M·A·P·S Digest

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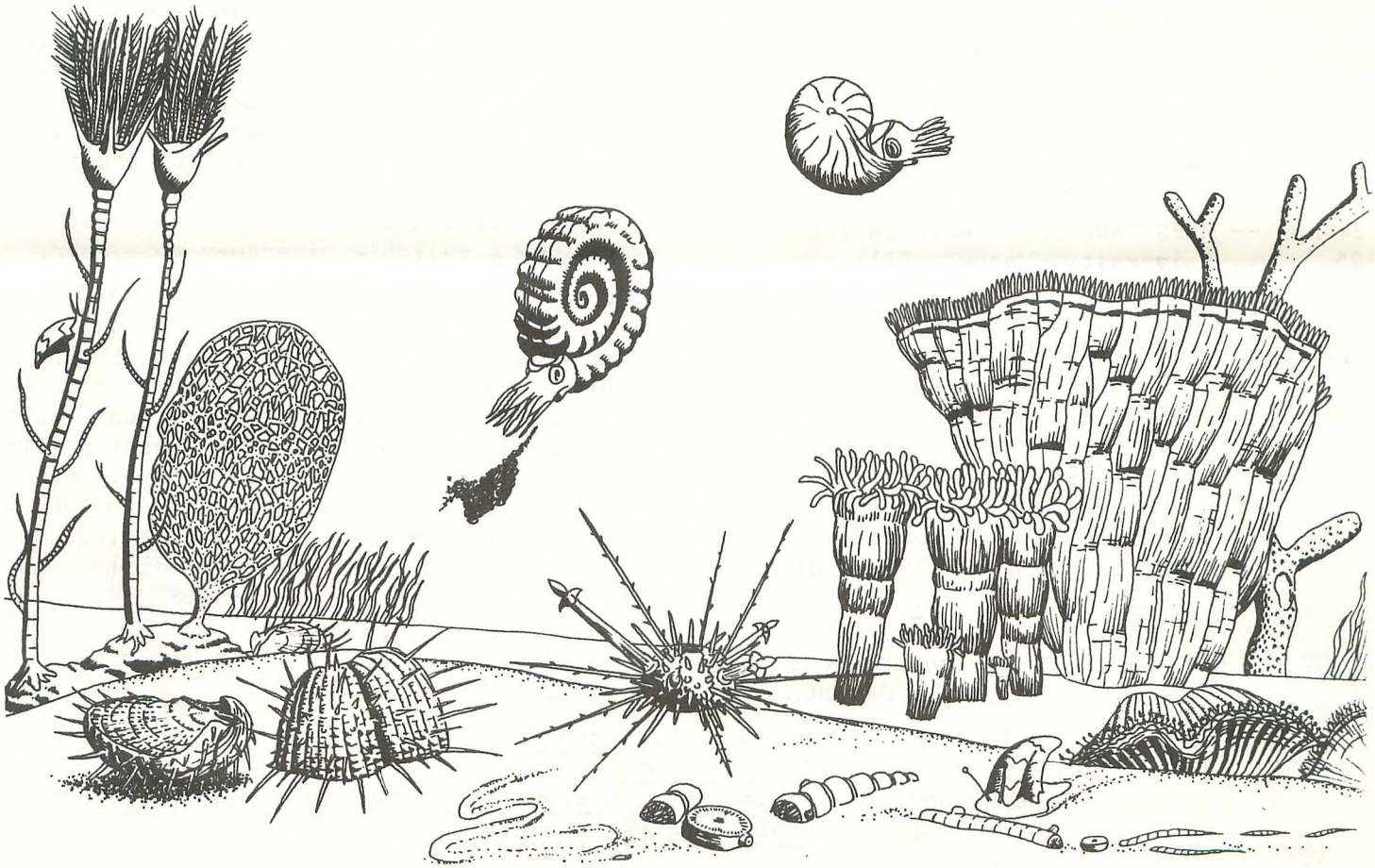

PENNSYLVANIAN INVERTRABATE SHALLOW WATER BIOTA-OKLAHOMA

A LOVE OF FOSSILS BRINGS US TOGETHER

MARK YOUR CALENDAR

7 Feb -- MAPS MEETING -- Monmouth College Geology Department, Monmouth IL
1:00 Board Meeting
2:00 MAPS Meeting -- Larry A. Wiedman, Paleoecologist, Implications, Southern Hemisphere Research--Anarctica and New Zealand.

Look forward to an interesting afternoon with Monmouth Geology students as hostand hostess.

14 Mar -- MAPS MEETING -- Home of Bob and Marge Cooper, 5012 Pfeiffer Road, Peoria, Illinois.
12:00 Board Meeting
1:00 MAPS Meeting -- The Cooper Marine Museum is a spectacular.

(ED comment--Please note the change of date--14 March.)

24 Apr -- MAPS EXPO IX -- Western Illinois
25 University, Macomb, Illinois
26

What's In Store? ECHINOIDS
Dr. Frank Holmes, Victoria, Australia
Frederick Collier, Dept of Paleobiology, Smithsonian Institution
Dr. Donald Mikulic, Illinois
Fossils -- Super Displays
Special EXPO EDITION IX Digest
YOU!

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HOW YOU CAN HELP!!

DUES ARE DUE -- $10.00
Make checks payable to MAPS
Mail to: Marv Houg, Treasurer
3330 44th St. N.E.
Cedar Rapids, IA 52404

NEW MEMBERSHIP DIRECTORY -- We intended to print a new Directory every other year. Because last year's directory had so many errors, a new Directory this year. Send any changes or new information to:
Mrs. Alberta Cray
1125 J Avenue, N.W.
Cedar Rapids, IA 52405

This is a big job. Alberta has to organize and set-up. Then the Computer Man has to up-date. And the Printer has to have the information to get it ready for EXPO. Please don't wait. It only takes a few minutes to up-date your information and pop it into an envelop addressed to Alberta. Let's have a reliable Directory this year.

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New MAPS Member Bill Scheunemann, PO Box 670744, Chugiak, AK 99567--The Chugach Gem and Mineral Society in co-operation with the Anchorage Devonian Society has just printed a book-GUIDE BOOK FOR ROCKHOUNDS....The publication is very professionally done and uses topographical maps to list collecting sites. Cost$9.95. Mail to: Chugach Gem and Mineral Box 92027, Anchorage, AK 99509

ABOUT THE COVER -- A Pennsylvanian seascape drawn from fossils collected in Osage County, N.E. Oklahoma. Fossils include:

Crinoid -- Plaxocrinus praevalens
Bryozoans -- Pennisetepora
Cephalopods -- Schistoceras missouriensis, Gastrioceras hyattianum
Brachiopods -- Echinoconchus, Neospirifer
Chonetes granulifes,
Gastropods -- Platyceras sp.
Echinoid -- Echinocrinus sp.
Corals -- Lophophyllidium proliferum, Lithostrolion

MAPS Member Mark McKinzie, 3535 N. St. Charles, #89, Oklahoma City, Oklahoma 73122, is responsible for the beautiful art work. Mark;s covers just pop up in the mail. This one has been on file for some time. Mark also did some illustrations for the TRILOBITE issue of the Digest. Mark has not been to an EXPO, but if you attended Fossilmania, 1986, perhaps you have met. Many thanks, Mark.

WHAT'S IN A NAME

By Bill Taylor
5266 Grafton Rd., #6B
Brunswick, Ohio 44212

When you name your dog Ralph, it's a pretty safe bet that he's going to stay Ralph, which is a comforting thought. In the world of fossil collecting, though, there is little such comfort. It sometimes seems as though an automatic trigger mechanism is in place. As soon as a certain percentage of Fossilites learn how to pronounce Thingamajigensis santa-clausi, the name will be automatically changed to Sthenerowhatchamacallitus gotchaagainha-haha.

Seriously though, none of us want Palaeontology to remain static. As new discoveries are gleaned from the earth's crust, and new interpretations of existing material are formulated, it's unavoidable that professional thinking will change. Seldom, however, are such re-evaluations more than tremors in the bedrock of our hobby. In 1973, though, Dr. J. Bergstrom of the University of Oslo, Norway, unleashed an earthquake on the Palaeontological world with the release of his total rethink of Class Trilobita, which threatens to throw our beloved Part O on the scrap heap. His proposed taxonomic changes are primarily a thorough shifting around of existing genera, subfamilies, families, and orders, with very few new taxa included. For example, he has moved Family Cheiruridae (Ceraurus, Cheirurus, etc.) from Order Phacopida to Order Odontopleurida, which makes sense to my amateurish eye.

What follows on the next several pages is a comparison of the two taxonomic systems, Bergstrom and Part O of the Treatise. Here's an example of how I've put it together:

Repres. Genus	Subfamily	Family Bergstrom / Treatise	Superfamily B. / T.	SO B. / T.	Order B. / T.	Age Span
Crepicephalus	NONE	Crepicephalidae / Crepicephalidae	8/12	13/12	9/8	1

The tables are arranged alphabetically by Family. In this example, a representative Genus is Crepicephalus, and no Subfamily is involved. Bergstrom and the Treatise agree that Crepicephalidae is the correct family. Beginning with Superfamily, I have used a system of Keys, which are listed on the first page of the report itself. For this example:

Superfamily (Bergstrom): Key #8-- Ceratopygacea
" (Treatise) : Key #12-- Crepicephalacea
Suborder (Bergstrom): Key #13-- Redlichiina
" (Treatise) : Key#12-- Ptychopariina
Order (Bergstrom): Key#9-- Redlichiida
" (Treatise) : Key#8-- Ptychopariida
Age Span (Of the relevant Subfamily or Family) : Key #1-- Cambrian

Several basic principles seem to hold true when comparing the two systems. Bergstrom has made extensive use of Superfamilies, where the Treatise tends toward Suborders. Bergstrom's Trinucleacea would be roughly equal to the Treatise's Trinucleina, for instance. Secondly, Bergstrom has done a great deal of up and down grading of taxonomic levels (Genus to Subfamily, Family to Subfamily, etc.) The major examples of this would be his elevating the Treatise's Suborders Illaenina and Olenellina to full ordinal status.

Finally, I'd like to note that the fairly large number of UNKNOWNs listed for the Treatise are almost totally items which have come forth subsequent to Part O's release in 1959.

P.S.: Definition of masochism: I did this without a computer. Anybody out there interested in about 8 million slightly used index cards?

KEY	SUPERFAMILY
1	Agnostacea
2	Anomocaracea
3	Asaphacea
4	Asaphiscacea
5	Bathyuracea
6	Burlingiacea
7	Calymenacea
8	Ceratopygacea
9	Cheiruracea
10	Conocoryphacea
11	Corynexochacea
12	Crepicephalacea
13	Cyclopygacea
14	Dalmanitacea
15	Damesellacea
16	Dikelocephalacea
17	Edelsteinaspidacea
18	Ellipsocephalacea
19	Emmrichellacea
20	Eodiscacea
21	Holotrachelacea
22	Illaenacea
23	Illaenuracea
24	Komaspidacea
25	Leiostegiacea
26	Lichacea
27	Marjumiacea
28	Nepeacea
29	Norwoodiacea
30	Odontopleuracea
31	Olenacea
32	Olenellacea
33	Paradoxidacea
34	Phacopacea
35	Proetacea
36	Ptychaspidacea
37	Ptychopariacea
38	Raymondinacea
39	Redlichiacea
40	Remopleuridacea
41	Solenopleuracea
42	Trinucleacea

KEY	SUBORDER
1	Agnostina
2	Asaphina
3	Bathynotina
4	Calymenina
5	Cheirurina
6	Corynexochina
7	Eodiscina
8	Harpina
9	Illaenina
10	Olenellina
11	Phacopina
12	Ptychopariina
13	Redlichiina
14	Trinucleina

KEY	ORDER
1	Agnostida
2	Corynexochida
3	Illaenida
4	Lichida
5	Odontopleurida
6	Olenellida
7	Phacopida
8	Ptychopariida
9	Redlichiida

KEY	AGE
1	Cambrian
2	Ordovician
3	Silurian
4	Devonian
5	Mississippian
6	Pennsylvanian
7	Permian

REFERENCES

Johnson, T.J., Trilobites, 1985

Levi-Setti, R., Trilobites, University of Chicago Press, 1975

Moore, R. (Ed.), Treatise on Intevertebrate Palaeontology, University of Kansas Press, and Geological Society of America, 1959

Repres. Genus	Subfamily	Family Bergstrom / Treatise	Superfamily B. / T.	SO B. / T.	Order B. / T.	Age Span
Agnostus	Agnostinae	Agnostidae / Agnostidae	1 / -	- / 1	1 / 1	1-2
Ptychagnostus	Ptychagnostinae	" / "	1 / -	- / 1	1 / 1	1
Quadragnostus	Quadragnostinae	" / Spinagnostidae	1 / -	- / 1	1 / 1	1
Aldonaia	NONE	Aldonaiidae / Protolenidae	39 / 18	13 / 13	9 / 9	1
Seleneceme	NONE	Alsataspididae / Alsataspididae	42 / -	- / 14	8 / 8	2
Agaso	NONE	Andrarinidae / Andrarinidae	3 / 16	2 / 12	9 / 8	1
Jenkinsonia	NONE	UNKNOWN / Annamitidae	? / 37	? / 12	? / 8	1
Glyphaspis	Anomocarinae	Anomocaridae / Anomocaridae	3 / 2	2 / 12	9 / 8	1
Lobocephalina	Conokephalininae	" / Ptychopariidae	3 / 37	2 / 12	9 / 8	1
Aulacoparia	Asaphinae	Asaphidae / Asaphidae	3 / 3	2 / 2	9 / 8	2
UNKNOWN	Griphasaphinae	" / UNKNOWN	3 / ?	2 / ?	9 / ?	?
Homotelus	Isotelinae	" / Asaphidae	3 / 3	2 / 2	9 / 8	2
Niobe	Niobinae	" / "	3 / 3	2 / 2	9 / 8	1-2
Ogygiocarella	Ogygiocaridinae	" / "	3 / 3	2 / 2	9 / 8	2
Borogothus	Promegalaspidinae	" / "	3 / 3	2 / 2	9 / 8	1-2
Symphysurina	Symphysurininae	" / "	3 / 3	2 / 2	9 / 8	2
Asaphellina	Taihungshaniinae	" / Taihungshaniidae	3 / 3	2 / 2	9 / 8	2
Australopyge	Thysanopyginae	" / Asaphidae	3 / 3	2 / 2	9 / 8	2
Asaphiscus	Asaphiscinae	Asaphiscidae / Asaphiscidae	8 / 4	13 / 12	9 / 8	1
Blountia	Blountiinae	" / "	8 / 4	13 / 12	9 / 8	1
UNKNOWN	NONE	Aulacodigmatidae / UNKNOWN	41 / ?	- / ?	8 / ?	?
Aulacopleura	Aulacopleurinae	Aulacopleuridae / Aulacopleuridae	41 / 35	- / 9	8 / 8	2-4
Cyphaspis	Cyphaspidinae	" / Otarionidae	41 / 35	- / 9	8 / 8	3
Otarion	Otarioninae	" / "	41 / 35	- / 9	8 / 8	2-4
UNKNOWN	NONE	Auritamidae / UNKNOWN	8 / ?	13 / ?	9 / ?	?
Bathynotus	NONE	Bathynotidae / Bathynotidae	39 / -	13 / 3	9 / 9	1
Bathyurus	NONE	Bathyuridae / Bathyuridae	35 / 5	- / 9	3 / 8	2
Bohemilla	NONE	Bohemillidae / Not Trilobite	40 / -	2 / -	9 / -	2
Bolaspis	NONE	Bolaspididae / Bolaspididae	41 / 29	- / 12	8 / 8	1
Cordania	NONE	Brachymetopidae / Brachymetopidae	35 / 35	- / 9	3 / 8	4-6
Burlingia	NONE	Burlingiidae / Burlingiidae	39 / 6	13 / 12	9 / 8	1
Acaste	Acastinae	Calmoniidae / Calmoniidae	34 / 14	- / 11	7 / 7	2-4
Metacryphaeus	Calmoniinae	" / "	34 / 14	- / 11	7 / 7	2-4
Flexicalymene	NONE	Calymenidae / Calymenidae	7 / -	- / 4	8 / 7	2-4
Carmon	NONE	Carmonidae / Incertae sedis	9 / ?	- / ?	5 / ?	2
Theodenisia	NONE	Catillicephalidae / Catillicephalidae	35 / 41	- / 12	3 / 8	1
Celmus	NONE	Celmidae / Celmidae	9 / 35	- / 9	5 / 8	2
Ceratopyge	NONE	Ceratopygidae / Ceratopygidae	8 / 8	13 / 2	9 / 8	1-2
Dorypygella	NONE	Chanshaniidae / Chanshaniinae / Emmrichellidae	8 / 19	13 / 12	9 / 8	1
Holia	Acanthoparyphinae	Cheiruridae / Cheiruridae	9 / -	- / 5	5 / 7	2
Ceraurus	Cheirurinae	" / "	9 / -	- / 5	5 / 7	2-4
Sphaerocoryphe	Deiphoninae	" / "	9/ -	- / 5	5 / 7	2-3

Repres. Genus	Subfamily	Family Bergstrom / Treatise	Superfamily B. / T.	SO B. / T.	Order B. / T.	Age Span
Eccoptochile	Eccoptochilinae	Cheiruridae / Cheiruridae	9 / -	- / 5	5 / 7	2
Pilekia	Pilekiinae	" / Pliomeridae	9 / -	- / 5	5 / 7	2
Sphaerexochus	Sphaerexochinae	" / Cheiruridae	9 / -	- / 5	5 / 7	2-3
Aspidagnostus	Aspidagnostinae	Clavagnostidae / Agnostidae	1 / -	- / 1	1 / 1	1
Clavagnostus	Clavagnostinae	" / Clavagnostidae	1 / -	- / 1	1 / 1	1
Mallagnostus	NONE	Condylopygidae / Condylopygidae	1 / -	- / 1	1 / 1	1
Conocoryphe	Conocoryphinae	Conocoryphidae / Conocoryphidae	41 / 10	- / 12	8 / 8	1-2
Periommella	Periommellinae	" / Ptychopariidae	41 / 37	- / 12	8 / 8	1
Pharostoma	Pharostomatinae	" / Calymenidae	41 / 7	- / 4	8 / 7	2
Bonnaspis	NONE	Corynexochidae / Corynexochidae	11 / -	- / 6	2 / 2	1
Crepicephalus	NONE	Crepicephalidae / Crepicephalidae	8 / 12	13 / 12	9 / 8	1
Microparia	NONE	Cyclopygidae / Cyclopygidae	22 / 13	- / 2	3 / 8	2
Callavia	Callaviinae	Daguinaspididae / Olenellidae	32 / -	- / 10	6 / 9	1
Daguinaspis	Daguinaspidinae	" / Daguinaspididae	32 / -	- / 10	6 / 9	1
Fallotaspis	Fallotaspidinae	" / Olenellidae	32 / -	- / 10	6 / 9	1
Neltneria	Neltneriinae	" / "	32 / -	- / 10	6 / 9	1
Nevadia	Nevadiinae	" / "	32 / -	- / 10	6 / 9	1
Greenops	Dalmanitinae	Dalmanitidae / Dalmanitidae	34 / 14	- / 11	7 / 7	3-4
Ormathops	Zeliszkellinae	" / "	34 / 14	- / 11	7 / 7	2
Damesella	NONE	Damesellidae / Damesellidae	8 / 15	13 / 12	9 / 8	1
Despujolsia	Despujolsiinae	Despujolsiidae / Despujolsiidae	39 / 39	13 / 13	9 / 9	1
Resserops	Resseropinae	" / Neoredlichiidae	39 / 39	13 / 13	9 / 9	1
Briscoia	Dikelocephalinae	Dikelocephalidae / Dikelocephalidae	3 / 16	2 / 12	9 / 8	1
Tellerina	Saukiinae	" / Saukiidae	3 / 36	2 / 12	9 / 8	1
Asaphopsis	NONE	Dikelocephalinidae / Dikelocephalinidae	3 / 3	2 / 2	9 / 8	2
Tollaspis	NONE	Dinesidae / Dinesidae	11 / -	- / 6	2 / 2	1
Dionide	NONE	Dionididae / Dionididae	42 / -	- / 14	8 / 8	2
UNKNOWN	Ammagnostinae	Diplagnostidae / UNKNOWN	1 / ?	- / ?	1 / ?	?
Diplagnostus	Diplagnostinae	" / Diplagnostidae	1 / -	- / 1	1 / 1	1
Glyptagnostus	Glyptagnostinae	" / Hastagnostidae	1 / -	- / 1	1 / 1	1
Oidalagnostus	Oidalagnostinae	" / Diplagnostidae	1 / -	- / 1	1 / 1	1
Pseudagnostus	Pseudagnostinae	" / "	1 / -	- / 1	1 / 1	1
Tomagnostus	Tomagnostinae	" / "	1 / -	- / 1	1 / 1	1
UNKNOWN	NONE	Discagnostidae / UNKNOWN	1 / ?	- / ?	1 / ?	?
Dolerolenus	NONE	Dolerolenidae / Dolerolenidae	39 / 39	13 / 13	9 / 9	1
Bathyuriscus	NONE	Dolichometopidae / Dolichometopidae	11 / -	- / 6	2 / 2	1
Olenoides	NONE	Dorypygidae / Dorypygidae	11 / -	- / 6	2 / 2	1
Edelsteinaspis	Edelsteinaspidinae	Edelsteinaspididae / Incertae sedis	17 / ?	- / ?	7 / ?	1
UNKNOWN	Laticephalinae	" / UNKNOWN	17 / ?	- / ?	7 / ?	?
UNKNOWN	Nodicephinae	" / UNKNOWN	17 / ?	- / ?	7 / ?	?
Agraulos	Agraulinae	Ellipsocephalidae / Agraulidae	41 / 41	- / 12	8 / 8	1
Antatlasia	Antatlasiinae	" / Ellipsocephalidae	41 / 18	- / 13	8 / 9	1

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Ellipsocephalus	Ellipsocephalinae	Ellipsocephalidae / Ellipsocephalidae	41 / 18	- / 13	8 / 9	1
Kingaspis	Kingaspidinae	" / "	41 / 18	- / 13	8 / 9	1
Strenuella	Strenuellinae	" / "	41 / 18	- / 13	8 / 9	1
UNKNOWN	NONE	Emuellidae / UNKNOWN	39 / ?	13 / ?	9 / ?	?
Bevanopsis	Cybelinae	Encrinuridae / Encrinuridae	9 / -	- / 5	5 / 7	2
Plasiaspis	Dindymeninae	" / "	9 / -	- / 5	5 / 7	2
Encrinurus	Encrinurinae	" / "	9 / -	- / 5	5 / 7	2-3
Staurocephalus	Staurocephalinae	" / "	9 / -	- / 5	5 / 7	2-3
Salteria	NONE	Endymioniidae / Endymioniidae	42 / -	- / 14	8 / 8	2
Entomaspis	NONE	Entomaspididae / Entomaspididae	41 / -	- / 8	8 / 8	1-2
Acidaspides	NONE	Eoacidaspididae / Eoacidaspididae	30 / -	- / -	5 / 5	1
Eodiscus	NONE	Eodiscidae / Eodiscidae	20 / -	- / 7	1 / 1	1
UNKNOWN	NONE	Erixaniidae / UNKNOWN	8 / ?	13 / ?	9 / ?	?
UNKNOWN	NONE	Eulomatidae / UNKNOWN	41 / ?	- / ?	8 / ?	?
Eurekia	NONE	Eurekiidae / Eurekiidae	35 / 36	- / 12	3 / 8	1
Gigantopygus	NONE	Gigantopygidae / Gigantopygidae	39 / 39	13 / 13	9 / 9	1
Glaphurus	NONE	Glaphuridae / Glaphuridae	30 / 24	- / 12	5 / 8	2
UNKNOWN	NONE	Granulariidae / Incertae sedis	11 / ?	- / ?	2 / ?	?
UNKNOWN	NONE	Hammatocnemidae / UNKNOWN	9 / ?	- / ?	5 / ?	?
Hapalopleura	NONE	Hapalopleuridae / Hapalopleuridae	42 / -	- / 14	8 / 8	2
Dolichoharpes	NONE	Harpidae / Harpidae	41 / -	- / 8	8 / 8	2-4
Loganopeltis	NONE	Harpididae / Harpididae	8 / -	13 / 8	9 / 8	1-2
Hicksia	NONE	Hicksiidae / Hicksiidae	11 / 33	- / 13	2 / 9	1
Holmia	NONE	Holmiidae / Olenellidae	32 / -	- / 10	6 / 9	1
Holotrachelacea	NONE	Holotrachelidae / Holotrachelidae	35 / 21	- / 9	3 / 8	2
Bavarilla	Bavarillinae	Homalonotidae / Homalonotidae	7 / -	- / 4	8 / 7	2
Colpocoryphe	Colpocoryphinae	" / "	7 / -	- / 4	8 / 7	2
Synhomalonotus	Eohomalonotinae	" / "	7 / -	- / 4	8 / 7	2
Dipleura	Homalonotinae	" / "	7 / -	- / 4	8 / 7	3-4
UNKNOWN	Portagininae	" / UNKNOWN	7 / ?	- / ?	8 / ?	?
Hungaia	NONE	Hungaiidae / Hungaiidae	40 / 40	2 / 12	9 / 8	1
Hypermecaspis	NONE	Hypermecaspididae / Hypermecaspididae	31 / 31	2 / 12	9 / 8	2
Wilbernia	NONE	Idahoiidae / Idahoiidae	3 / 16	2 / 12	9 / 8	1
Bumastus	Bumastinae	Illaenidae / Illaenidae	22 / 22	- / 9	3 / 8	2-3
Ectillaenus	Ectillaeninae	" / "	22 / 22	- / 9	3 / 8	2
Illaenus	Illaeninae	" / "	22 / 22	- / 9	3 / 8	2-3
Panderia	Panderiinae	" / "	22 / 22	- / 9	3 / 8	2
Illaenurus	NONE	Illaenuridae / Illaenuridae	35 / 23	- / 12	3 / 8	1
UNKNOWN	NONE	Jakutiidae / UNKNOWN	39 / ?	13 / ?	9 / ?	?
Kaolishania	Kaolishaniinae	Kaolishaniidae / Kaolishaniidae	8 / 15	13 / 12	9 / 8	1
Mansuyia	Mansuyiinae	" / "	8 / 15	13 / 12	9 / 8	1
Tingocephalus	Tingocephalinae	" / Incertae sedis	8 / ?	13 / ?	9 / ?	1
Brachyaspidion	NONE	Kingstoniidae / Kingstoniidae	35 / 41	- / 12	3 / 8	1

Repres. Genus	Subfamily	Family Bergstrom	/ Treatise	Superfamily B. / T.	SO B. / T.	Order B. / T.	Age Span
Resseraspis	NONE	Lecanopygidae	/ Lecanopygidae	35 / 5	- / 9	3 / 8	1-2
Lloydia	Leiostegiinae	Leiostegiidae	/ Leiostegiidae	35 / 25	- / 12	3 / 8	1-2
Pagodia	Pagodiinae	"	/ Pagodiidae	35 / 27	- / 12	3 / 8	1-2
Lichakephalus	NONE	Lichakephalidae	/ Lichakephalidae	26 / -	- / -	4 / 4	2
Hemiarges	Ceratarginae	Lichidae	/ Lichidae	26 / -	- / -	4 / 4	2-4
Platylichas	Homolichinae	"	/ "	26 / -	- / -	4 / 4	2-3
Terataspis	Lichinae	"	/ "	26 / -	- / -	4 / 4	2-4
Amphilichas	Tetralichinae	"	/ "	26 / -	- / -	4 / 4	2
UNKNOWN	Dorematapidinae	Liostracinidae	/ UNKNOWN	8 / ?	13 / ?	9 / ?	?
Liostracina	Liostracininae	"	/ Liostracinidae	8 / 19	13 / 12	9 / 8	1
Loganellus	NONE	Loganellidae	/ Loganellidae	3 / 40	2 / 12	9 / 8	1
Mapania	NONE	Mapaniidae	/ Anomocaridae	8 / 2	13 / 12	9 / 8	1
Modocia	NONE	Marjumiidae	/ Marjumiidae	8 / 27	13 / 12	9 / 8	1
UNKNOWN	NONE	Mayiellidae	/ UNKNOWN	39 / ?	13 / ?	9 / ?	?
Bolaspidella	NONE	Menomoniidae	/ Menomoniidae	41 / 29	- / 12	8 / 8	1
Catadoxides	NONE	Metadoxididae	/ Paradoxididae	39 / 33	13 / 13	9 / 9	1
Elasmaspis	NONE	Monorakidae	/ Monorakidae	34 / 14	- / 11	7 / 7	2
Myinda	NONE	Myindidae	/ Incertae sedis	42 / ?	- / ?	8 / ?	2
Nepea	NONE	Nepeidae	/ Nepeidae	41 / 28	- / 12	8 / 8	1
Nileus	NONE	Nileidae	/ Nileidae	3 / 3	2 / 2	9 / 8	2
Apianurus	Apianurinae	Odontopleuridae	/ Odontopleuridae	30 / -	- / -	5 / 5	2
Dicranurus	Miraspidinae	"	/ "	30 / -	- / -	5 / 5	2-4
Leonaspis	Odontopleurinae	"	/ "	30 / -	- / -	5 / 5	2-4
Selenopeltis	Selenopeltinae	"	/ "	30 / -	- / -	5 / 5	2
Ogygopsis	NONE	Ogygopsidae	/ Ogygopsidae	11 / -	- / 6	2 / 2	1
Paedumias	NONE	Olenellidae	/ Olenellidae	32 / -	- / 10	6 / 9	1
Eurycare	Leptoplastinae	Olenidae	/ Olenidae	31 / 31	2 / 12	9 / 8	1-2
Olenus	Oleninae	"	/ "	31 / 31	2 / 12	9 / 8	1-2
Westergaardia	Pelturinae	"	/ "	31 / 31	2 / 12	9 / 8	1-2
Rhodonaspis	Rhodonaspidinae	"	/ Papyriaspididae	31 / 31	2 / 12	9 / 8	1
UNKNOWN	Talbotinellinae	"	/ UNKNOWN	31 / ?	2 / ?	9 / ?	?
Triarthrus	Triarthrinae	"	/ Olenidae	31 / 31	2 / 12	9 / 8	1-2
Orometopus	NONE	Orometopidae	/ Orometopidae	42 / -	- / 14	8 / 8	2
Cheiruroides	Cheiruroidinae	Oryctocephalidae	/ Oryctocephalidae	11 / -	- / 6	2 / 2	1
Lancastria	Lancastriinae	"	/ "	11 / -	- / 6	2 / 2	1
Oryctocara	Oryctocarinae	"	/ "	11 / -	- / 6	2 / 2	1
Oryctocephalops	Oryctocephalinae	"	/ "	11 / -	- / 6	2 / 2	1
Tonkinella	Tonkinellinae	"	/ "	11 / -	- / 6	2 / 2	1
Pagetia	NONE	Pagetiidae	/ Pagetiidae	20 / -	- / 7	1 / 1	1
Papyriaspis	NONE	Papyriaspididae	/ Papyriaspididae	8 / 31	13 / 12	9 / 8	1
Croixana	NONE	Parabolinoididae	/ Parabolinoididae	3 / 23	2 / 12	9 / 8	1
Centropleura	Centropleurinae	Paradoxididae	/ Paradoxididae	39 / 33	13 / 13	9 / 9	1
Paradoxides	Paradoxidinae	"	/ "	39 / 33	13 / 13	9 / 9	1
Xystridura	Xystridurinae	"	/ "	39 / 33	13 / 13	9 / 9	1

Repres. Genus	Subfamily	Family Bergstrom	/ Treatise	Superfamily B. / T.	SO B. / T.	Order B. / T.	Age Span
UNKNOWN	Andreaspidinae	Phacopidae	/ UNKNOWN	34 / ?	- / ?	7 / ?	?
Bouleia	Bouleiinae	"	/ Phacopiidae	34 / 34	- / 11	7 / 7	4
Denckmannites	Phacopidellinae	"	/ "	34 / 34	- / 11	7 / 7	3-4
Reedops , Phacops	Phacopinae	"	/ "	34 / 34	- / 11	7 / 7	3-4
Phalacroma	NONE	Phalacromidae	/ Phalacromidae	1 / -	- / 1	1 / 1	1
Phillipsinella	NONE	Phillipsinellidae	/ Phillipsinellidae	41 / 35	- / 9	8 / 8	2
UNKNOWN	NONE	Plectriferidae	/ UNKNOWN	8 / ?	13 / ?	9 / ?	?
Plethopeltis	NONE	Plethopeltidae	/ Plethopeltidae	41 / 35	- / 9	8 / 8	1-2
Diaphanometopus	Diaphanometopinae	Pliomeridae	/ Pliomeridae	9 / -	- / 5	5 / 7	2
Placoparia	Placopariinae	"	/ "	9 / -	- / 5	5 / 7	2
Pliomerella	Pliomerellinae	"	/ "	9 / -	- / 5	5 / 7	2
Cybelopsis	Pliomerinae	"	/ "	9 / -	- / 5	5 / 7	2
UNKNOWN	NONE	Polycyrtaspididae	/ UNKNOWN	8 / ?	13 / ?	9 / ?	?
Cornuproetus	Cornuproetinae	Proetidae	/ Proetidae	35 / 35	- / 9	3 / 8	2-4
Cyrtosymbole (sp ?)	Cyrtocymbolinae	"	/ "	35 / 35	- / 9	3 / 8	4-5
Breviphillipsia	Griffithidinae	"	/ Phillipsiidae	35 / 35	- / 9	3 / 8	5-7
Proetus	Proetinae	"	/ Proetidae	35 / 35	- / 9	3 / 8	2-4
Bergeroniellus	Bergeroniellinae	Protolenidae	/ Protolenidae	39 / 18	13 / 13	9 / 9	1
Bigotina	Bigotininae	"	/ "	39 / 18	13 / 13	9 / 9	1
Lermontovia	Lermontoviinae	"	/ "	39 / 18	13 / 13	9 / 9	1
Myopsolenus	Myopsoleninae	"	/ "	39 / 18	13 / 13	9 / 9	1
Palaeolenus	Palaeoleninae	"	/ Ellipsocephalidae	39 / 18	13 / 13	9 / 9	1
Protolenus	Protoleninae	"	/ Protolenidae	39 / 18	13 / 13	9 / 9	1
Termierella	Termierellinae	"	/ "	39 / 18	13 / 13	9 / 9	1
Chasmops	Chasmopinae	Pterygometopidae	/ Pterygometopidae	34 / 14	- / 11	7 / 7	2
Calyptaulax	Pterygometopinae	"	/ "	34 / 14	- / 11	7 / 7	2
Conaspis	NONE	Ptychaspididae	/ Ptychaspididae	35 / 36	- / 12	3 / 8	1
Crassifimbra	Antagminae	Ptychopariidae	/ Ptychopariidae	41 / 37	- / 12	8 / 8	1
Brunswickia	Nassoviinae	"	/ "	41 / 37	- / 12	8 / 8	1
Ptychoparia	Ptychopariinae	"	/ "	41 / 37	- / 12	8 / 8	1
UNKNOWN	Ampyxellinae	Raphiophoridae	/ UNKNOWN	42 / ?	- / ?	8 / ?	?
Ampyxina	Ampyxininae	"	/ Raphiophoridae	42 / -	- / 14	8 / 8	2
UNKNOWN	Bulbaspidinae	"	/ UNKNOWN	42 / ?	- / ?	8 / ?	?
Raphiophorus	Raphiophorinae	"	/ Raphiophoridae	42 / -	- / 14	8 / 8	2-3
Brassicephalus	NONE	Raymondinidae	/ Raymondinidae	9 / 38	- / 12	5 / 8	1
Abadiella	Abadiellinae	Redlichiidae	/ Abadiellidae	39 / 39	13 / 13	9 / 9	1
Neoredlichia	Neoredlichiinae	"	/ Neoredlichiidae	39 / 39	13 / 13	9 / 9	1
Pararedlichia	Pararedlichiinae	"	/ Redlichiidae	39 / 39	13 / 13	9 / 9	1
Redlichia	Redlichiinae	"	/ "	39 / 39	13 / 13	9 / 9	1
Wutingaspis	Wutingaspidinae	"	/ Abadiellidae	39 / 39	13 / 13	9 / 9	1
Hypodicranotus	Remopleuridinae	Remopleuridiidae	/ Remopleuridiidae	40 / 40	2 / 12	9 / 8	2
Kainella	Richardsonellinae	"	/ "	40 / 40	2 / 12	9 / 8	1-2
UNKNOWN	NONE	Rhyssometopidae	/ UNKNOWN	8 / ?	13 / ?	9 / ?	?

Repres. Genus	Subfamily	Family Bergstrom / Treatise	Superfamily B. / T.	SO B. / T.	Order B. / T.	Age Span
Longianda	NONE	Saukiandidae / Saukiandidae	11 / 39	- / 13	2 / 9	1
Shumardia	NONE	Shumardiidae / Shumardiidae	35 / 10	- / 12	3 / 8	1-2
Cliffia	Acrocephalitinae	Solenopleuridae / Solenopleuridae	41 / 41	- / 12	8 / 8	1
Dimeropyge	Dimeropyginae	" / Dimeropygidae	41 / 35	- / 9	8 / 8	2
Hystricurus	Hystricurinae	" / Solenopleuridae	41 / 41	- / 12	8 / 8	1-2
Sao	Saoinae	" / "	41 / 41	- / 12	8 / 8	1
Spencia	Solenopleurinae	" / "	41 / 41	- / 12	8 / 8	1
Sphaeragnostus	NONE	Sphaeragnostidae / Sphaeragnostidae	1 / -	- / 1	1 / 1	2
Peronopsis	NONE	Spinagnostidae / Spinagnostidae	1 / -	- / 1	1 / 1	1
Telephina	NONE	Telephinidae / Telephinidae	9 / 24	- / 12	5 / 8	2
Goldillaenus	Goldillaeninae	Thysanopeltidae / Illaenidae	22 / 22	- / 9	3 / 8	3
Stygina	Styginainae	" / Styginidae	22 / 22	- / 9	3 / 8	2
Theamataspis	Theamataspidinae	" / Illaenidae	22 / 22	- / 9	3 / 8	2
Scutellum	Thysanopeltinae	" / Thysanopeltidae	22 / 22	- / 9	3 / 8	2-4
Tricrepicephalus	NONE	Tricrepicephalidae / Tricrepicephalidae	8 / 12	13 / 12	9 / 8	1
Trinodus	NONE	Trinodidae / Geragnostidae	1 / -	- / 1	1 / 1	2
Lloydolithus	Cryptolithinae	Trinucleidae / Trinucleidae	42 / -	- / 14	8 / 8	2
Incaia	Incaiinae	" / "	42 / -	- / 14	8 / 8	2
Novaspis	Novaspidinae	" / "	42 / -	- / 14	8 / 8	2
Tretaspis	Tretaspidinae	" / "	42 / -	- / 14	8 / 8	2
Trinucleus	Trinucleinae	" / "	42 / -	- / 14	8 / 8	2
Dictyites	NONE	Tsinaniidae / Tsinaniidae	8 / 3	13 / 2	9 / 8	1
UNKNOWN	Drepanopyginae	Yinitidae / UNKNOWN	39 / ?	13 / ?	9 / ?	?
Yinites	Yinitinae	" / Yinitidae	39 / 39	13 / 13	9 / 9	1
Albertella	NONE	Zacanthoididae / Zacanthoididae	11 / -	- / 6	2 / 2	1

WORM BURROWS IN MIDDLE DEVONIAN CORALS

Worm associations with corals have been documented by past paleontologist (i.e. Clarke, 1908). Oliver (1983) described the symbioses of Eridophyllum seriale (M-E&H), Breviphrentis sp., and Heliophyllum cf. H. halli M-E&H). I have been collecting burrowed corals from the Jeffersonville Limestone "coral zone" (Emsian) and Paraspirifer acuminatus Zone (Eifelian) for several years. Burrows occur either as inserts between the septae or subepithecal (just under the skin). A systematic search for burrowed corals has not been undertaken, however certain corals are frequently burrowed. The two most frequently burrowed corals are Zaphrenthis phrygia Rafinesque & Clifford and Heliophyllum venatum Hall. Other burrowed corals include: Heliophyllum verticale Hall, Heliophyllum (Asterobillingsa) yandelli (Rominger), and perhaps most peculiar, Alveolites winchellana (Miller) which is a ramose tabulate coral.

All species mentioned above, except H. yandelli are silicified, so detail within the burrow wall is lacking. Some worm tubes are separated from the coral by a calcareous filling, probably deposited by the coral polyp (rather than by the worm). Clarke named the tube Gitonia corallophia (with wall). Vermiforchnus (without calcareous exterior wall) was named by Cameron (1969).

This note is to call to the attention of fossil collectors the occurences of worm tubes in organisms not generally considered to be burrowed (unlike the bivalves). As a more systematic search for corals is carried out, other species will no doubt be found to contain worm tubes. All corals mentioned above belong to the collection of the writer, except the A. winchellana which was given to Dr. William A. Oliver, Jr. for inclusion in the U. S. National Museum's reference collection. Stromotoporoids have also been found to contain worm burrows.

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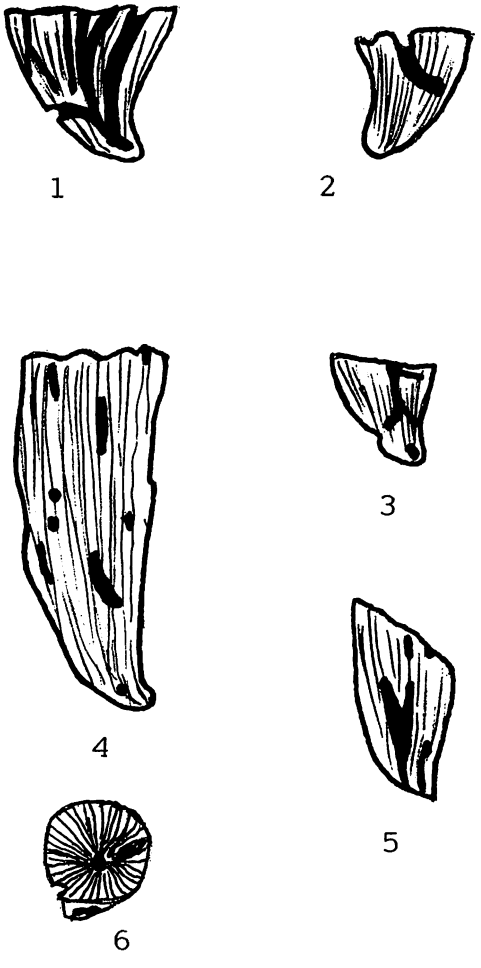

Figures 1 - 6, Zaphrenthis sp. with worm borings. 1. Heavily burrowed, 2. Single borrow, 4. Vertical burrows into coral, 6. Vertical burrow in center of calyx.

Cameron, B., 1969. Paleozoic shell-boring annelids and their trace fossils. Am. Zool. 9, 689-703.
Clarke, J.M., 1908. The beginnings of dependant life. Ann. Rep. N.Y. St. Mus. 61(1), 146-196.
Oliver, W.A., Jr., 1983. Symbioses of Devonian rugose corals. Mem. Assoc. Australasian Palaeontols 1, 261-274.

(Ed Comment -- Alan is now Curator of Science, Museum of History, E. Science, Louisville, KY 40202. Congratulations, Alan.)

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