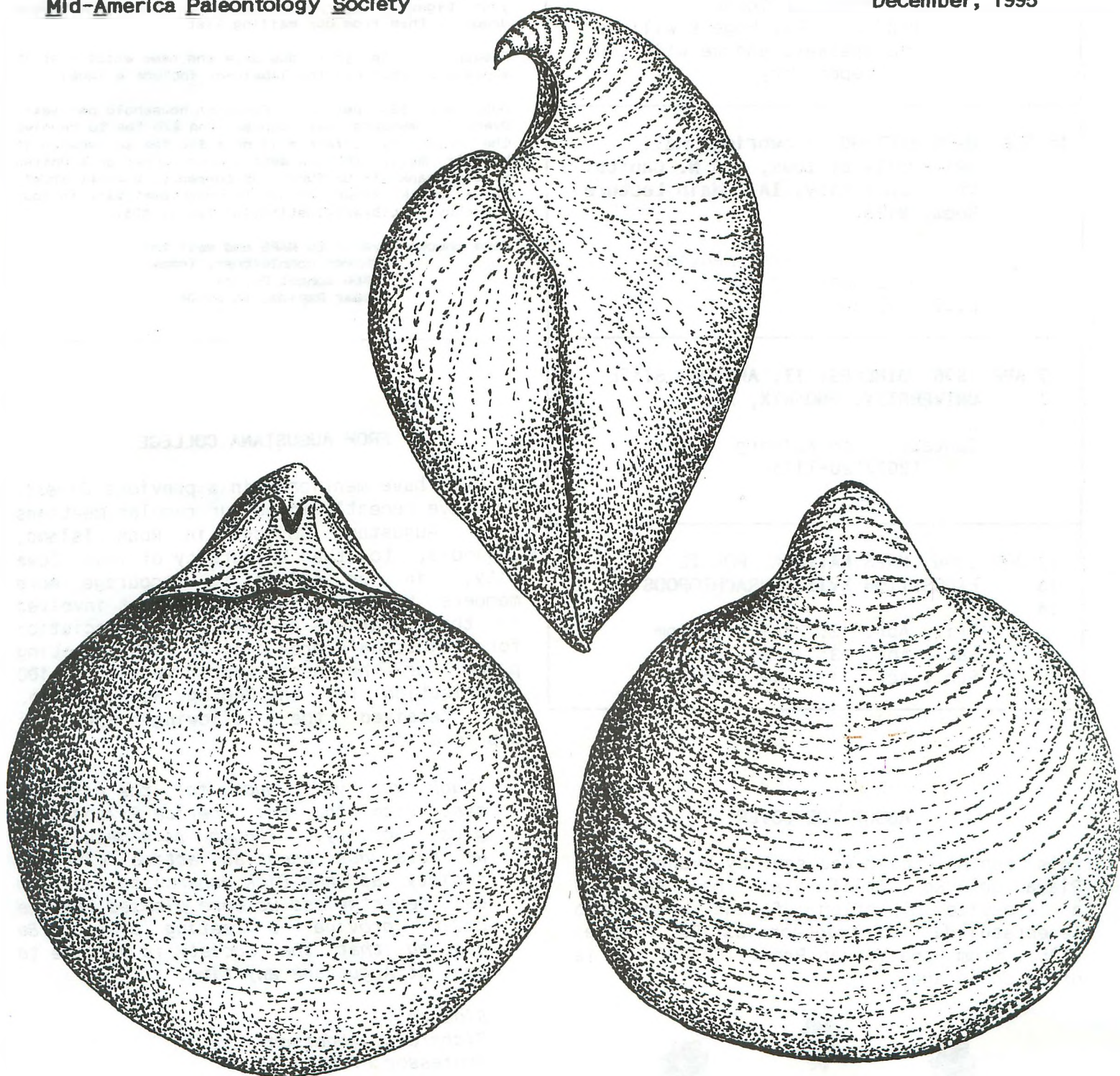


# M.A.P.S. *Digest*

Official Publication of  
Mid-America Paleontology Society

Volume 18 Number 9  
December, 1995



## MARK YOUR CALENDARS

**13 JAN MAPS MEETING.** Cornell College  
Geology Department, Mt. Vernon,  
Iowa.

1:00 Board & General Meeting  
combined.  
2:00 Program: Cornell  
Professor Ray Rogers will be  
the speaker, and we will tour  
the repository.

**10 FEB MAPS MEETING.** Trowbridge Hall,  
University of Iowa, 123 N. Capital  
St., Iowa City, IA. Main Lecture  
Room, #125.

1:00 Board & General Meeting  
combined.  
2:00 Program:

**7 APR 1996 DINOFEET II, ARIZONA STATE  
UNIVERSITY, PHOENIX, AZ.  
21**

Contact: Don Wolberg  
(202)720-7178

**12 APR 1996 MAPS NATIONAL FOSSIL  
EXPOSITION XVIII—BRACHIOPODS  
13  
14**

Fri., Apr. 12: 8am - 5:30pm  
Sat., Apr. 13: 8am - 5pm  
Sun., Apr. 14: 8am - 3pm

### ABOUT THE COVER

This month's cover was sent by Yvonne Albi, Playa del Rey, California. The drawing is a life-size depiction of the brachiopod Terebratulida *Stringocephalus* De France, 1825, from the Yunnan Prov., China. It is of Devonian age.

  
**HAPPY HOLIDAYS!**

### \*\*\* 95/12 DUES ARE DUE \*\*\*

Are your dues due? You can tell by checking your mailing label. The top line gives the expiration date in the form of year followed by month--95/12 means 1995/Dec. Dues cover the issue of the Digest for the month in which they expire.

We do not send notices but will let you know if you are overdue by highlighting your mailing label on your Digest. We carry overdues for two months before dropping them from our mailing list.

Please include your due date and name exactly as it appears on your mailing label--or include a label.

Dues are \$20 per U.S./Canadian household per year. Overseas members may choose the \$20 fee to receive the Digest by surface mail or a \$30 fee to receive it by air mail. (Please send a check drawn on a United States bank in US funds; US currency; a money order; or a check drawn on an International bank in your currency.) Library/Institution fee is \$25.

Make checks payable to MAPS and mail to:  
Sharon Sonneleitner, Treas.  
4800 Sunset Dr. SW  
Cedar Rapids, IA 52404

### FROM AUGUSTANA COLLEGE

As we have mentioned in a previous *Digest*, we have recently moved our regular meetings from Augustana College in Rock Island, Illinois, to the University of Iowa, Iowa City, in an effort to encourage more members to attend meetings and get involved in the operations of MAPS. In appreciation for Augustana's providing us with a meeting place for the past year, we sent a \$100 contribution for the Geology Museum there. We received the following note of appreciation:

*Thank you very much for the gift you sent from the Mid America Paleontological Society. Though as a department we have not been as active with the society as when Dick Johannesen was with us, nevertheless we were pleased that we could provide a meeting place. Be assured that the Society is welcome to meet at Augustana any time.*

Sincerely,  
Richard C. Anderson  
Professor of Geology

## EXPO PREPARATION IN FULL SWING

As we approach the end of 1995, those of us in MAPS look forward to the April and our 18th EXPO. Information on table reservations, rooms, etc., will come out in the January *Digest*. We do not take table reservations until then, but it is time to begin making your plans.

We will once again limit tables to 2 per family/membership, except for those with very special needs (such as the book dealer). This policy last year enabled us to accommodate just about everyone who wanted to come. It is not meant to restrict anyone. In Europe table space is sold by the meter rather than by table. Think about displaying samples of your material while storing extras under your table.

Maggie Kahrs is once again the EXPO *Digest* editor. If you can contribute an article on brachiopods (our theme for this year), be sure to contact her soon.

## VIDEOS AVAILABLE

A few years ago MAPS put together some video programs of several fossil groups, including brachiopods, crinoids, arthropods, fishes, and others. Each includes a study guide and can be ordered from Gil Norris (See order form on page 8.) Each program can be ordered on a separate tape, or more than one program (up to 2 hours worth) can be ordered on one tape.

We are also looking for a volunteer who would be willing to replace Gil as the contact person for the tapes. If you are interested, please contact Gil.

## ARTICLES WANTED

HELP! We want to keep the *Digest* fresh with new articles written by our members for our members. This can only happen if our members write and send their articles to the editor. Since we have such a wide variety of interests and experience levels, the subject matter is wide open. Make a New Year's Resolution to add your contribution to the *Digest*.

## PROPOSED CHANGES TO THE BY-LAWS

Because we have recently changed the duties of the 2nd Vice President and the times and place of the regular MAPS meetings, it is necessary to change the by-laws to reflect those changes. Allyn Adams proposed the following changes, which will be voted on at the January meeting:

Under Constitution article 4--Officers, section 1, change from:  
*The foregoing officers, together with three Directors to be elected and the Bulletin Editor, past President and EXPO. Chairman shall constitute the Executive Board.*

To: **The foregoing Officers, together with three Directors to be elected, the Bulletin Editor, past President, and the EXPO. Chairman shall constitute the Executive Board.**

Under By-laws Article 2--Duties of Officers, section 3, change from:  
*2nd Vice President--Organizes and plans field trips.*

To: **2nd Vice President--The past 2nd Vice President shall be EXPO Chairman and will be assisted by the current 2nd Vice President in the planning of the current year EXPO.**

Under By-laws Article 4--Committees, section 2, change from:  
*The field trip committee chaired by 2nd Vice President shall investigate collecting localities and plan field trips, make all arrangements with the necessary authorities, notify Society members of field trip plans, meeting places, schedules, routes and leaders. It shall also obtain club insurance coverage if necessary.*

To: **MAPS EXPO Committee chaired by the past 2nd Vice President and assisted by the current 2nd Vice President and any others appointed to assist him will make all arrangements for EXPO. Duties will include arranging dates for the next year's EXPO. A list will be given to him detailing all the arrangements that must be made.**

Under By-laws Article 5--Meetings, change from:  
*The regular monthly meeting of the Society will be held at 1:00 P.M. on the first Saturday of each month, except during June, July, August, and September.*

To: **The regular meetings of the Society will be held in the months of October, November, January, and March, and at EXPO in April. A summer meeting and picnic will also be held. All meeting dates and times will be held at a time and place to be determined by the Board of Directors.**

**WHAT IS TAPHONOMY**

by Jim Wyatt

from *The Fossil Record*, Oct 1995via *Paleo Newsletter*, Nov 1995

"It has been said that he who is a good preserver of his life  
 eats no tigers or wild buffaloes on land  
 is not vulnerable to weapons in the field of battle.  
 The horns of the wild buffalo are powerless against him;  
 The paws of the tiger are useless against him;  
 The weapons of the soldier cannot avail against him,  
 How is it so?  
 Because he is beyond death."  
 Laotse 571 B.C.

According to Laotse, fossils must be the best preservers of life, for they have endured the vagaries of time beyond death, yet tell us so much about ancient life! In the understanding of the process of fossilization, the paleontologist must go beyond death. He must examine the entombment and the eventual resurrection of a specimen in order to learn as much as possible about how the organism lived. This type of research is a branch of science known as taphonomy. A Russian paleontologist coined the word from the Greek words *taphos*, for "burial", and *nomos*, for "law". George Gaylord Simpson defines taphonomy as "everything that happens to a fossil from the death of the organism until the time when whatever remains of it is on a paleontologist's work table ready for study." Simpson further details the definition by saying that taphonomy consists of three stages of investigation: from death to burial, the vast time of entombment; and finally, its resurrection and preparation for study.

When I collect a specimen, it is the taphonomy that opens the mind and allows me to see the ancient environment from which it came. Suddenly the specimen is alive in an ecosystem long since forgotten! No longer is it a mere shell or bit of bone, but it has become an ammonite being devoured by a giant mosasaur! Was it a marine environment? What other clues exist to show this? Are there other organisms preserved for study? Does the ammonites shell show any indication of predation from a mosasaur? Do they match a mosasaur's tooth impression? Is the matrix consistent with marine deposition? How was the

specimen buried? Fossilized? Unearthed? Collected? Answers to these basic questions, along with many others, form the mass of data that the paleontologist looks for in trying to reconstruct the past.

It was Peter Dodson of the University of Pennsylvania who first applied taphonomy systematically to dinosaurs. In Canada's Dinosaur Provincial Park, he made the first efforts to unravel not only what dinosaurs had lived in the park, but to understand how they interacted with the environment. To detail an environment never before seen, he analyzed the fossils, ancient stream channels, growth rings of petrified wood and position of bones. He surmised that, seventy-six million years ago, the park was like a southern bayou. Its inhabitants were small mammals, turtles, crocodiles, duckbilled dinosaurs and horned centrosaurs. The area was a flatland, cut through with small streams and dotted with trees and abundant marsh grasses. Silt and mud washed down from the mountains during floods and settled on the deltas. In the process, many animals were entombed in stream flood deposits. Dodson was able to discern that water transported the dinosaurs in the park to their final resting place. He was further able to analyze different sorting patterns in diverse aquatic environments due to the placement of the fossils. By his own admission, Dodson mistakenly thought that the duckbill and horned dinosaurs were aquatic, if not semiaquatic.

This is one of the examples where further scientific advancement allows the paleontologist to obtain a clearer picture. As Robert Bakker of the University of Colorado so aptly points out, rivers drown hundreds of steers, washing downstream during floods and burying them in sandbars every year. Does that prove that cows are an aquatic species? Hardly! Remains can be very confusing after a few million years of entombment. We learn answers to old questions and bring new ones to light as further studies reveal more about dinosaurs. Acceptance that the

duckbilled and horned dinosaurs were terrestrial herding herbivores is now widespread. Thus, it was through Peter Dodson's work with the taphonomy that paleontology launched into a new age of discovery and understanding.

If we venture to call Dodson the "Father" of taphonomy, then Phil Currie must certainly be the chosen son. His discovery of an enormous jumble of *Eucentrosaurus* bones (also in Dinosaur Provincial Park) led to an intensive taphonomic study. Employing time-tested methods and new advancements in science, he was able to outline the last moments of death. He determined that while herding, the animals tried to cross a flood-swollen river. Panicking, many drowned as they climbed over each other in their attempt to cross safely. The bodies then floated downstream possibly jamming the river or becoming stuck on the river's edge. Predators ripped the rancid meat from the bones, leaving the broken remains of teeth, while inadvertently crushing the still fresh centrosaur bones under their feet. Spiral fractures indicated that the bones were still fresh when first broken. The next flood buried the broken remains. In time, they came to light again under the searching eye of Phil Currie. With such

great concentrations of bone from a single species many other physiologic and systemic studies will determine information on social behavior, growth, reproduction, climatic influence and pathology within the community.

Problems still face every paleontologist when it comes to taphonomy. The Green River fish fossils of Wyoming died in the thousands. Two separate layers contain preserved fish in the ancient fossil lake, but the cause of death is debatable. Several theories have been offered; sudden inversion of cold water containing hydrogen sulfide; sudden influx of excessive salinity; algae blooms and fish diving too deep to escape the hot surface water. While each interpretation has merit, it will take many more investigations to unravel the exact cause or causes of death.

Gone are the days of a fossil laundry list. No longer is it possible to ignore the wealth of information around the fossil that will tell the engrossing tale of death and resurrection! Science demands that we examine everything related, with all the tools at our disposal, in order to elucidate as clearly as possible our conclusions.

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#### BOOK REVIEW

by Alan Goldstein, Clarksville, Indiana

##### Fossil Atlas Fishes

Karl Albert Frickhinger

Published by Mergus Verlag, 1st English Language Edition, 1995

1088 pp., 900 color plates of fossil fish,  
200 color plates modern fish

Suggested Retail Price: \$79.95

U.S. Distribution: Tetra Sales (Warner-Lambert Company),

Blacksburg, VA. (Can be ordered from any bookstore.)

We got a copy of this book at the Falls of the Ohio State Park because we are in the process of installing several marine aquaria in order to compare modern and Devonian coral reef faunas. I am not a fossil fish collector, per se. This book is written for any fossil collector or aquarist with

an interest in the development of fish groups and how ancient fish appeared.

The high cost of the book is due to the incredible number of color photographs--some 1,100 total. The book is compact at 7.5 x 5 inches and more than two inches thick. Great care was taken to illustrate the finest complete fossil fish in collections from around the globe. Fossil fish (including several un-named species) from more than 75 museums and private collections are represented. The recent work of John D. Long on the Devonian fossil fish Gogo, Australia, is not included.

The book is not organized into well-defined chapters, so the reader has to look at the heading at the top of the page to figure out what section it is. (Of course, the table of contents or index is helpful in that regard.) Frickhinger discusses

collecting and, perhaps of more value, photography of fossil fish. Many of the rocks needed to be under- or over-exposed relative to the light meter indication. For instance, Wyoming fish need to be over-exposed 1 - 2 stops, while Bundenbach fish need to be under-exposed by 1 stop.

The section on the evolution of fishes thorough. However, I am not an ichthyologist and would miss most classification mistakes. John Long's new book "The Evolution of Fishes" would serve as a benchmark in learning about fish evolution. The section on the external features of fish is useful, describing the fins, scales, spines and teeth.

Each fish group begins with a one-page introduction and a chart showing the geological range. Each fish genus is set up in the same manner with a color photograph and line illustration and basic information. I will use *Cladoseelache*, an upper Devonian shark as an example:

Color photograph of the species *Cladoseelache clarki* Claypole from the Devonian of

Cleveland, Ohio, U.S.A.

Original in the Museum of Natural History in Cleveland.

Chondrichthyes/

Cartilaginous Fish; Order: Cladoseelachiformis; Family: Cladoseelachidae; Genus: *Cladoseelache* Dean, 1894; Synonyms: *Cladodus*; Horizon: Upper Devonian; Geographical Distribution: North America; Features: harks with a spindle-shaped body. Head with a blunt snout. Two dorsal fins.



*Cladoseelache*, reconstruction after HARRIS.

#### OLDEST ANIMAL-FOSSIL FIND

Several newspapers have recently reported the finding of what could be the oldest known animal fossil, a jellyfish-like creature that lived up to 600 million years ago. The discovery was made by Mark McMenamin, Mount Holyoke College, in March in the Mexican desert about 100 miles south of Tucson, Arizona.

Etched in sandstone and shale, his fossil find was lying exposed on the desert

Heteroceral forked caudal tail which nevertheless externally looks almost homoceral. [These terms are defined and illustrated in the section on external features.] Skin largely naked. Teeth with large middle cusps and smaller lateral cusps (cladodont). Very large pectoral fins. A strong spine in front of the first dorsal fin. Maximum length about 1 meter. Remarks: Probably rapid swimmers and formidable predators. Recent relatives: None, died out in Upper Devonian.

Another outstanding feature of the book is a 30 page bibliography, broken down by fish group. There are six different indices(!) including: Genera and Synonyms; Orders, Suborders and Families; Genera Arranged by Formation [actually period or epoch] Genera Arranged by Locality and an Index of Recent Families and Genera. The Locality index is in alphabetical order, but due to translation from German is peculiar. It is not organized by country, but rather by specific location. Page 1073 localities (as listed) are: Gosford, Australia; Greenland; Holzmaden, Germany; Illinois, U.S.A.; Iran; California, U.S.A.; Kansas, U.S.A. It is not complete. Careful examination did not reveal any Wyoming locality in that index. One hundred sixty-three Eocene fish genera are in the index by formation, but include European and Wyoming fish.

Overall, this book is highly recommended for any collector of fossil fish or persons interested in seeing the amazing variety of fish that have been collected around the globe. Frickhinger, in his acknowledgments tells the reader that the book "involved great personal and financial outlay"--and it shows!

floor. It appears to be a 2-inch-long form of a new species of Ediacaran biota, having a central bell, like on a jellyfish, and tubes radiating outward.

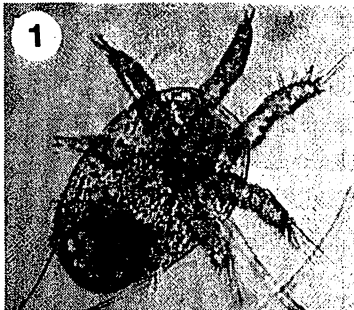
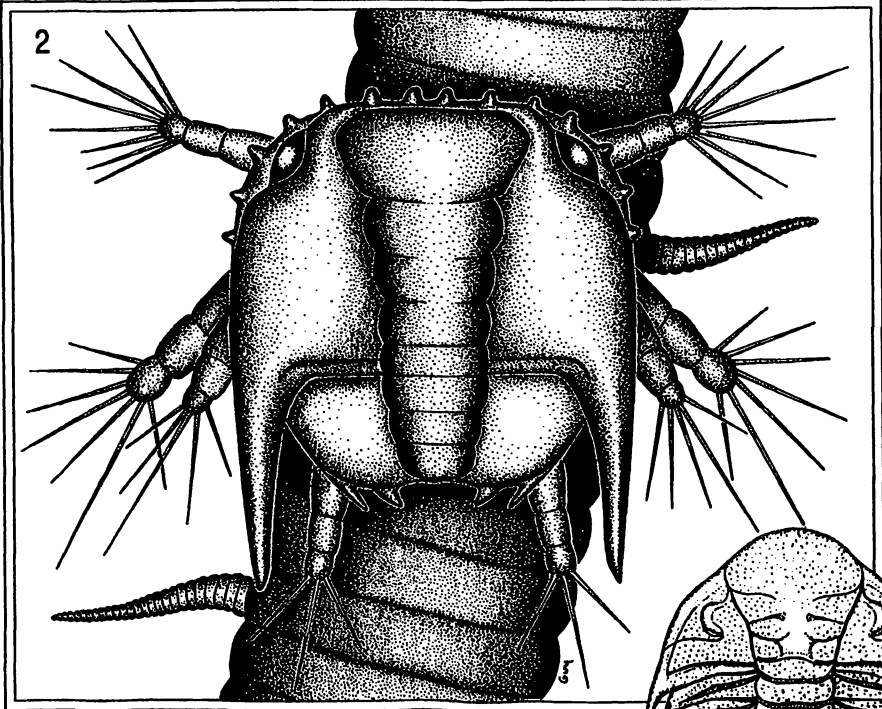
Ediacarans are among the oldest known creatures that can be considered animals. If the age of the fossil turns out to be correct, it will suggest that animal life evolved earlier than previously thought. It also may help to shift the search for early animal life from Australia, Russia and Africa to America.

TRILOBITE BABIES

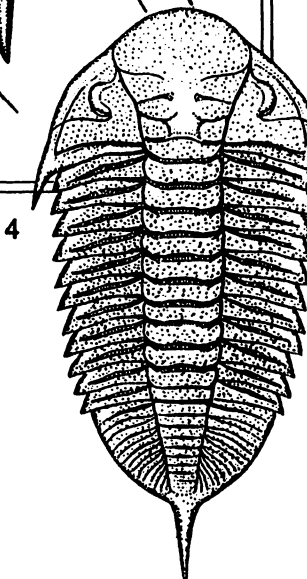
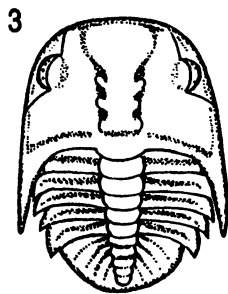
from PALEO Notes, Nov/Dec 1992, Guy Darrough, ed.

Trilobite eggs have never been found, but undoubtedly, trilobites laid eggs as all arthropods do, and certain trace fossils are thought to be pits dug by trilobites to lay their eggs in. After a trilobite hatches, it's a soft larval form called a nauplius (fig. 1). At this stage, the larva is less than a millimeter in length and looks similar to those of modern marine arthropods like the Horseshoe crab. The nauplius was capable of movement, but mainly drifted on the ocean currents.

The next step in development is called the protaspid stage (fig. 2), and this is when the trilobite develops an external, mineralized shell called an exoskeleton. It's during this period that a division between the cephalic region (head) and the protopygidium (tail) appears. Structures like facial sutures, eye ridges, spines and hypostoma begin to develop.

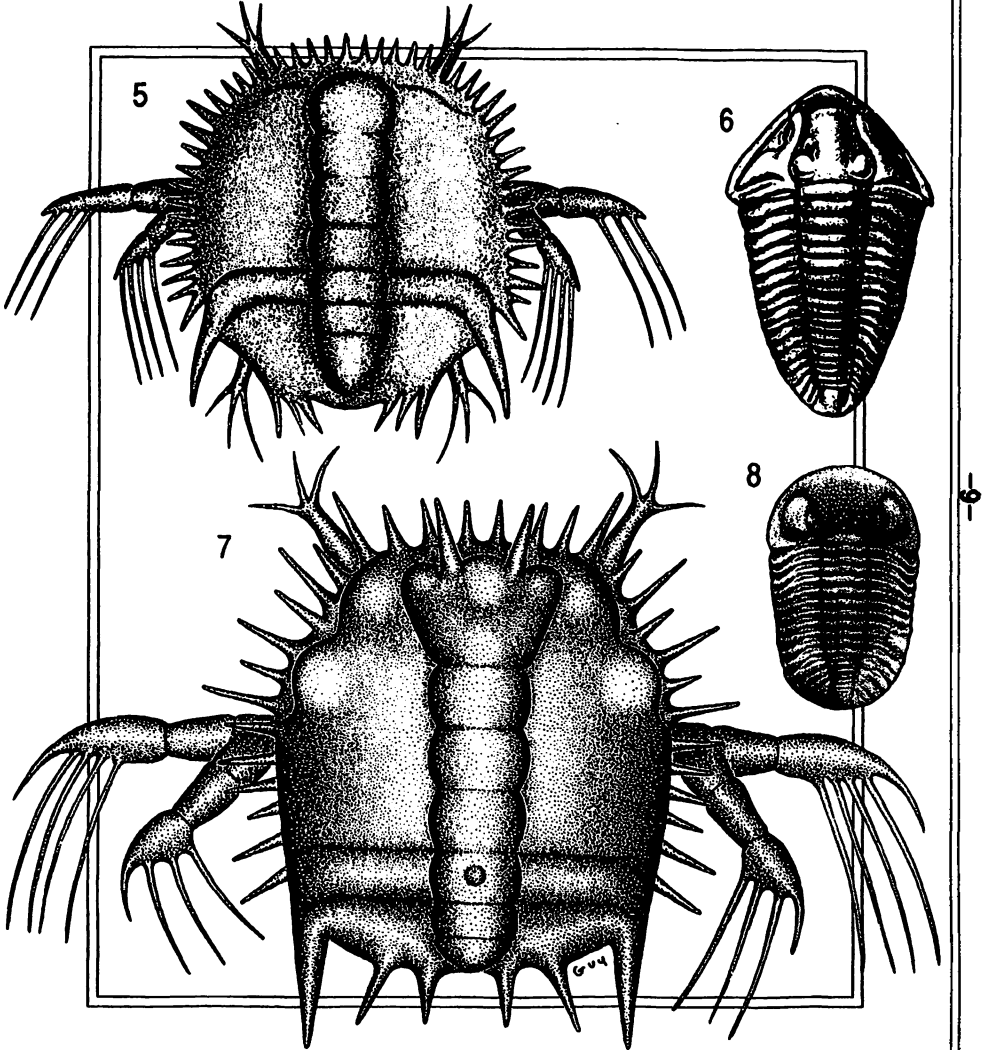


Modern Nauplius Larva



The next step is called the meraspid stage (fig. 3), and this is when the trilobite begins to develop thoracic segments, which are formed at the anterior portion of the tail. The meraspid begins to grow larger by a series of larval molts, and adult features begin to appear.

The next period of development is called the holaspid stage (fig. 4), and this stage starts when the last thoracic segment is formed. The adult features are nearly complete. At this point there is a great increase in size, and the tail is then referred to as the pygidium. The holaspid stage continues until the animal dies.



5. Protaspid stage of the common Ordovician trilobite, *Flexicalymene meeki*. 6. Holaspid stage of *Flexicalymene meeki* (adult). 7. Protaspid stage of the Devonian trilobite, *Phacops milleri*. 8. Holaspid stage of *Phacops milleri*. (appendages restored)



**ADVERTISING SECTION**

Ads are \$5.00 per inch (6 lines x 1 column--43 spaces). Send information and checks payable to MAPS to: Mrs. Gerry Norris, 2623 34th Avenue Ct., Rock Island, IL 61201. Phone: (309) 786-6505.  
This space is a \$5.00 size.

To extend currently running ads, please send request and remittance to Editor by the 15th of the month. We do not bill. Ads do not run in the EXPO issue (April). Ads up to 8 lines by 54 spaces can be printed in smaller type to fit a 1" space.

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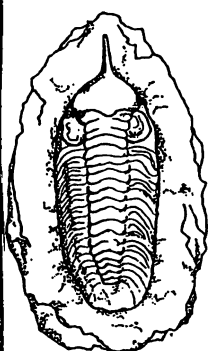
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**FOSSIL HINT**

from *Paleo Newsletter*, 5/94  
Jean Wallace, ed.

One way to clean fossils is to put them in an old bucket out in the backyard and cover them with water. Then add a little Sani-Flush. After it quits fizzing, pour off water. Repeat if necessary, rinse and dry.

*Lake Agassiz Rock Hound, PaleoDiscovery 12/91*

**PLEASE NOTE THE FOLLOWING CHANGES OF ADDRESS OR CORRECTIONS:**

David M. Cassel NEW PHONE  
7000 Soquel Dr. #351  
Aptos CA 95003  
408-761-9257

Jerry A. Jacene Currently (95) doing volunteer work at the St. Paul Science Mus. (Paleo-Lab) preparing jackets from the field. (Cretaceous in age); mostly crocodiles.  
3000 E. Cliff Rd., Apt 310  
Burnsville MN 55337  
612-882-8529

Glen J. Kuban  
14139 Pine Forest Dr. #310  
North Royalton OH 44133  
216-237-4508  
FX: 216-749-7386  
EMAIL: paleo@ix.netcom.com

Don Smarjesse NEW ZIP  
23628 Stonehenge  
Novi MI 48375  
313-476-3386

# VHS TAPE ORDER FORM

PLEASE NOTE THE DIFFERENCE BETWEEN TAPE AND PROGRAM.

PLEASE MAKE UP THE FOLLOWING PROGRAMS FOR ME.

PROGRAMS AVAILABLE (time):

1. Arthropods & Crustaceans. (34)  
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4. Echinoids..... (48)
5. The Fossil Story & WV.... (48)  
Stone Fish (for 6th graders)
6. Crinoids..... ( )

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SEND ORDER TO: G11 Norris  
2823 34th Avenue Ct.  
Rock Island, IL 61201

**Please ADD the Following NEW OR REJOINING MEMBERS to Your Directory:**

Lyle Daly  
30 E. Georgia #517  
Indianapolis IN 46204  
317-632-3334

Architect. Major interest trilobite & crinoid collecting. Has for trade plant fossils from Mazon Creek. Member of Indiana Soc. of Paleo. Has enjoyed collecting & studying fossils since he was a child and want to meet others who share his interest.

Larry Erickson  
2470 SW 173rd Court  
Beaverton OR 97006-4332

Lou Harvey  
2102 Monastery Circle  
Orlando FL 32822  
407-282-5676

Retired. Will trade. Major interest fossil wood, invertebrates, and vertebrate trilobites. Has for trade echinoids, petrified wood, brachiopods. Member of Florida Fossil Hunters & Bone Valley Fossil Soc. Wants to interact with other fossil lovers and attend shows.

Jim O'Brien  
2002 Berkshire Pl  
Wheaton IL 60187  
708-682-3347

Stan Raugh  
& Diana Lawrence (spouse)  
4217 8th Ave.  
Temple PA 19560-1805  
610-926-5822

Caseworker. Will trade but prefers to buy. Likes all fossils, esp. shark's teeth, trilobites, footprints, some fish, insects in amber. Has for trade some insects in amber, can get more, possible fish, etc., in small quantities. Correspond with, meet other collectors, obtain fossils at reasonable cost someday see international fossil club formed (MAPS is international, ed.), protect collecting rights.

Dave Schlichting  
1207 E. 11th #4  
Davenport IA 52803  
319-326-2546

Treatment Operator (IA American Water Co.). Will trade. Nothing for trade yet (95).

Joe Sullivan  
293 Burch Ave.  
West Seneca NY 14210

Dennis Whitney  
12723 Richmond  
Grandview MO 64030  
816-763-9351

Chemist.

Bill & Cheryl Wildfong  
639 Woodley Rd.  
Maitland FL 32751  
407-339-1136

Telephone Co. Engineer/Graphic Design Artist. Will trade. Major interest invertebrate & invertebrate. Have for trade echinoids, fossil shells (many extinct) species Caloosahatchee beds. Members of Bone Valley Fos. Club, Florida Fossil Hunters, & Florida Paleo Soc. Want to gain and to share information on fossils, trade, and collect and display fossils, meet friends with the same interest.

Jim Wyatt  
1517 Greentree Lane  
Garland TX 75042  
214-494-3443

Preparator. Will trade. Major interest echinoids and sponges. Has for trade Permian vertebrate material, TX echinoids, TX sponges, TX ammonites. Member of Dallas Paleo Soc. Many of his friends are MAPS members.

The Mid-America Paleontology Society (MAPS) was formed to promote popular interest in the subject of paleontology; to encourage the proper collecting, study, preparation, and display of fossil material; and to assist other individuals, groups, and institutions interested in the various aspects of paleontology. It is a non-profit society incorporated under the laws of the State of Iowa.

Membership in MAPS is open to anyone, anywhere who is sincerely interested in fossils and the aims of the Society.

Membership fee: One year from month of payment is \$20.00 per household. Institution or Library fee is \$25.00. Overseas fee is \$20.00 with Surface Mailing of DIGESTS OR \$30.00 with Air Mailing of DIGESTS. (Payments other than those stated will be pro-rated.)

MAPS meetings are held on the 2nd Saturday of October, November, January, and March and at EXPO in April. A picnic is held during the summer. October through March meetings are scheduled for 1 p.m. in Trowbridge Hall, University of Iowa, Iowa City, Iowa. One annual International Fossil Exposition is held in April.

MAPS official publication, MAPS DIGEST, is published 9 months of the year--October through April, May/June, July/August/September.

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Dated Material - Meeting Notice

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 MAPS DIGEST Editor  
 Mrs. Sharon Sonnleitner

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