BIOSTRATIGRAPHIC AND TAXONOMIC STUDIES
OF SOME
TASMANIAN CAMBRIAN TRILOBITES

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CONTENTS

SUMMARY (i)
STATEMENT (iv)
ACKNOWLEDGEMENTS (v)

GENERAL INTRODUCTION 1

PART I -- STRATIGRAPHY 5

Introduction 5

1. Dundas Area 12
   Introduction 12
   Problem of the "Judith Slate" Fauna 14
   A. Mt. Razorback-Misery Hill Sequence 16
   B. Black Hill Section 25
   C. North-East Dundas Tram--Ring River Area 31

2. Huskisson River Area 32

3. Farrell Rivulet--Menty River--Gieves Tram Areas 36

4. Zeehan Area 38

5. South-Central Tasmania 40
   a. Denison Range 40
   b. Adamsfield Area 41
   c. Scotts Peak Road 42
6. South-West Tasmania
7. Que River Area
8. Queenstown Area
9. Bathurst Harbour Area
10. New River Lagoon Area
11. St. Valentin's Peak Area
12. North-West Coast
13. Circular Head
14. Deloraine - Golden Valley
15. Cressey
16. Beaconsfield Area
17. Port Sorell
18. Waratah Area

STRATIGRAPHICAL AND PALAEOGEOGRAPHICAL CONCLUSIONS

PART II -- PALAEOLOGY

Introduction
Methods
Distortion of Fossils

PALAEOECOLOGY

Assemblage (1)--Agnostid assemblage
Assemblage (2)--Ptychagnostid--non-cepheid assemblage
Assemblage (3)--Nepheid-clavagnostid-paraepheid assemblage
Other Tasmanian Middle Cambrian and Early Upper Cambrian faunas

Summary

Comparisons with other Cambrian faunas

CLASSIFICATION AND MORPHOLOGY OF AGNOSTID TRILOBITES

SYSTEMATIC DESCRIPTIONS

Phylum ARTHROPODA Siebold and Stannius, 1845

Class TRILOBITA Walch, 1771

Order MIIOMERA Jaekel, 1909

Suborder AGNOSTINA Salter, 1864

Superfamily AGNOSTACEA M'Coy, 1849

Family AGNOSTIDAE M'Coy, 1849

Subfamily QUADRAGNOSTINAE Howell, 1935

Genus Peronopsis Hawle and Corde, 1847

Peronopsis gullini sp. nov.

Peronopsis ekin sp. nov.

Peronopsis sp. 1

Peronopsis sp. 2

Peronopsis ? sp. 1

Genus Hypagnostus Jaekel, 1909

Hypagnostus cf. brevifrons (Angelin)

Hypagnostus sp. eff. H. parvifrons (Linnénsen)

Hypagnostus sp.
Genus *Grandagnostus* Howell, 1935

*Grandagnostus* sp.

Genus *Valagnostus* nov.

*Valagnostus banksii* sp. nov.

*Valagnostus brittoni* sp. nov.

*Valagnostus* sp. 1

*Valagnostus (?)* sp.

Genus *Pseudofalacroma* Pokrovskaya, 1958

*Pseudofalacroma ?* sp.

Genus *Birchagnostus* nov.

*Birchagnostus inleati* sp. nov.

Subfamily *PTYCHAGNOSTINAE* Kobayashi, 1939

Genus *Ptychagnostus* Jaekel, 1909

*Ptychagnostus (Ptychagnostus) stenorrhachis* (Grönwall)

*Ptychagnostus (Ptychagnostus) hodgei* sp. nov.

*Ptychagnostus (Ptychagnostus) cf. aculeatus* (Angelin)

*Ptychagnostus (Ptychagnostus) sp.

*Ptychagnostus ? murchisoni* sp. nov.

*Ptychagnostus (Goniagnostus) rubenachii* sp. nov.

*Ptychagnostus (Goniagnostus) buckleyi* sp. nov.

*Ptychagnostus (Goniagnostus) sp.

*Ptychagnostus ?* sp. 1

*Ptychagnostus* spp.
Genus Leiponyx Hawle and Corda, 1847

?Leiponyx laevigata (Dalman)

Leiponyx laevigata armata (Linnarsson)

Leiponyx (?) sp.

Subfamily AGNOSTINAE McCoy

Genus Agnostus Brongniart, 1822

Agnostus sp. 1

Agnostus sp. 2

Agnostus (?) sp.

Genus Idolagnostus Upik, 1967

Idolagnostus sp.

Genus Geragnostus Howell, 1935

Geragnostus sp. 1

Geragnostus sp. 2

Geragnostus sp. 3

Genus Armargagnostus Resser, 1938

Armargagnostus sp.

Genus Cyclagnostus Lermontova, 1940
cf. Cyclagnostus sp.

Genus Lotagnostus Whitehouse, 1936

Lotagnostus sp. aff. L. trisectus (Salter)

?Lotagnostus sp.
Family CLAVAGNOSTIDAE Howell, 1937

Subfamily CLAVAGNOSTINAE Howell, 1937

Genus *Clavagnostus* Howell, 1937

*Clavagnostus* milli sp. nov.
*Clavagnostus* burnsii sp. nov.
*Clavagnostus* rawlingi sp. nov.
*Clavagnostus* sp. 1
*Clavagnostus* sp. 2
*Clavagnostus* sp. 3
*Clavagnostus* sp. 4

Genus *Pseudoclavagnostus* nov.

*Pseudoclavagnostus* sinoeorensis sp. nov.
*Pseudoclavagnostus* (?) naval sp. nov.
*Pseudoclavagnostus* (?) inara sp. nov.

Subfamily ASPIDAGNOSTINAE Pokrovskaya, 1960

Genus *Aspidagnostus* Whitehouse, 1936

*Aspidagnostus* riani sp. nov.
*Aspidagnostus* cf. *riani*
*Aspidagnostus* sp. 1
*Aspidagnostus* sp. 2
*Aspidagnostus* sp. 3
*Aspidagnostus* sp. 4
Family DIPLAGNOSTIDAE Whitehouse, 1936

Subfamily DIPLAGNOSTINAEE

Genus Diplagnostus Jaekel, 1909

Diplagnostus nepi sp. nov.
Diplagnostus sp. 1
Diplagnostus sp. 2
Diplagnostus sp. 3
Diplagnostus sp. 4

Genus Dedorhechis Resser, 1938
Dedorhechis (?) distortus sp. nov.
Dedorhechis (?) sp.

Subfamily DIDALagnostinae Opik, 1967

Genus Didalagnostus Westergård, 1946
Didalagnostus sp.

Genus Buckagnostus nov.
Buckagnostus debozi sp. nov.
Buckagnostus compani sp. nov.
Buckagnostus sp.

Subfamily AMMAGNOSTINAE Opik, 1967

Genus Ammagnostus Opik, 1967
Ammagnostus (?) sp.

Genus Kormagnostus Resser, 1938
cf. Kormagnostus sp.

Genus Dagenagnostus nov.
Dagenagnostus keithi sp. nov.
Subfamilia suae

Genus Agnostascus Öpik, 1967

Agnostascus (?) sp. 1
Agnostascus (?) sp. 2
Agnostascus (?) sp. 3
Agnostascus (?) sp. 4
Agnostascus (?) sp. 5

Subfamily PSEUDAGNOSTINAE Whitehouse, 1936

Genus Pseudagnostus Jaekel, 1909

Pseudagnostus corbetti sp. nov.
Pseudagnostus cf. corbetti
Pseudagnostus sp. aff. P. ampullatus Öpik
Pseudagnostus sp. 1
Pseudagnostus sp. 2
Pseudagnostus sp. 3
Pseudagnostus sp. 4
Pseudagnostus sp. 5

Subfamily GLYPTAGNOSTINAE Whitehouse, 1936

Genus Glyptagnostus Whitehouse, 1936

Glyptagnostus reticulatus (Angelini)

Genus Agnostardia Öpik, 1963

Agnostardia sp. 1
Agnostardia sp. 2
Agnostardia sp. 3
Family and Subfamily, Indet.

Agnostid, gen. et sp. indet. no. 1 360
Agnostid, gen. et sp. indet. no. 2 360
Agnostid, gen. et sp. indet. no. 3 361
Agnostid, gen. et sp. indet. no. 4 362
Agnostid, gen. et sp. indet. no. 5 363
Agnostid, gen. et sp. indet. no. 6 365
Agnostid, gen. et sp. indet. no. 7 366
Agnostid, gen. et sp. indet. no. 8 367
Agnostid, gen. et sp. indet. no. 9 368
Agnostid, gen. et sp. indet. no. 10 370
Agnostid, gen. et sp. indet. no. 11 371

Suborder EODISCINA Kobayashi, 1939 372

Family PAGETIIDAE Kobayashi, 1935 373

Genus Opsidiscus Westergard, 1949 379

Opsidiscus arguai sp. nov. 379

POLYMERID TRILOBITES 386

Order PYCHOPARIIDA Swinnerton, 1915 386

Suborder PYCHOPARIINA Richter, 1933 386

Superfamily BURLINGIACEA Walcott, 1908 386

Family BURLINGIIDAE Walcott, 1908 386

Genus Schmalenseeia Moberg, 1903 386

Schmalenseeia gastinensis sp. nov. 390
SUMMARY

The first detailed taxonomic and biostratigraphic studies of Tasmanian Middle and Upper Cambrian trilobites are contained in this thesis. Agnostid trilobites have been studied in considerably greater detail than polymerid trilobites because they provide the best means of local and intercontinental correlation.

Two, and possibly three, distinct agnostid assemblages are recognized in the Tasmanian Middle Cambrian and early Upper Cambrian sequences. These are (1) an agnostid assemblage in which polymerid trilobites are absent, rare or present as thenatocoenotic fossils, (2) a ptychagnostid-non-nepaid assemblage which could be considered as a variation of assemblage (1), and (3) a nepaid-clavagnostid-aronopsid assemblage which does not contain ptychagnostids. It is proposed that assemblage (1) was essentially an open sea fauna with assemblages (2) and (3) occurring progressively closer to the shore.

Taxonomic studies of newly collected material and some previously collected material has led to the recognition and description of over ninety agnostid species and three non-agnostid species. Five genera and twenty-five species are new. About two-thirds of the agnostid species could not be assigned to any particular species, new or old, because of their poor preservation. Large numbers of polymerid trilobites are listed but not described. The availability of
rubber casts of much Australian and particularly overseas type material has allowed detailed comparison to be made of some Tasmanian species with previously described species. These rubber casts have allowed comprehensive revisions to be made of certain agnostid and non-agnostid genera and species.

The main body of Tasmanian fossiliferous Middle and Upper Cambrian sediments was deposited in the Dundas Trough between the Tyennan Geanticline in Central Tasmania and the Rocky Cape Geanticline in the north-west of the island. Other important depositional areas were to the north-west of the Rocky Cape Geanticline and in the Denison Range area of south-central Tasmania. Extending along the western and northern margins of the Tyennan Geanticline was the Mt. Read Volcanic Arc. In the course of this study sediments containing Middle Cambrian trilobites have been found associated with the Mt. Read Volcanics in the Que River and Queenstown areas. This indicates that the Mt. Read Volcanics are at least partly coeval with the fossiliferous Middle and Upper Cambrian sediments found elsewhere in Tasmania, a point which had long been controversial.

It is proposed, largely on the evidence of agnostid age datings, that throughout much of the Upper Cambrian, the seas in Tasmania retreated progressively southwards. It is confirmed that the Tyennan Movement in the latest Upper Cambrian considerably folded
the pre-existing rocks close to the Tyennan Geanticline but had little effect towards the centre of the Dundas Trough. On a continental scale it is proposed that in Middle and Upper Cambrian times Tasmania was the site of a small group of volcanic islands situated off the coast of Gondwanaland.

Previous workers have used the term "Dundas Group" or the term "Dundas Group and correlates" to describe the fossiliferous Middle and Upper Cambrian sediments of Tasmania. However, this study has shown that the use of the term "Dundas Group and correlates" in this sense is invalid, and that the term "Dundas Group" should be restricted to the section between Mt. Razorback and Misery Hill. A new map for the Dundas area is given. This differs considerably from previously published maps. The St. Valentines Peak area has been largely remapped. The first measured section of some of the Cambrian sediments of the Birch Inlet area is presented. Minor stratigraphic corrections have also been made in other areas.