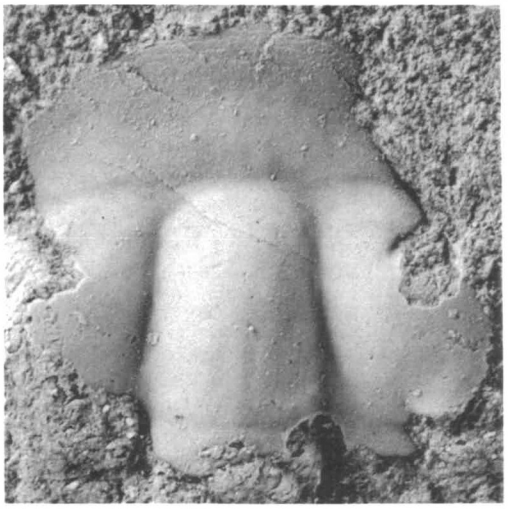

2


3

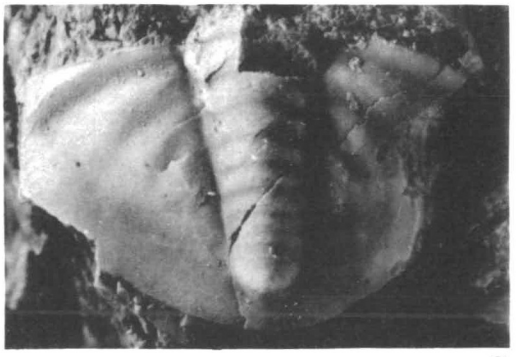

4


5


6


7


8


9


10


11

PLATE 39

Figures 1-2 *Mansuyia* cf. *orientalis* Sun, 1924 .... page 180
Both specimens from the Black Mountain section

Figure 1 CPC 11902, latex cast from external mould of late holaspid pygidium (cf. Sun, 1924, pl. 3, figs 7i-j); horizon K136; x8.

Figure 2 CPC 11896, latex cast from external mould of late holaspid cranidium; horizon K136; x8.

Figures 3-7 *Mansuyia* cf. *tani* Sun, 1935 .... page 182
All specimens from the Black Mountain section

Figure 3 CPC 11905, late holaspid testaceous pygidium with short, hooked, lateral spines, deep bowl, and border; horizon K139; x9.

Figure 4 CPC 11903, late holaspid testaceous cranidium with tapered glabella and wide (sag.) preglabellar area; horizon K139; x8.

Figure 5 CPC 11906b, latex cast from mould of early holaspid pygidium having shallow bowl; horizon B510; x14.

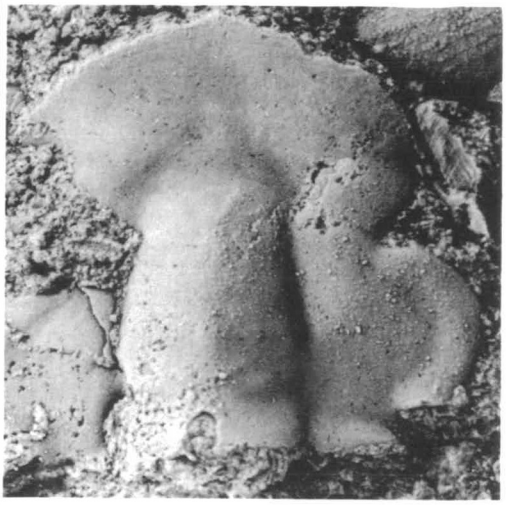
Figure 6 CPC 11906a, counterpart of above, early holaspid pygidium with long spines and relatively shallow bowl; horizon B510; x14.

Figure 7 CPC 11904, meraspid cranidium with cylindrical glabella, anteriorly sited palpebral lobes, transverse ocular ridges, and short (sag.) preglabellar area; horizon B510b; x16.

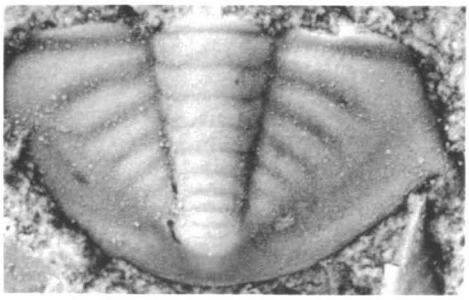
1

2

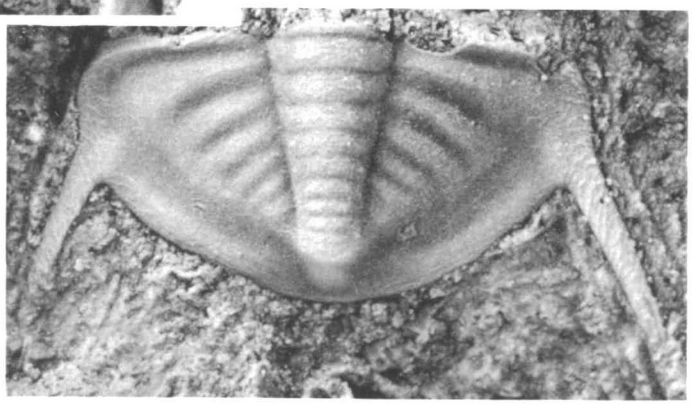
3



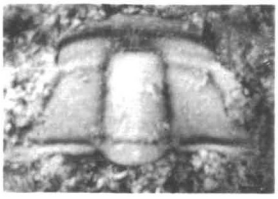
4



5



6



7

PLATE 40

Figures 1-6 *Hapsidocare chydaeum* sp. nov. .... page 185
All specimens from the Black Mountain section

Figure 1 CPC 11907, **holotype,** late holaspid testaceous cranidium showing all characteristics noted in diagnosis; horizon K105; x6.

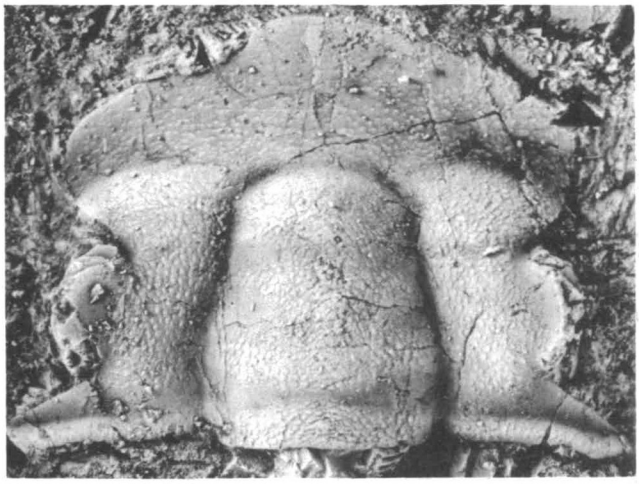
Figure 2 CPC 11910, testaceous librigena with short (tr.) deeply incised posterior marginal furrow and chevronate lirae along genal spine; horizon K103; x8.

Figure 3 CPC 11907, lateral view of **holotype;** x6.

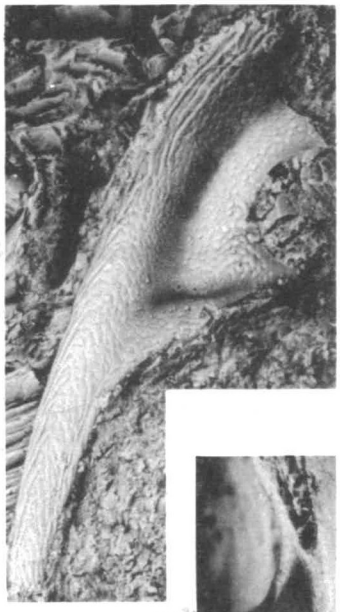
Figure 4 CPC 11909, partly exfoliated late holaspid cranidium showing very long (tr.) posterolateral limbs; horizon K106; x4.5.

Figure 5 CPC 11908, holaspid testaceous cranidium; horizon K103; x8.

Figure 6 CPC 11908, as above, lateral view; x8.

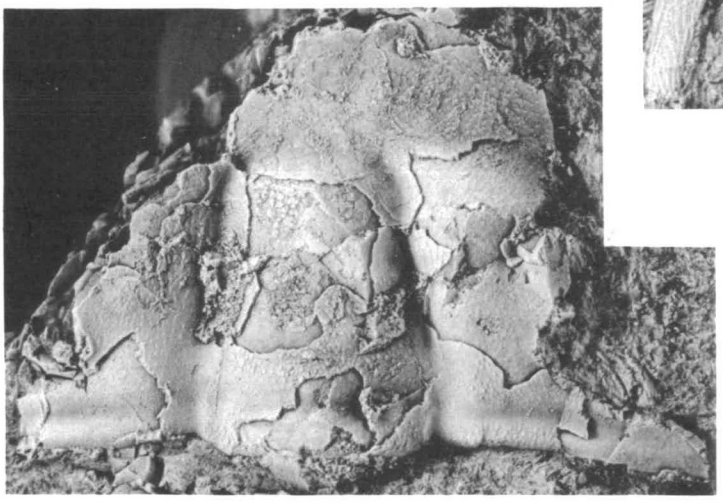


1



2

3



4

5

6

PLATE 41

Figures 1-3 *Hapsidocare chydaeum* sp. nov. .... page 185
All specimens from the Black Mountain section

Figure 1 CPC 11911, virtually exfoliated holaspid pygidium lacking bowl and possessing spines derived from pygidial flanks; horizon K103; x6.

Figure 2 CPC 11912, latex cast from parietal surface of pygidium with traces of caecal network; horizon K106; x8.

Figure 3 CPC 11913, exfoliated late holaspid pygidium showing parietal morphology; horizon K106; x3.

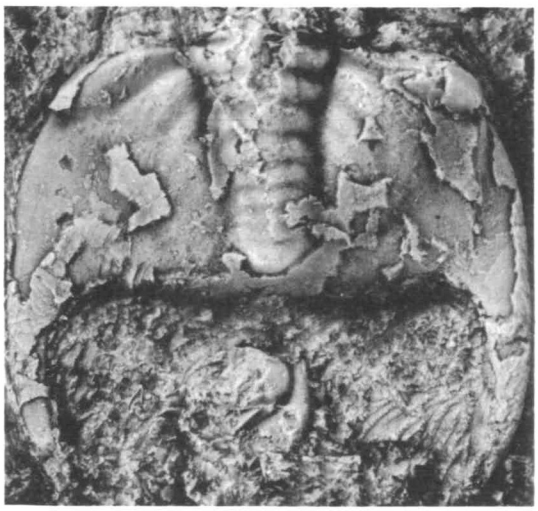
Figures 4-7 *Hapsidocare grossum* sp. nov. .... page 187
All specimens from the Black Mountain section

Figure 4 CPC 11916, early holaspid cranidium with strongly sloping ocular ridges and finely granulose prosopon; horizon K109; x4.5.

Figure 5 CPC 11917, fragments of two librigenae with characteristic marginal prosopon; horizon K108; x8.

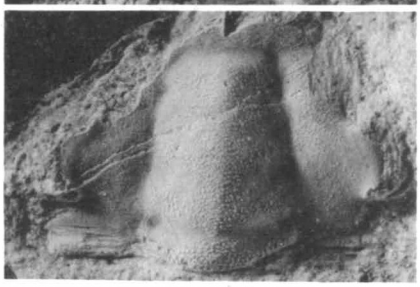
Figure 6 CPC 11920b, latex cast from external mould of holaspid pygidium showing stout spine; horizon K109; x8.

Figure 7 CPC 11915, latex cast from external mould of holaspid cranidium; horizon K109; x8.

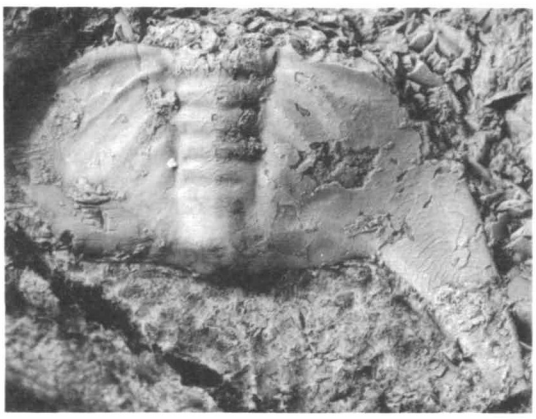


1

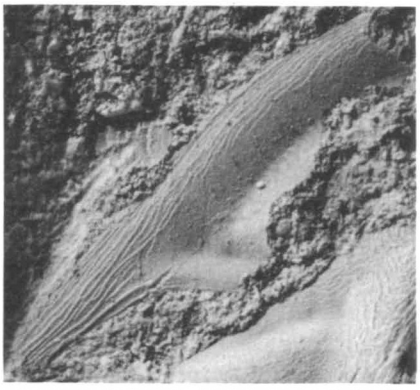
2



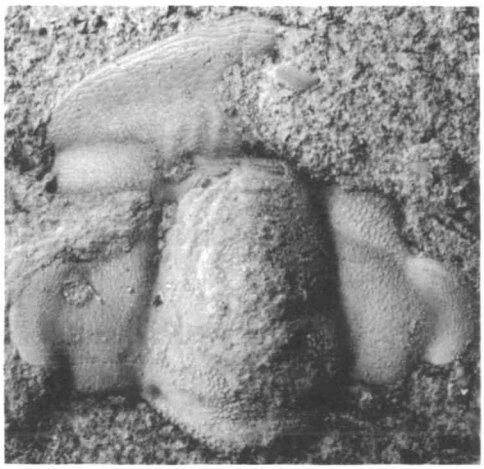
4



3



5



7

6

PLATE 42

Figures 1-5 *Hapsidocare grossum* sp. nov. .... page 187
All specimens from the Black Mountain section

Figure 1 CPC 11914, **holotype,** testaceous cranidium showing characteristic granulose prosopon; horizon K117; x4.5.

Figure 2 CPC 11918, late holaspid pygidium, posteriorly distorted, but showing development of shallow bowl, and possessing massive lateral spines; horizon K109; x6.

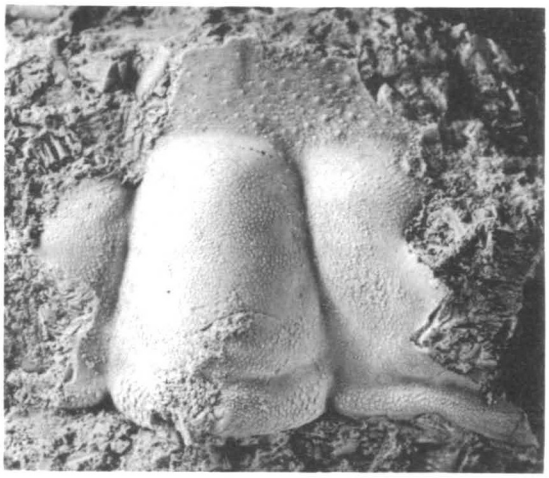
Figure 3 CPC 11921, latex cast from parietal surface of a late holaspid pygidium showing caecal network; horizon K116; x4.

Figure 4 CPC 11920a, exfoliated pygidial mould, counterpart of CPC 11920b; horizon K109; x6.

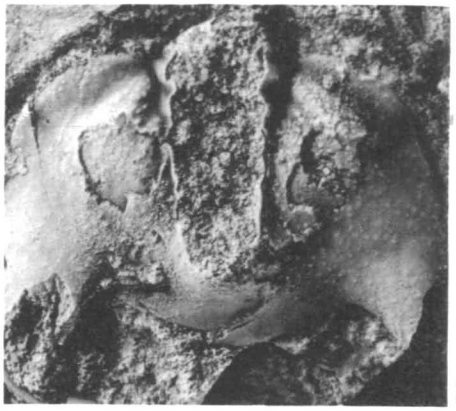
Figure 5 CPC 11919, large late holaspid pygidium with stout lateral spines and narrow posterior border; horizon K116; x4.5.

Figure 6 *Ceronocare pandum* sp. nov.

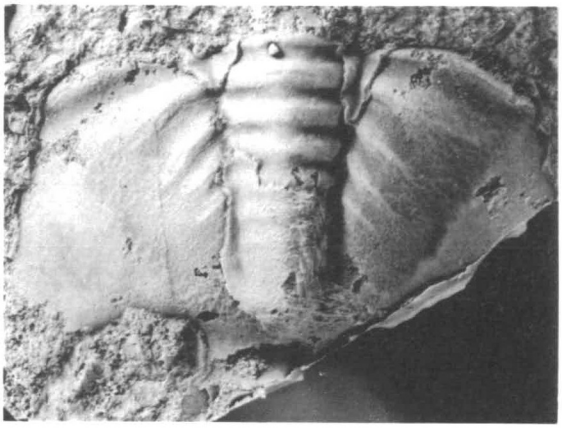
Figure 6 CPC 11935, large exfoliated late holaspid cranidial fragment showing duplicated ocular ridges and caecal network of preglabellar field; Black Mountain section, horizon K117; x4.5.



1

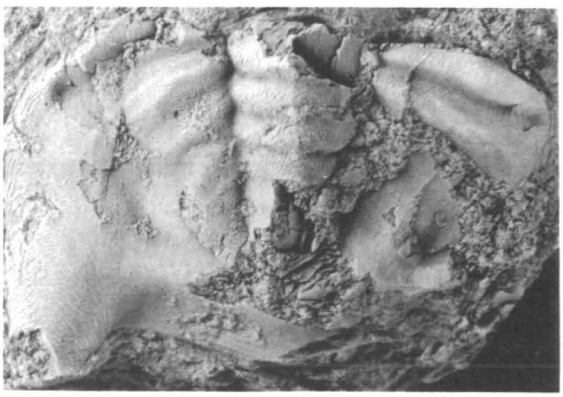


2



3

4



5

6

PLATE 43

Figures 1-7 *Ceronocare pandum* sp. nov. .... page 192
All specimens from the Black Mountain section

Figure 1 CPC 11929, **holotype,** late holaspid testaceous cranidial fragment, with extent of preglabellar area fully preserved; horizon K111; x6.

Figure 2 CPC 11930, latex cast from external mould of large late holaspid cranidium; horizon K111; x6.

Figure 3 CPC 11931a, meraspid cranidium with short (sag.) preglabellar area and pitted glabellar furrows; horizon K112; x8.

Figure 4 CPC 11932, meraspid cranidium as above; horizon K112; x8.

Figure 5 CPC 11931b, latex cast from counterpart of 11931a; x8.

Figure 6 CPC 11933, detail of preglabellar field having granuloplicate prosopon; horizon K111; x8.

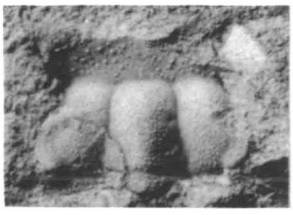
Figure 7 CPC 11934, early holaspid pygidium showing laterally deflected spines and quadrate anterolateral margins; horizon K116; x9.

Figure 8 *Ceronocare* sp. .... page 194

Figure 8 CPC 11936, latex cast from external mould of holaspid cranidium with narrow (tr.) preglabellar area; Black Mountain section, horizon K106; x4.5.

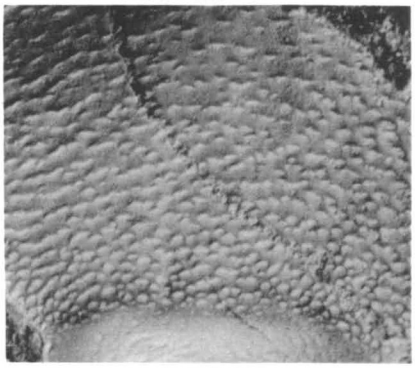

1

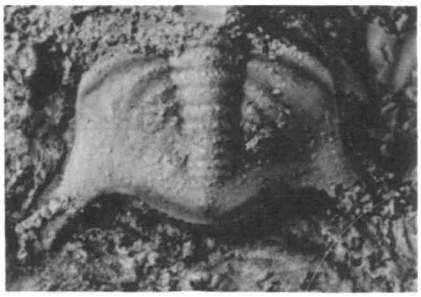

2


3


4


5


6


7

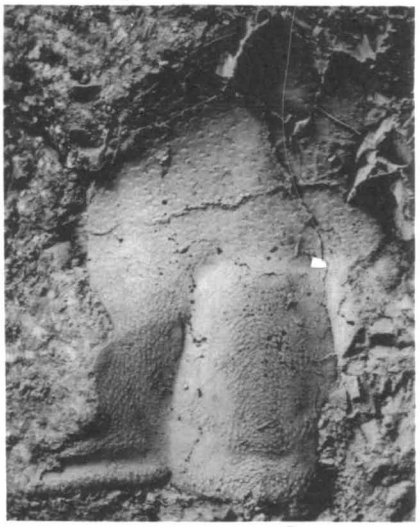

8

PLATE 44

Figures 1-6 *Palacorona torosa* sp. nov. .... page 189
All specimens from the Dribbling Bore section

Figure 1 CPC 11927, large partly exfoliated pygidium longer than 20 mm, with multi-annulated axis and showing mode of derivation of lateral spines; horizon K196; x3.5.

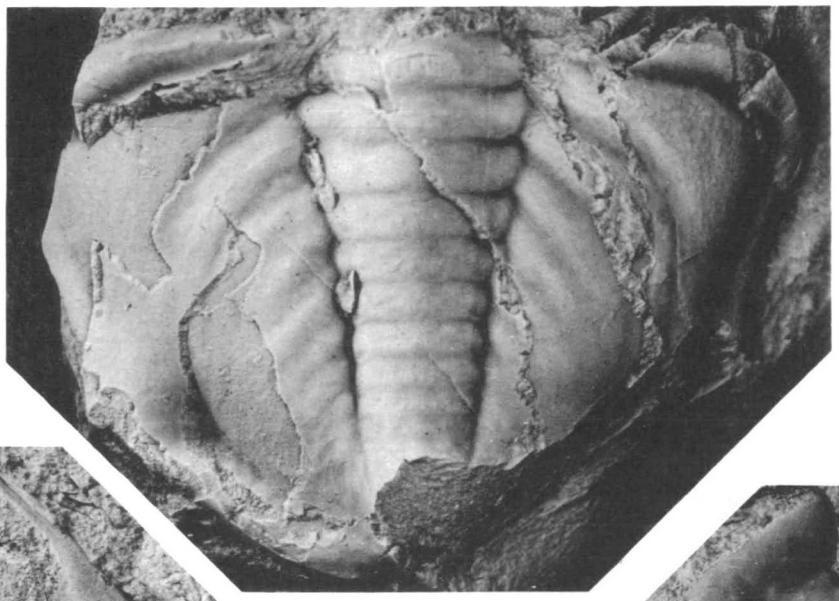
Figure 2 CPC 11925, latex cast from cranidial fragment showing duplicated ocular ridges; horizon K187; x3.

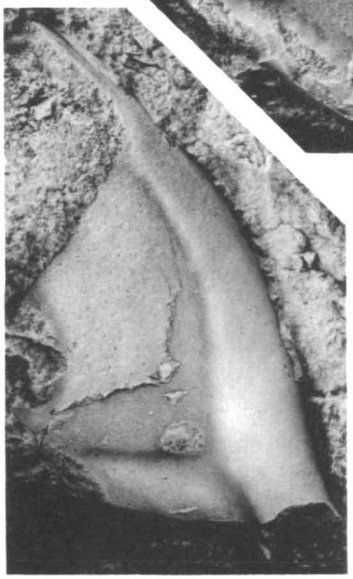
Figure 3 CPC 11922, **holotype,** latex cast of near-complete cranidium showing extent of preglabellar area, size and position of palpebral lobes, and glabellar characteristics; horizon B777; x3.

Figure 4 CPC 11926, exfoliated librigena with laterally deflected genal spine; horizon K186; x3.

Figure 5 CPC 11923, exfoliated cranidial fragment showing full extent of preglabellar area; horizon B777; x4.

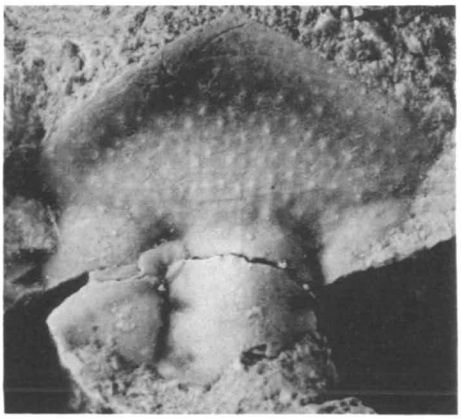
Figure 6 CPC 11924, latex cast from a partly exfoliated cranidial mould showing traces of caecal network of preglabellar field; horizon K186; x4.


1


4


3


2


5


6

PLATE 45

Figure 1 *Palacorona* sp. .... page 191

Figure 1 CPC 11928, exfoliated cranidial fragment possessing nuchal node; Black Mountain section; horizon K121; x8.

Figures 2-5 *Parakoldinioidia bigranulosa* sp. nov. .... page 195
All specimens from the Black Mountain section

Figure 2 CPC 11937, **holotype,** exfoliated cranidial fragment showing anterior cranidial prong, typical glabellar furrowing, sagittally cleft frontal lobe, and granules of two sizes; horizon B507a″; x16.

Figure 3 CPC 11938, further exfoliated cranidial fragment with anterior prong; horizon K118; x8.

Figure 4 CPC 11940, partly exfoliated pygidium showing general shape and degree of segmentation; horizon B507a′; x14.

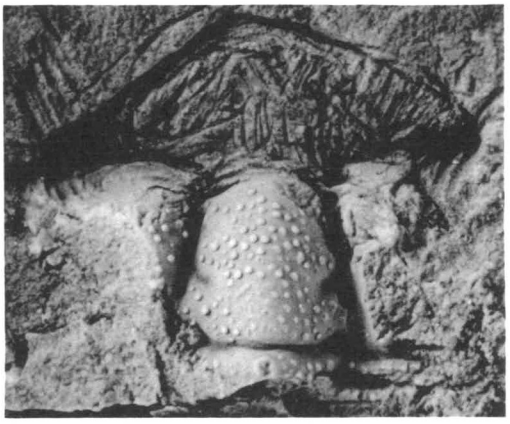
Figure 5 CPC 11939, weathered silicified pygidium; horizon B507a″; x20.

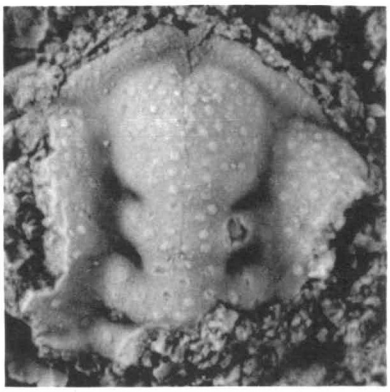
Figures 6-8 *Leiostegium* (*Leiostegium*) *floodi* sp. nov. .... page 168
Both specimens from the Black Mountain section

Figure 6 CPC 11942, virtually exfoliated cranidium about twice as large as the holotype; horizon K146; x4.

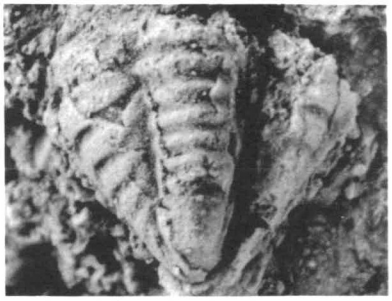
Figure 7 CPC 11941, **holotype,** exfoliated cranidium showing relationship of cranidial border to glabella, and traces of glabellar furrowing; horizon K146; x8.

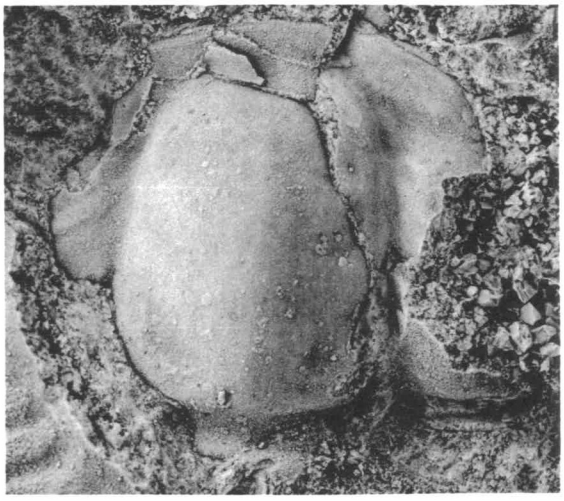
Figure 8 CPC 11941, as above, lateral aspect showing orientation of cranidial border; x8.

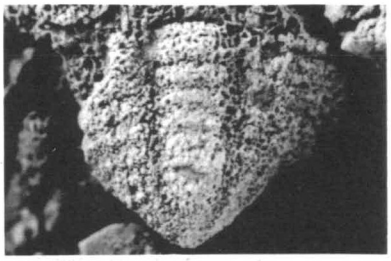

1

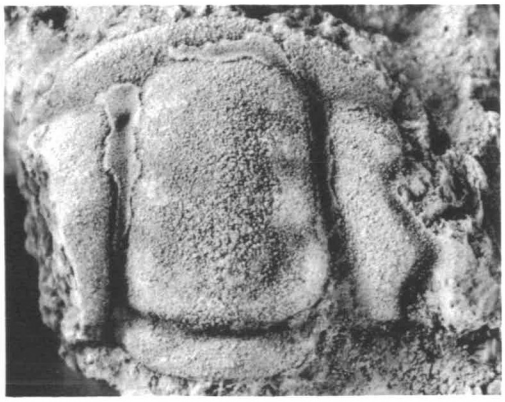

2


3


4


6


5


7


8

PLATE 46

Figure 1 Leiostegiacean genus incertae sedis 2 .... page 211

Figure 1 CPC 11946, poorly preserved cranidial fragment with ocular ridges, long blade-like posterolateral limbs, and strongly curved anterior cranidial outline; Dribbling Bore section, horizon K195; x4.

Figure 2 Leiostegiacean genus incertae sedis 3 .... page 211

Figure 2 CPC 11947, latex cast from cranidial fragment showing low-density coarse granulation; Dribbling Bore section, horizon K195; x7.

Figures 3-4 *Onychopyge assula* sp. nov. .... page 220

Figure 3 CPC 12888, exfoliated cranidial fragment with long strongly curved palpebral lobe and glabellar furrowing typical of genus; Dribbling Bore section, horizon K195; x8.

Figure 4 CPC 12889, **holotype,** exfoliated pygidial fragment; Dribbling Bore section, horizon K195; x8.

Figures 5-7 Leiostegiacean genus incertae sedis 1 .... page 211

Figure 5 CPC 11943, silicified pygidial fragment; Black Mountain section, horizon K147; x8.

Figure 6 CPC 11944, silicified pygidial fragment; Black Mountain section, horizon K147; x8.

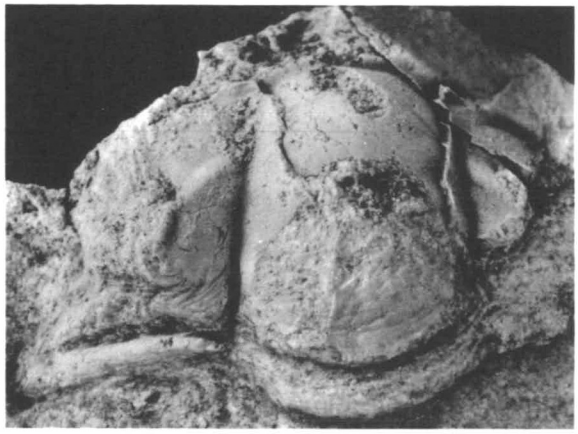
Figure 7 CPC 11945, further pygidial fragment showing extent of border and degree of pleural segmentation; Black Mountain section, horizon K149; x8.

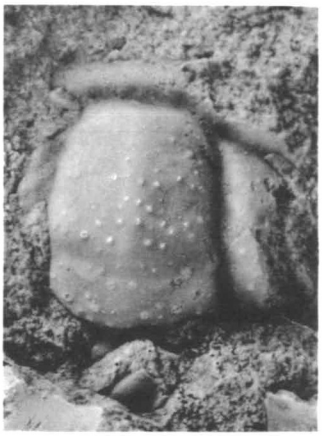
Figures 8-10 *?Protopeltura* sp. .... page 103

Figure 8 CPC 12000, lateral aspect of exfoliated cranidium, showing relationship of pre-glabellar field and border; Black Mountain section, horizon K121; x8.

Figure 9 CPC 12000, dorsal aspect; x8.

Figure 10 CPC 12855, exfoliated librigena with small genal spine showing caecal network; Black Mountain section, horizon K121; x8.

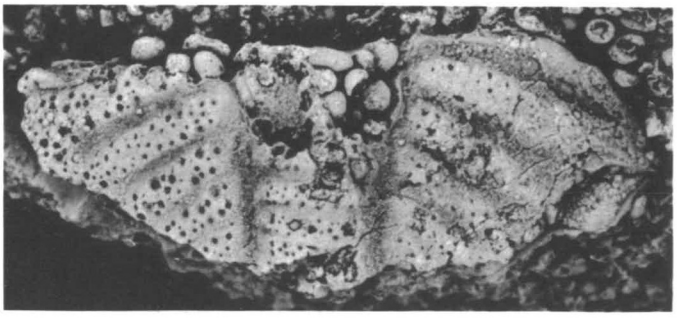

1


2


3

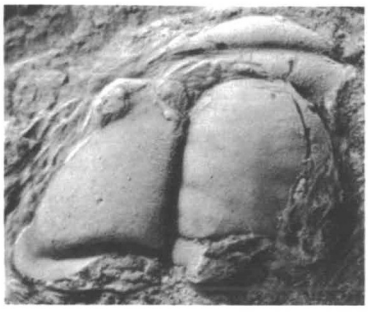

4

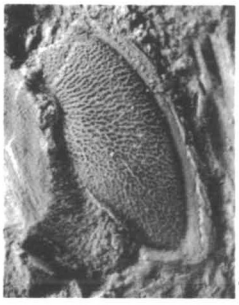

6


5


7

9




10


8

PLATE 47

Figures 1-7 *Tsinania* (*Tsinania*) *nomas* sp. nov. .... page 202
All specimens from the Black Mountain section

Figure 1 CPC 11948, **holotype,** exfoliated cranidium showing extent of preglabellar field, preocular areas, and cranidial border, duplicated ocular ridges, glabellar muscle scar impressions, and nuchal node; horizon K138; x8.

Figure 2 CPC 11949, testaceous cranidium, mainly effaced, but showing traces of anterior cranidial border; horizon K142; x8.

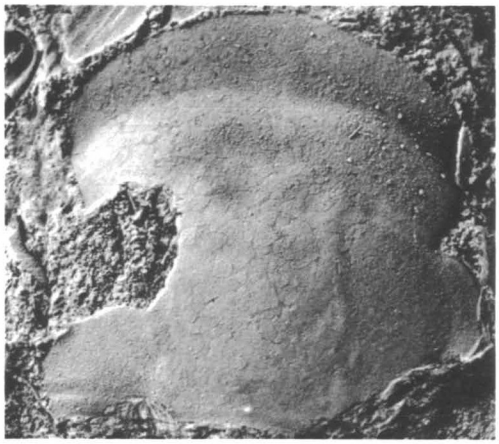
Figure 3 CPC 11950, early holaspid pygidium retaining thin layer of shell, having triangular pleural zone with effaced furrowing; horizon K138; x8.

Figure 4 CPC 11951, testaceous pygidium, largely effaced, retaining only traces of border; horizon K143; x8.

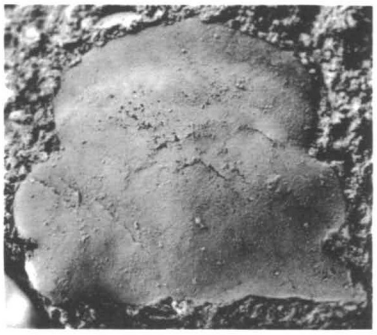
Figure 5 CPC 11952, exfoliated pygidium revealing segmentation and extent of border on parietal surface; horizon K138; x4.

Figure 6 CPC11953, testaceous late holaspid pygidium, almost entirely effaced; horizon K142; x5.

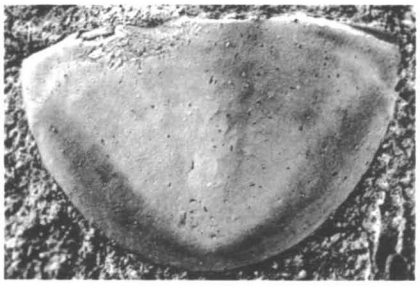
Figure 7 CPC 11954, testaceous librigena with eye socle, lateral marginal furrow becoming effaced anteriorly; horizon K140; x7.



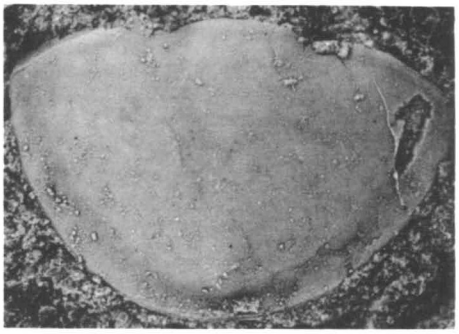
1



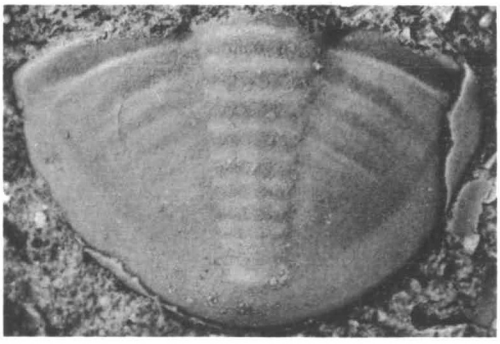
2



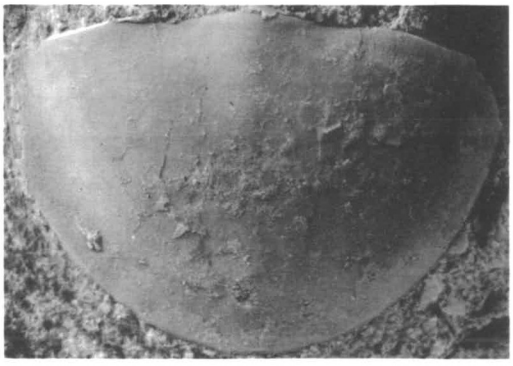
3



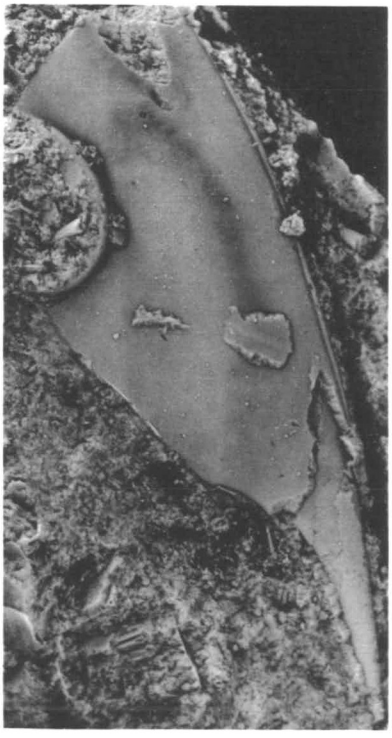
4



5



6



7

PLATE 48

Figures 1-8 *Tsinania* (*Tsinania*) *necopina* sp. nov. .... page 204
All specimens from the Black Mountain section

Figure 1 CPC 11955, **holotype,** partly exfoliated late holaspid cranidial fragment showing distribution of glabellar muscle scars; thick shell; horizon K138; x4.

Figure 2 CPC 11956, early holaspid cranidial fragment showing anterior cranidial border laterally upturned, extent of posterolateral limbs, and distribution of glabellar muscle scars; horizon K138; x8.

Figure 3 CPC 11957, nearly exfoliated meraspid cranidium with upturned anterior cranidial border, large palpebral lobes, and glabellar muscle scar impressions; horizon B510b; x12.

Figure 4 CPC 11958, exfoliated late holaspid cranidial fragment with flat-lying border, ocular ridges, glabellar muscle scar impressions, and bacculae; horizon G510b; x3.5.

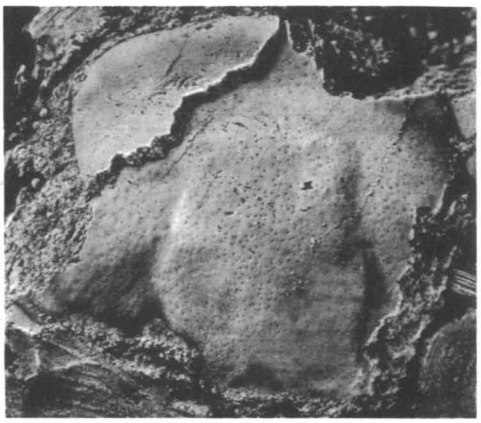
Figure 5 CPC 11959, testaceous early holaspid pygidium retaining triangular shape and effaced to a high degree; horizon K138; x8.

Figure 6 CPC 11960, exfoliated meraspid pygidium with triangular shape, well defined borders, and anterolateral spines; horizon K138; x16.

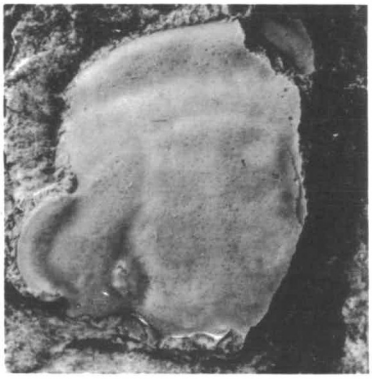
Figure 7 CPC 11961, exfoliated meraspid pygidium as above, with attached thoracic segments; horizon K139; x16.

Figure 8 CPC 11962, testaceous early holaspid pygidium, triangular in shape and virtually effaced; horizon B510b; x8.

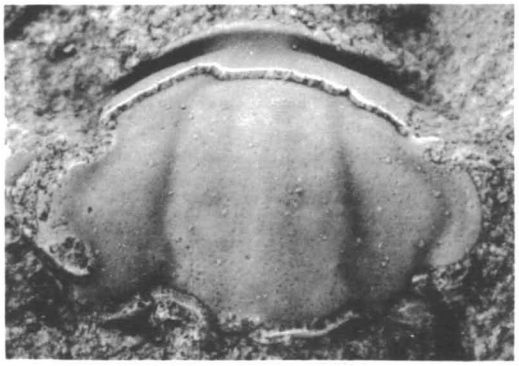
2



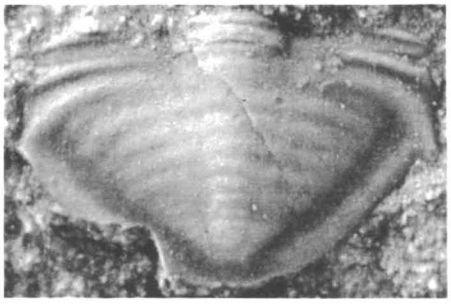
1



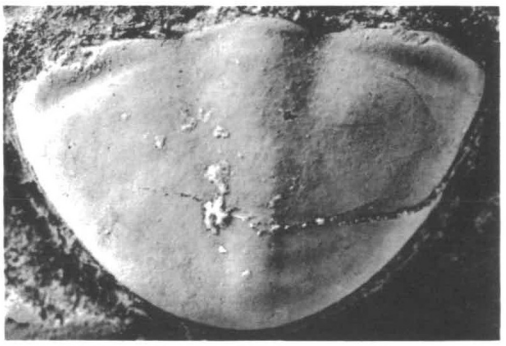
4



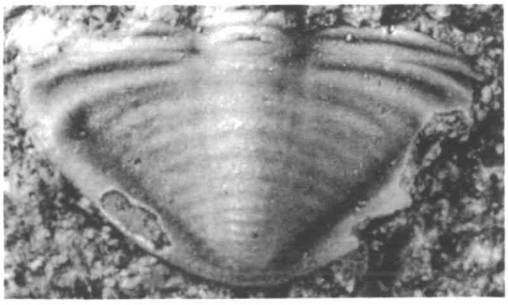
3



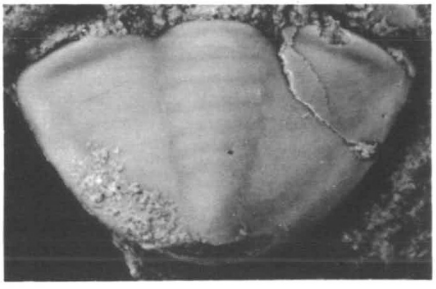
6



5



7



8

PLATE 49

Figures 1-8 *Tsinania* (*Dictyites*) *antidictys* sp. nov. .... page 207
All specimens from the Black Mountain section

Figure 1 CPC 11967, **holotype,** exfoliated holaspid cranidium showing extent of anterior cranidial border and parietal glabellar morphology; horizon K135; x8.

Figure 2 CPC 11968, partly exfoliated early holaspid or late meraspid cranidium, having a well defined cranidial border; horizon K135; x8.

Figure 3 CPC 11969, exfoliated librigena, highly effaced, with short genal spine and eye socle; horizon K135; x8.

Figure 4 CPC 11970, early holaspid cranidium having distinct mansuyiinid appearance; horizon K135; x8.

Figure 5 CPC 11971, exfoliated meraspid pygidium with well defined borders and antero-lateral spines; horizon K135; x8.

Figure 6 CPC 11972, late meraspid or early holaspid pygidium with resorbed spines; horizon K135; x8.

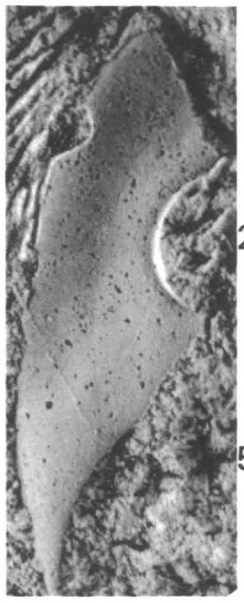
Figure 7 CPC 11973, latex cast from meraspid pygidial mould, showing long anterolateral spines, and attached thoracic segment; horizon K135; x12.

Figure 8 CPC 11974, exfoliated holaspid pygidium showing extent of borders; horizon K135; x8.

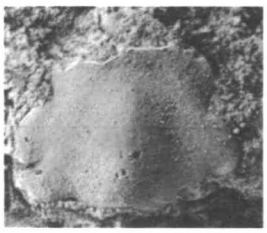
Figures 9-10 *Tsinania* (*Tsinania*) *necopina* sp. nov. .... page 204
Both specimens from the Black Mountain section

Figure 9 CPC 11963, exfoliated librigena, anteriorly incomplete, with eye socle; horizon K138; x16.

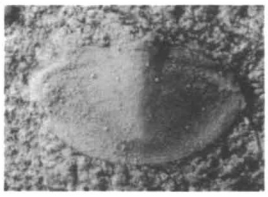
Figure 10 CPC 11964, large exfoliated late holaspid pygidium showing faint traces of border, degree of segmentation, and caecal network; horizon K138; x2.



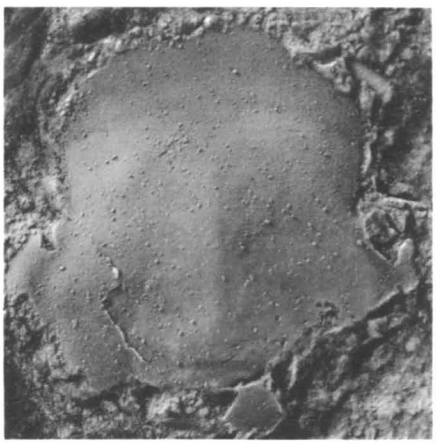
3



2

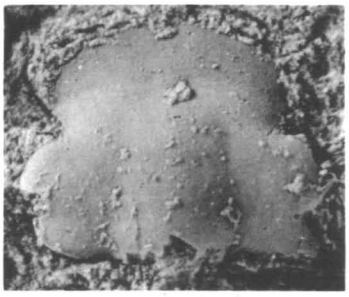


5

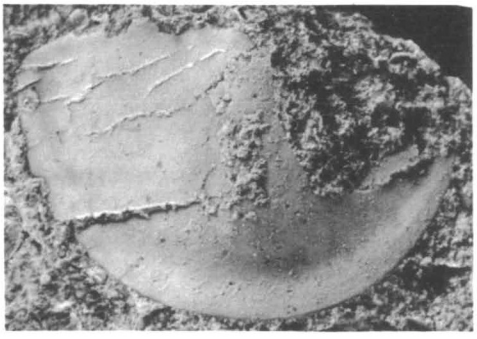


1

6

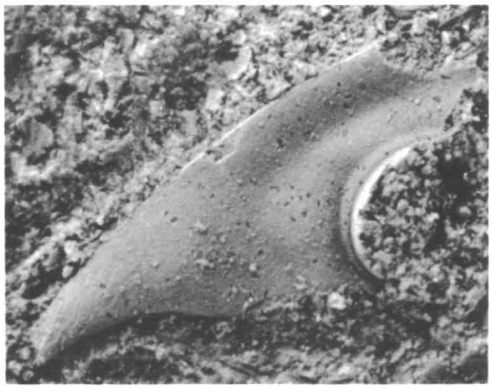


4

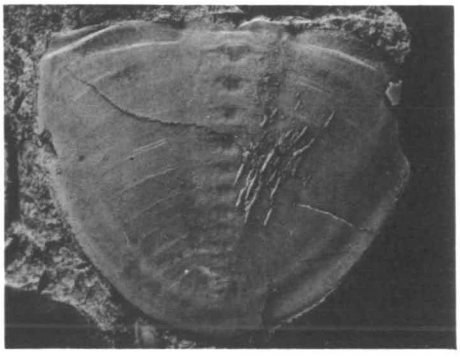


8

7



9



10

PLATE 50

Figures 1-2 *Tsinania* (*Tsinania*) cf. *pagoda* Sun, 1924 .... page 201

Figure 1 CPC 11965, fragmentary testaceous pygidium, largely effaced, with elongate outline; Mount Ninmaroo section, horizon K166; x8.

Figure 2 CPC 11966, testaceous cranidium with high degree of effacement; Black Mountain section, horizon K143; x8.

Figures 3-9 *Tsinania* (*Dictyites*) cf. *trigonalis* Kobayashi, 1933 .... page 209

Figure 3 CPC 11975, exfoliated cranidium showing parietal morphology overlain by faint granulosity; Mount Ninmaroo section, horizon K169; x14.

Figure 4 CPC 11976, partly exfoliated cranidium with thick shell; Dribbling Bore section, horizon B777; x4.

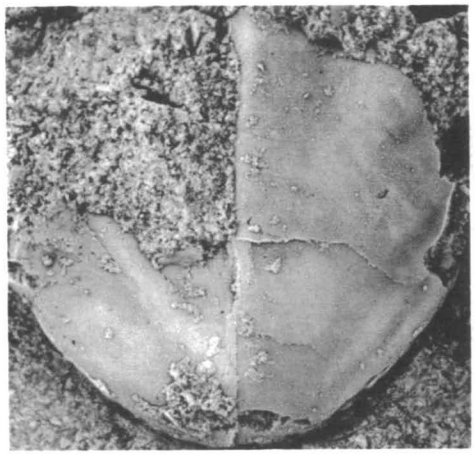
Figure 5 CPC 11977, testaceous librigena with eye socle; Mount Ninmaroo section, horizon K168; x8.

Figure 6 CPC 11978, latex cast from parietal surface of cranidium with pronounced plectrum; Dribbling Bore section, horizon B777; x7.

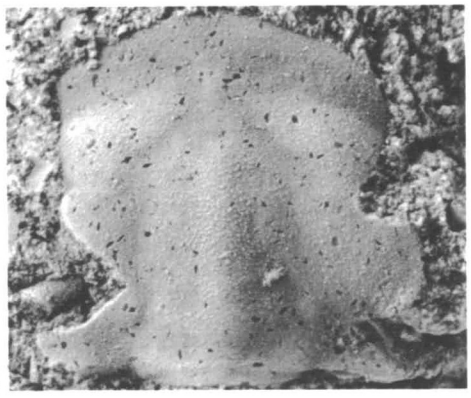
Figure 7 CPC 11979, late holaspid testaceous pygidium with depressed border; Dribbling Bore section, horizon K186; x3.

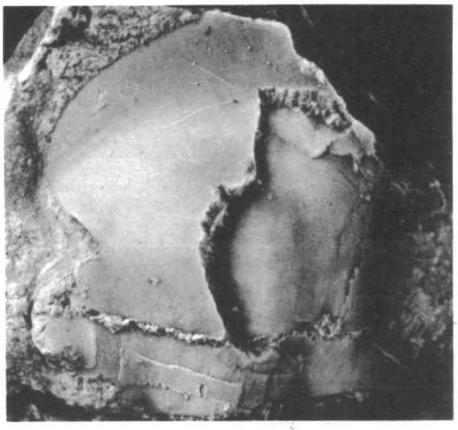
Figure 8 CPC 11980, latex cast from exfoliated early holaspid pygidium showing parietal morphology; Dribbling Bore section, horizon K187; x8.

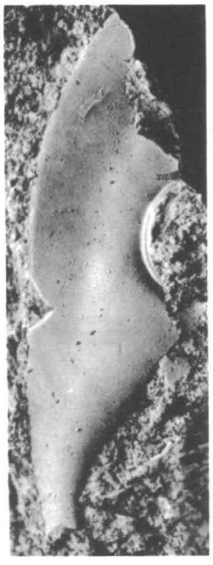
Figure 9 CPC 11981, exfoliated meraspid pygidium showing anterolateral spines and attached thoracic segment; Mount Ninmaroo section, horizon K169; x16.

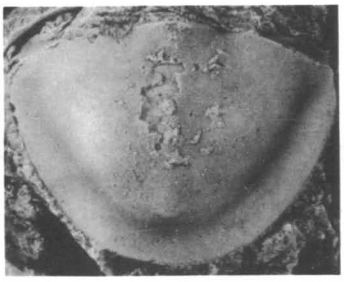

1

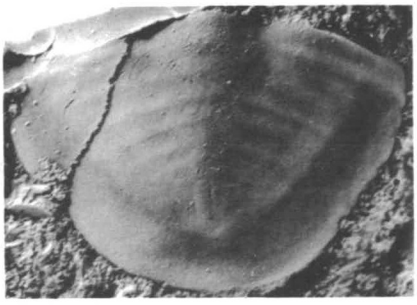

2

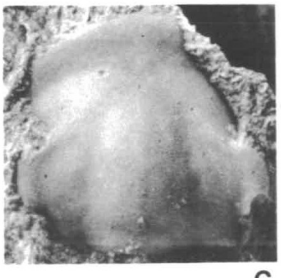

3


4


5


7


8


6


9

PLATE 51

Figures 1-2 *Mendosina* sp. .... page 158

Figure 1 CPC 12875, testaceous cranidial fragment showing caecal network of preglabellar field; Black Mountain section; horizon B507b; x8.

Figure 2 CPC 12874, latex cast of parietal surface of cranidial fragment preserving caecal network of preglabellar field; Black Mountain section, horizon K106; x9.

Figure 3 *Maladioidella* sp. .... page 153

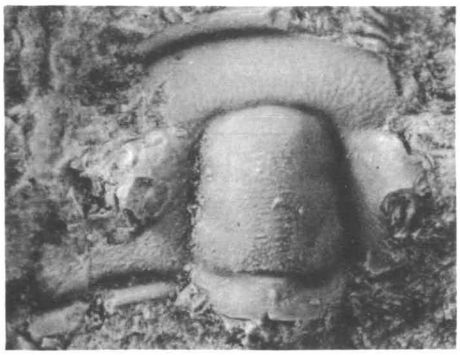
Figure 3 CPC 11996, exfoliated cranidial mould with wide (sag.) preglabellar field and pitted anterior cranidial marginal furrow; Dribbling Bore section, horizon K189; x14.

Figures 4-6 *Maladioidella* cf. *chinchiaensis* Endo, 1937 .... page 152
All specimens from the Black Mountain section

Figure 4 CPC 11997, latex cast from exfoliated cranidial fragment; horizon K121; x8.

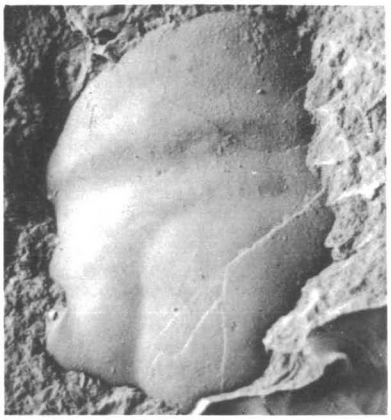
Figure 5 CPC 11998, exfoliated cranidial fragment showing arrangement of muscle scar impressions in rear of glabella, associated with type cephalon of *Pseudagnostus clarki maximus;* horizon K121; x4.

Figure 6 CPC 11999, testaceous librigena with eye socle; horizon K121; x4.5.

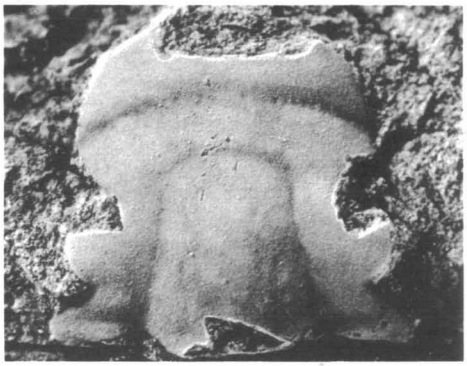


1

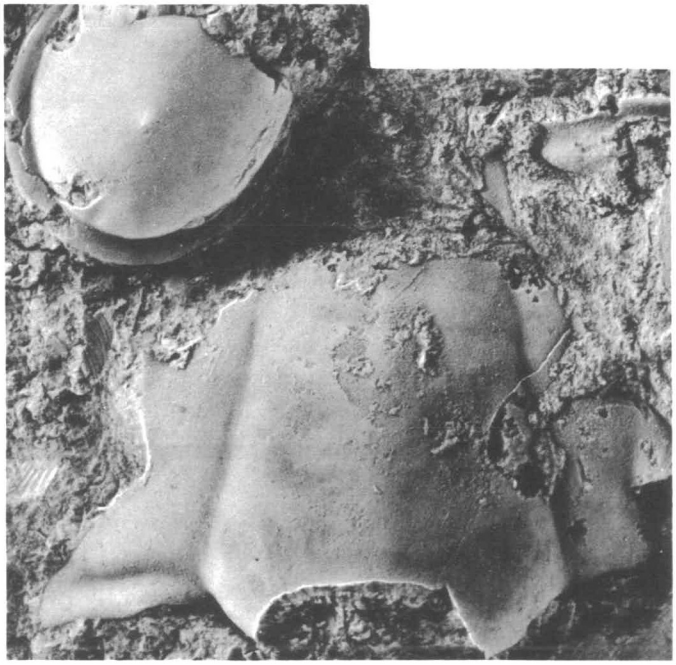
2



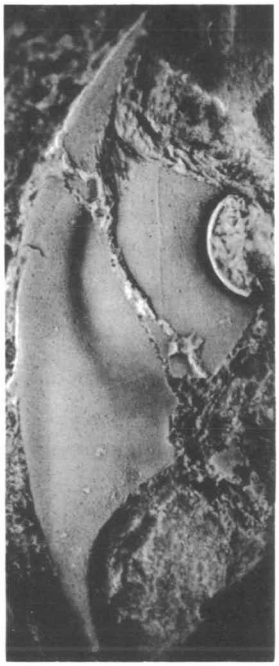
4



3



5



6

PLATE 52

Figures 1-4 *Wanwanaspis* cf. *semicircularis* Kobayashi, 1933 .... page 107

Figure 1 CPC 11982, poorly preserved partly exfoliated librigenal fragment; Mount Datson section, horizon K178; x4.

Figure 2 CPC 11983, partly exfoliated highly convex (sag.) cranidium showing a narrow (tr.) upturned anterior cranidial border; Mount Datson section, horizon K178; x8.

Figure 3 CPC 11984, testaceous pygidium showing posterior pointing, and complete effacement of surface morphology; Mount Ninmaroo section, horizon K168; x12.

Figure 4 CPC 11985, exfoliated pygidium showing segmentation; Black Mountain section, horizon K137; x9.

Figure 5 *?Wanwanaspis* sp. undet. .... page 109

Figure 5 CPC 11986, small largely exfoliated pygidium showing traces of segmentation; Black Mountain section; horizon K131; x9.

Figures 6-7 *Wanwanaspis pygidion* sp. nov. .... page 108

Figure 6 CPC 11987, **holotype,** testaceous pygidium; Black Mountain section, horizon K138; x16.

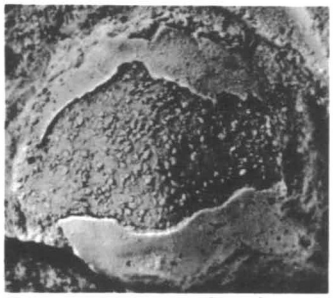
Figure 7 CPC 11988, exfoliated pygidium showing segmentation; Black Mountain section, horizon K138; x14.

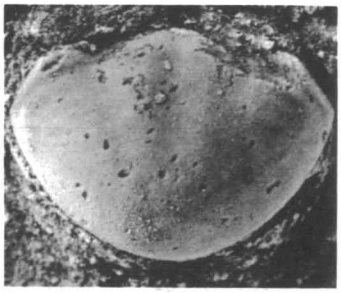
Figures 8-9 *Wuhuia* cf. *W. dryope* (Walcott, 1905) .... page 106

Figure 8 CPC 12856, partly exfoliated cranidium with finely granulose test; Black Mountain section, horizon K103; x6.

Figure 9 CPC 12856, lateral aspect of above; x6.

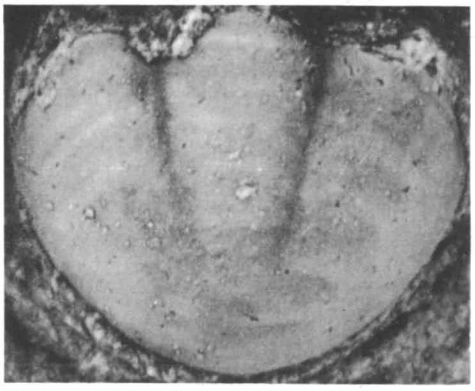

1


2

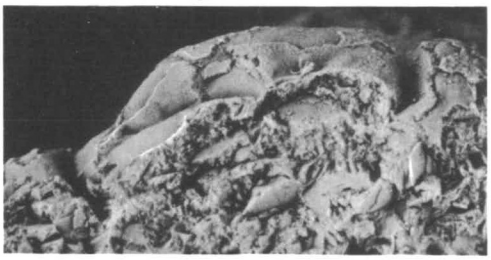

3


4


5


6


7


8


9

PLATE 53

Figures 1-8 *Lorrettina macrops* Shergold, 1972 .... page 104
All specimens from the Black Mountain section

Figure 1 CPC 11989, latex cast from external mould of holaspid pygidium; horizon K117; x8.

Figure 2 CPC 11990, partly exfoliated librigena showing short, thorn-like laterally deflected genal spine; horizon K118; x12.

Figure 3 CPC 11991, partly exfoliated late holaspid cranidium, anterior view; horizon K116; x7.5.

Figure 4 CPC 11992, lateral view of testaceous cranidium with strong sagittal convexity; horizon K116; x6.

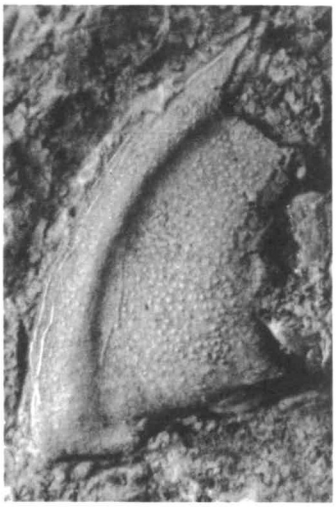
Figure 5 CPC 11991, dorsal view of Figure 3, showing thick test; horizon K116; x7.5.

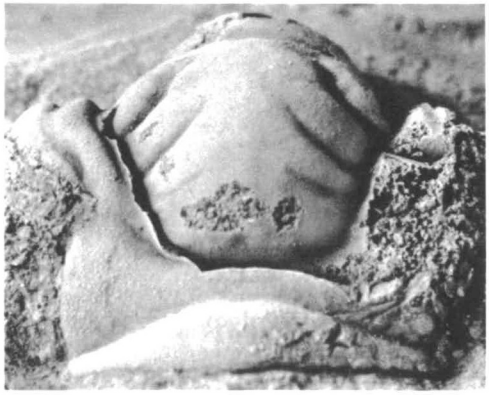
Figure 6 CPC 11993, partly exfoliated early holaspid pygidium; horizon K117; x10.

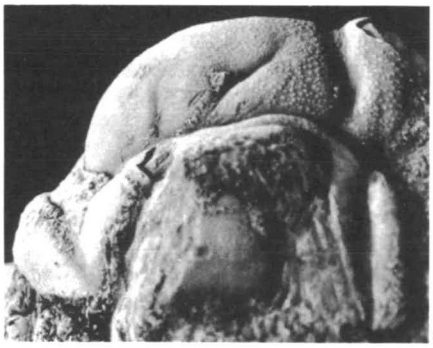
Figure 7 CPC 11994, partly exfoliated early holaspid cranidium with narrow (tr.) glabella; horizon K117; x10.

Figure 8 CPC 11995, early holaspid cranidium showing fine testaceous granulation; horizon K118; x9.


1

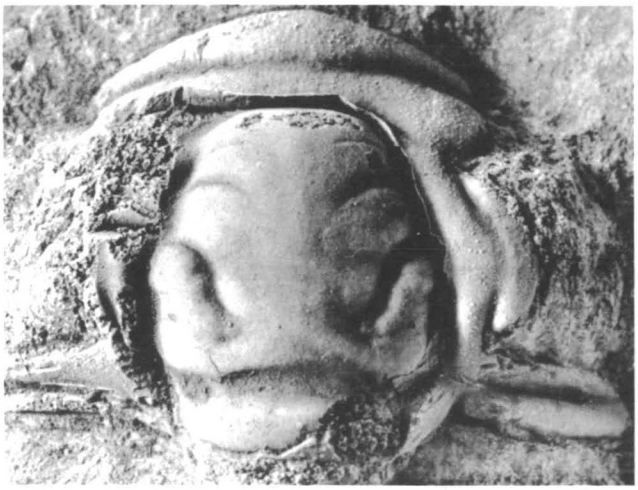

2


3


4


6


7


5

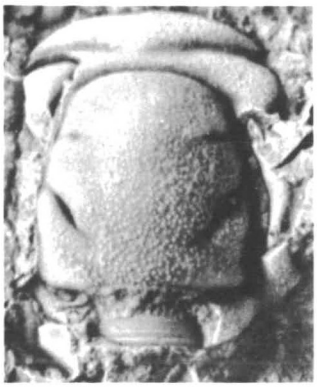

8

PLATE 54

Figures 1-6 *Atopasaphus stenocanthus* sp. nov. .... page 218
All specimens from the Black Mountain section

Figure 1 CPC 12882, testaceous pygidium showing effaced segmentation and faint post-axial ridge; horizon K116; x8.

Figure 2 CPC 12883, large holaspid pygidium as above; horizon K116; x9.

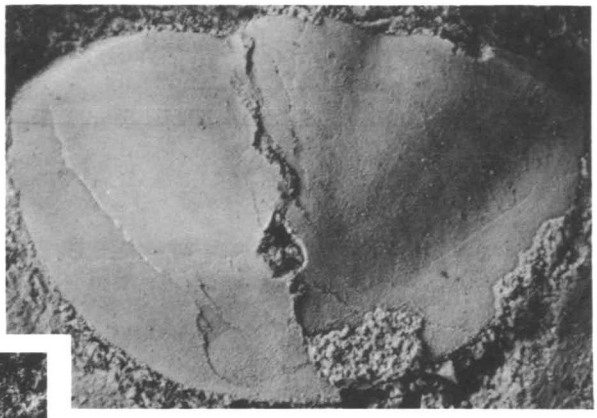
Figure 3 CPC 12884, latex cast from parietal surface of pygidial fragment with visible segmentation and wide doublure; horizon K111; x6.

Figure 4 CPC 12885, poorly preserved partly exfoliated cranidium; horizon K109; x4.5.

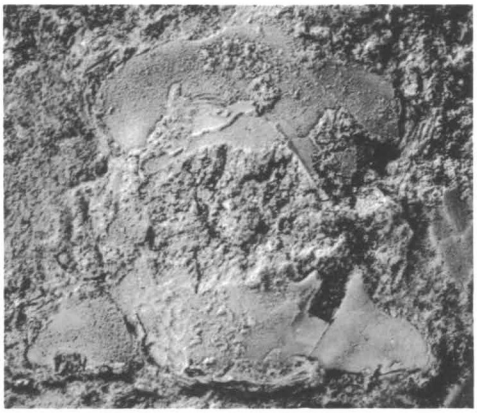
Figure 5 CPC 12885, as above, lateral aspect; x4.5.

Figure 6 CPC 12886, **holotype,** large partly exfoliated cranidium (more than 14 mm long), showing extent of preglabellar area and posterolateral limbs, and size and position of palpebral lobes; horizon K116; x6.

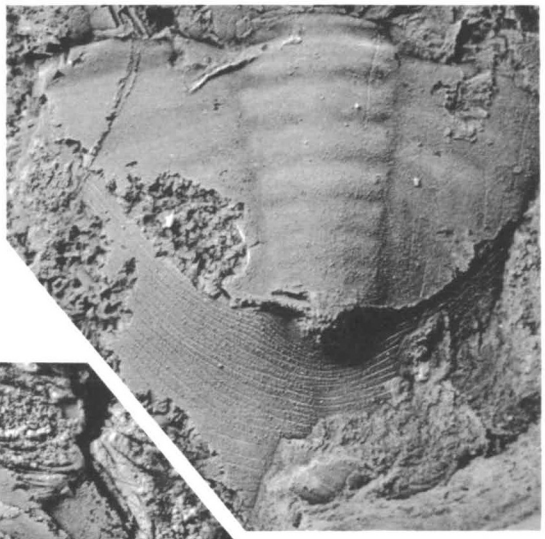
1



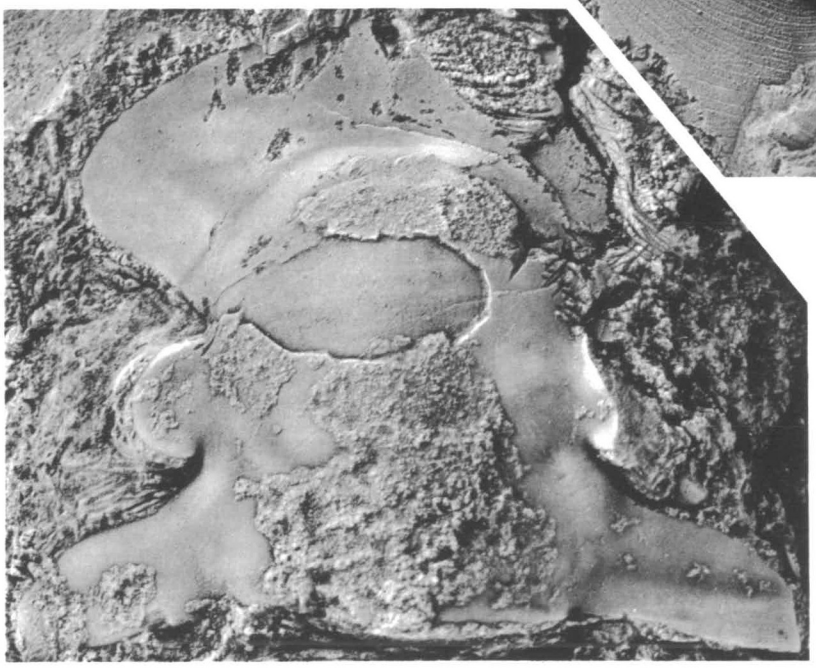
2



4



3



6

5

PLATE 55

Figures 1-8 *Golasaphus simus* sp. nov. .... page 214
All specimens from the Black Mountain section

Figure 1 CPC 12867a, **holotype,** incomplete partly exfoliated cranidium showing features of the preglabellar area; horizon K121; x8.

Figure 2 CPC 12867b, latex cast from the **holotype** showing glabellar shape and relationship of glabella to preglabellar area and palpebral lobes; horizon K121; x8.

Figure 3 CPC 12868, testaceous pygidium illustrating degree of effacement; horizon K119; x9.

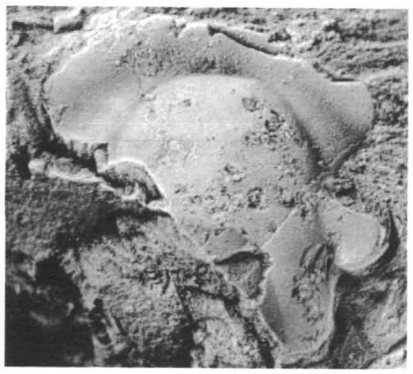
Figure 4 CPC 12869, exfoliated pygidium showing extent of doublure; horizon K119; x9.

Figure 5 CPC 12870, partly exfoliated pygidium; horizon K119; x9.

Figure 6 CPC 12871, partly exfoliated pygidium; horizon K119; x7.

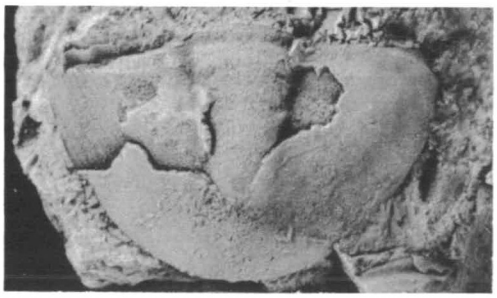
Figure 7 CPC 12872, latex cast from exfoliated hypostomal fragment; horizon K121; x8.

Figure 8 CPC 12873, testaceous pygidium illustrating axial characteristics; horizon K119; x8.

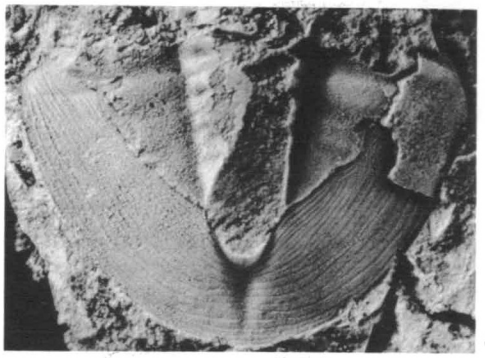

1

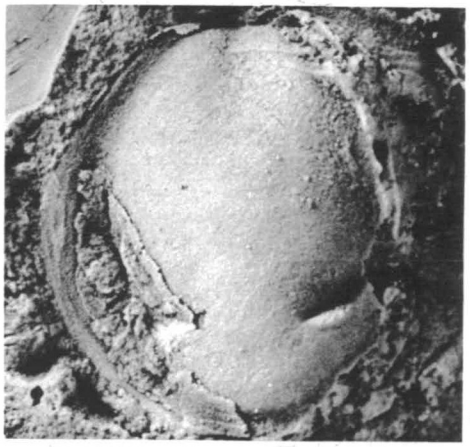

2


5


6


3


4


7


8

PLATE 56

Figures 1-9 *Golasaphus triquetrus* sp. nov. .... page 212
All specimens from the Black Mountain section

Figure 1 CPC 12858, testaceous pygidium, showing general shape, degree of effacement, and extent of border; horizon K121; x8.

Figure 2 CPC 12859, pygidium as above; horizon K121; x9.

Figure 3 CPC 12860, partly exfoliated pygidium illustrating axial segmentation; horizon K121; x8.

Figure 4 CPC 12861, meraspid pygidium with attached thoracic segments; horizon K121; x8.

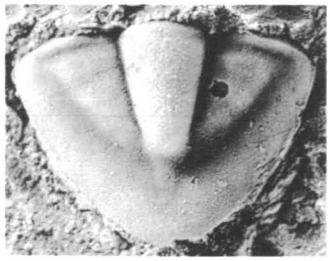
Figure 5 CPC 12862, large exfoliated late holaspid pygidium showing segmentation; horizon K121; x9.

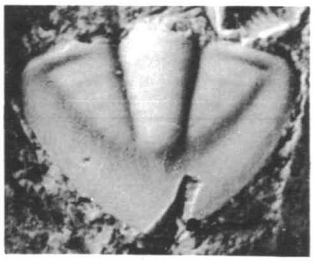
Figure 6 CPC 12863, detail of latex cast from cranidium showing preglabellar area bisected by a sagittal keel; horizon K121; x8.

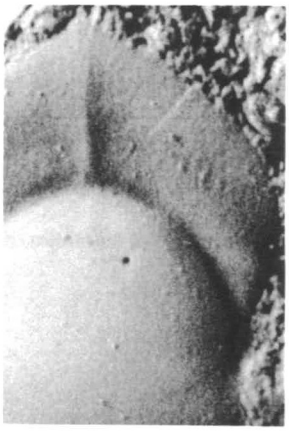
Figure 7 CPC 12864, detail of latex cast from exfoliated cranidium showing parietal morphology of glabella; horizon K121; x14.

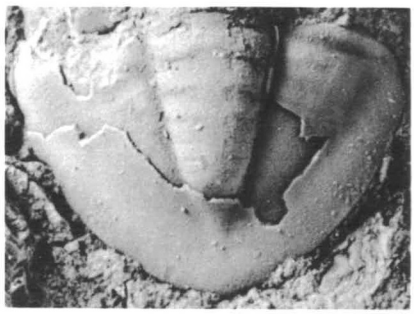
Figure 8 CPC 12865, **holotype,** an incomplete cranidium showing glabellar shape and extent of posterolateral limbs; horizon K121; x9.

Figure 9 CPC 12866, partly exfoliated cranidium, as above; horizon K121; x8.


1

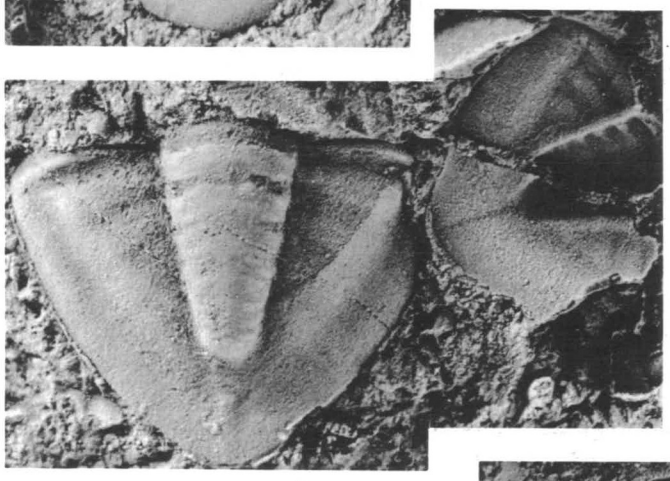

2

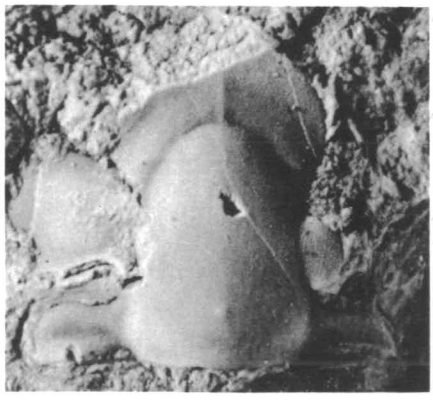

6


3


4


7


5


8

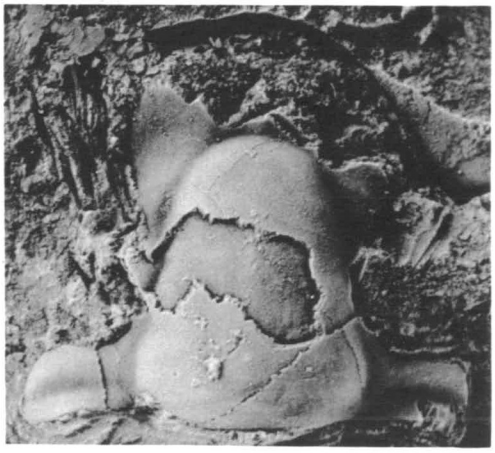

9

PLATE 57

Figures 1-3 *?Niobella* sp. .... page 216
All specimens from the Dribbling Bore section

Figure 1 CPC 12878, partly exfoliated pygidial fragment showing pleural furrows deepened at border; horizon K195; x7.

Figure 2 CPC 12879, testaceous pygidial fragment; horizon K195; x8.

Figure 3 CPC 12880, latex cast from exfoliated pygidial mould showing degree of segmentation; horizon K195; x3.

Figure 4 *?Symphysurina* sp. .... page 217

Figure 4 CPC 12881, librigenal fragment with laterally directed and distally curved spine; Dribbling Bore section; horizon K195; x6.

Figure 5 Asaphacean hypostoma undet. .... page 219

Figure 5 CPC 12887, partly exfoliated hypostomal fragment; Dribbling Bore section, horizon K195; x8.

Figures 6-8 *?Asaphellus* sp. .... page 216

Figure 6 CPC 12876, incomplete exfoliated cranidium, lateral aspect; Black Mountain section, horizon K151; x8.

Figure 7 CPC 12876, as above, dorsal view; x8.

Figure 8 CPC 12877, latex cast of pygidial fragment possibly belonging to this species; Black Mountain section, horizon K151; x4.

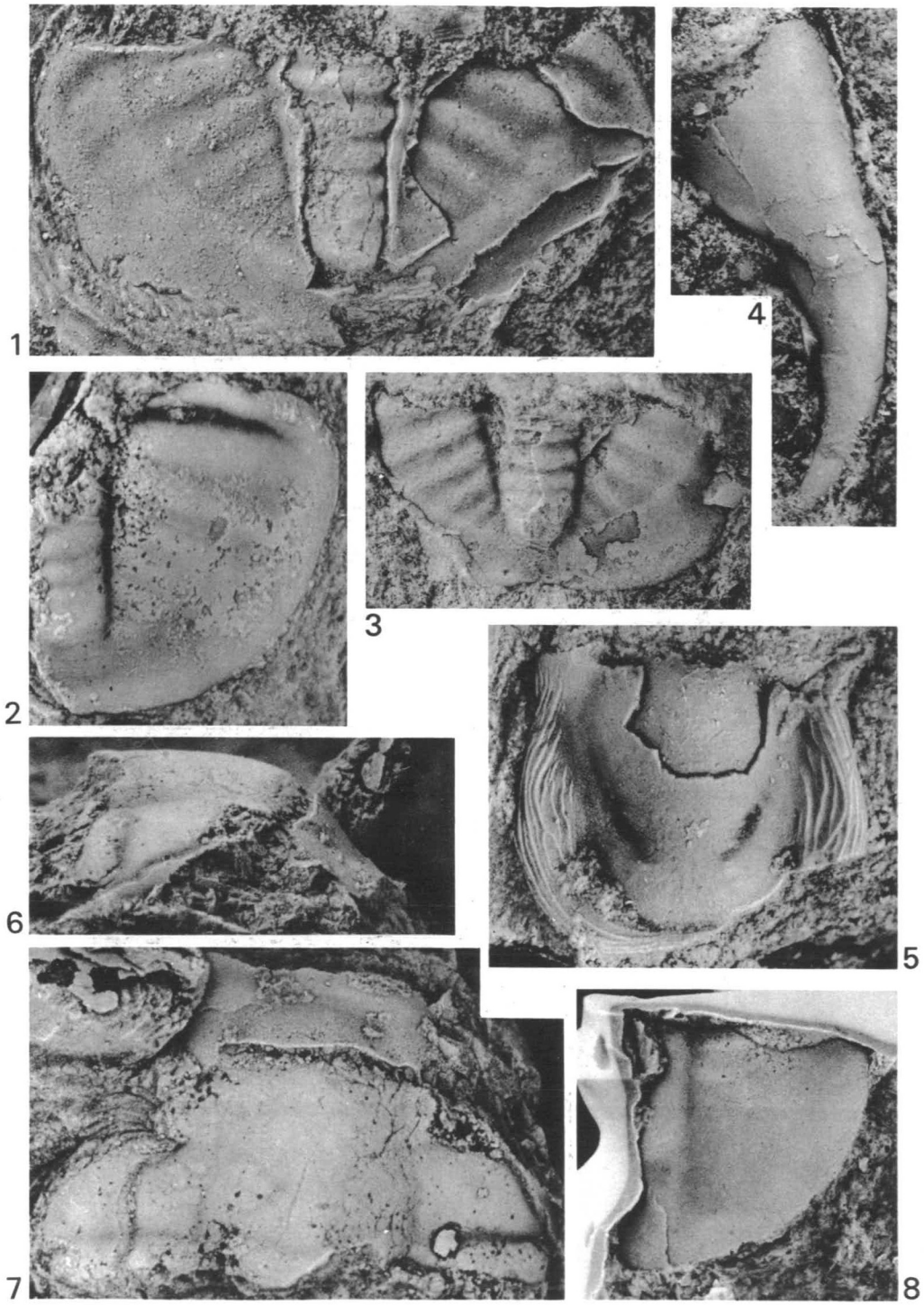

1
2
3
4
5
6
7
8

PLATE 58

Figures 1-4 *Koldinioidia* cf. *cylindrica* (Shergold, 1972) .... page 100
All specimens from the Black Mountain section

Figure 1 CPC 12890, exfoliated cephalic mould showing apparent fusion of front of glabella with preglabellar area; horizon K104; x20.

Figure 2 CPC 12891, exfoliated cephalic mould, as above; horizon K106; x20.

Figure 3 CPC 12892, small testaceous cephalon showing degree of taper of frontal glabellar lobe, and weak nuchal node; horizon K103; x20.

Figure 4 CPC 12893, small testaceous cephalon; horizon K103; x20.

Figures 5-10 *Koldinioidia payntonensis* sp. nov. .... page 101
All specimens from the Black Mountain section

Figure 5 CPC 12894, testaceous cephalon showing marked angulation at apex of frontal lobe; horizon K139; x16.

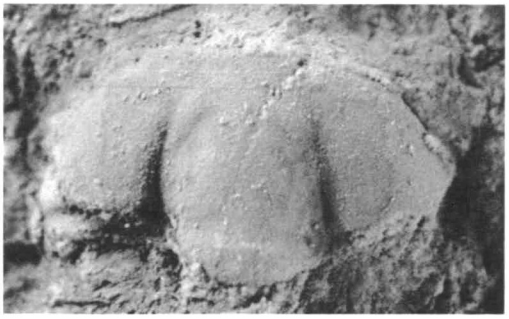
Figure 6 CPC 12895, partly exfoliated cephalon; horizon K139; x16.

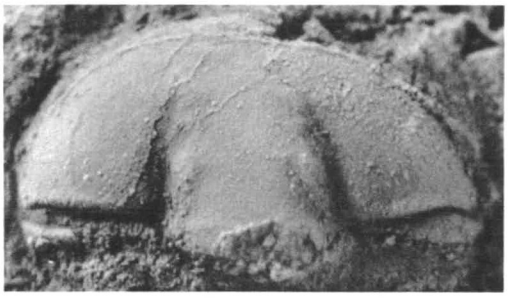
Figure 7 CPC 12896, **holotype,** testaceous cephalon showing complete occipital ring, glabellar furrowing, and finely granulose prosopon; horizon B510; x16.

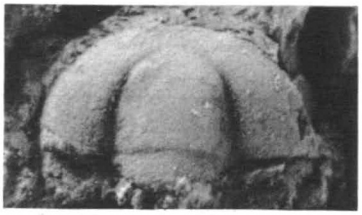
Figure 8 CPC 12897, small testaceous cephalon with genal spine; horizon K139; x16.

Figure 9 CPC 12898, small testaceous cephalon; horizon K138; x16.

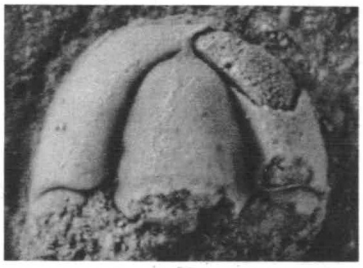
Figure 10 CPC 12899, latex cast from external cephalic mould; horizon K138; x28.


1

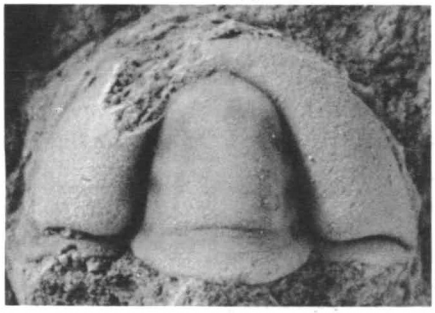

2

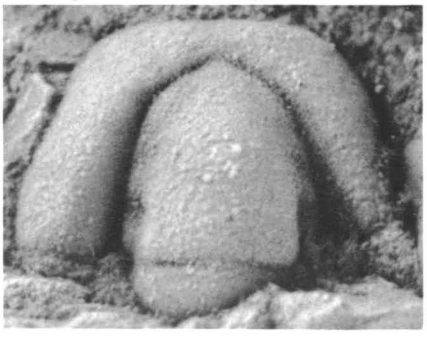

3

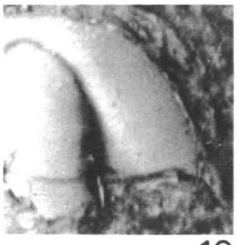

4

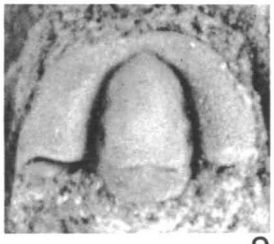

6


5


7


8


10


9