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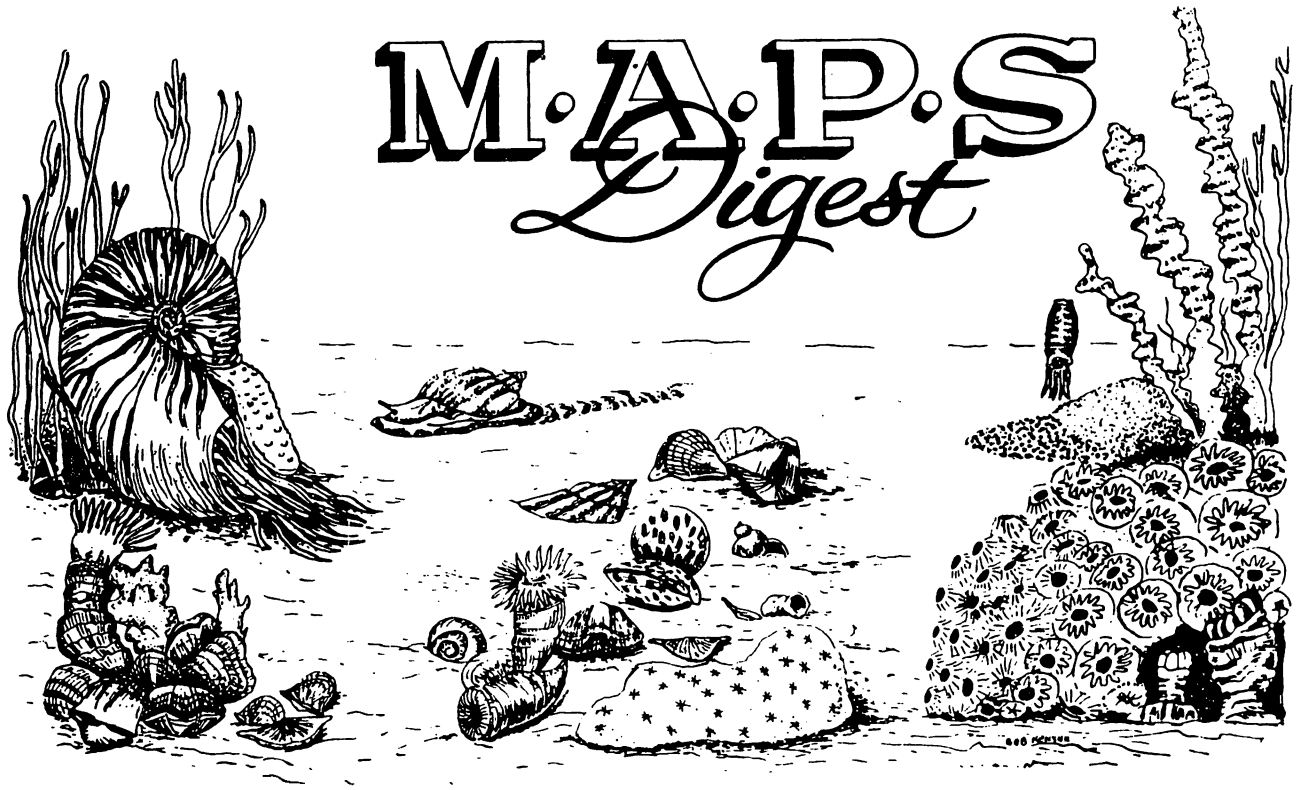
NUMBER 5



Official Publication of
Mid-America Paleontology Society

May, 1984

VI DOWN; VII COMING UP

I'm no neophyte when it comes to fossils. I've been collecting, trading, and buying fossils for 25 years. So what could I expect to come across at the EXPO that would be new? Would you believe I came home with more than 30 new specimens--including: trilobites, brachs, horse tooth, shark's tooth fish, fern leaves, crinoids, corals, connularia, crab, lobster, snails, clams, starfish, and ammonites.

Where in the world did they all come from, you ask. They were from the states of Pennsylvania, California, Wisconsin , Ohio, Oregon, Arizona, Texas, Florida, Kansas, and Iowa. Foreign countries represented in my new specimens include: Morroco, France, Germany, England, Canada, Peru, Bolivia, Brazil, and Poland.

I can hardly wait until EXPO VII. Won't you start planning now to join us April 19, 20, and 21, 1985, in Macomb, Illinois.

Submitted by
Don Good
Aledo, Illinois

Did you ever see a trilobite nesting? Ask Marty Sutherland, Bishop, California.

MARK YOUR CALENDARS

5 May -- MAPS Meeting -- Cedar Rapids Gem & Mineral Show -- IBEW Union Hall 1211 Wiley Blvd. SW off Highway 30 See page 2 for map.

18 May -- MAPS Field Trip -- Cincinnati, Ohio
19 Dan Cooper -- 513-829-4662
20 See page 2 for more information.

26 May -- MAPS June Meeting -- Memorial Weekend 9:30 Buffalo, Iowa, Town Park
27 Milan Quarry -- Don Good, 309-582-5232. No Digest except this one, if you have questions ask now.

15 June - Bedford Rock Swap -- 4-H Fairgrounds
16 MAPS MEETING -- Indiana Chapter
17 Bedford, Indiana

30 June - Monmouth & Biggsville -- Don Good, Capt.

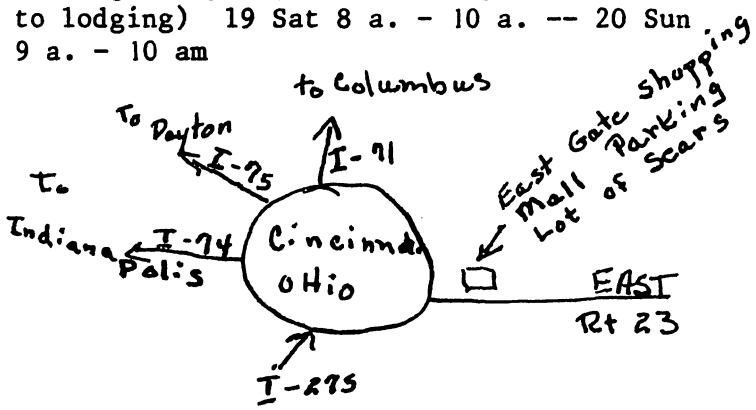
4 Aug -- Canton/Farmington, Il -- Pennsylvanian

1 Sept - MAPS Meeting -- Humboldt -- Mississippian -- Labor Day Weekend

26 Oct -- FOSSILMANIA -- Austin Paleontological
27 Society -- MAPS Affiliate -- Oakdale
28 Park, Glen Rose, Texas. Frank Crane 512-327-4005

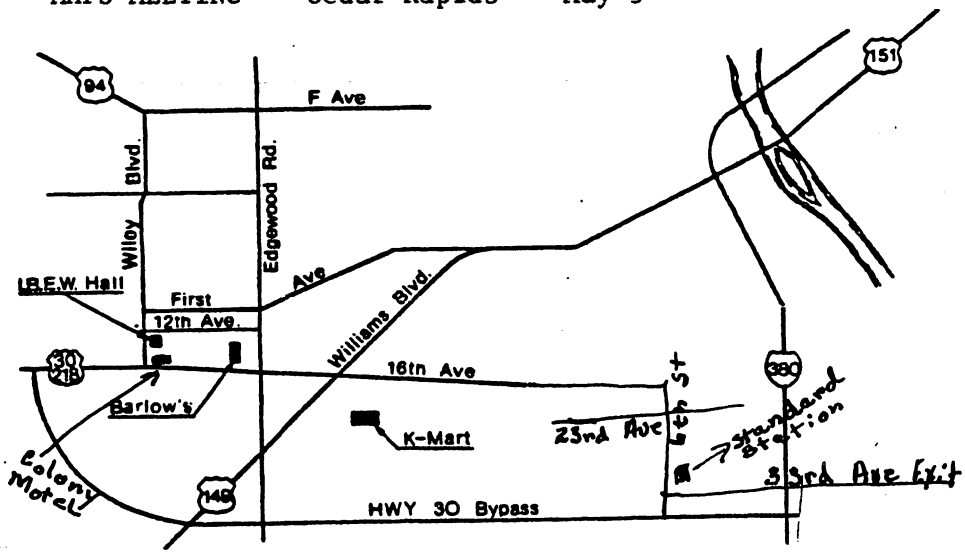
CINCINNATI FIELD TRIP -- MAY 18, 19, and 20

Will meet in Sear's Parking lot
Car with 3' sign on top saying "Trilobites"
Meeting: May 18, Fri. 6 - 7 p.m. (to direct to lodging) 19 Sat 8 a. - 10 a. -- 20 Sun 9 a. - 10 am



Dig trilobites, other fossils. Must be MAPS member. Relinquish 6" + Isotelus value too great for owner to allow for a keeper. Donate to owner fossil worth $10.

MAPS MEETING -- Cedar Rapids -- May 5



A TREASURE TROVE OF FOSSILS

Each of you has probably received a letter from the Tampa Bay Mineral and Science Club, Inc., 4706 West Osborne Avenue, P. O. Box 15176, Tampa, Florida 33684. The letter concerned a request for a donation to fund a research project--the excavation of an old river bed.

In the April 2, 1984 NEWSWEEK, p. 72, you may read an article concerning this discovery and dig. Comparisons are being made between this excavation and the La Brea tar pits of Los Angeles.

MAPS members voted at EXPO VI business to not send a check from the club but to encourage club members to send personal checks if they so desired.

This is a very legitimate dig. Donations will be receipted and may be used for tax deductions.

EXPO VI IS HISTORY

But before she becomes only a memory--very special thanks to these dedicated and efficient people. Show Chairman Doug Johnson, Donnellson Iowa and his Co-Chairman Karl Stuerkerjuergen, West Point, Iowa; Tom Witherspoon, Dearborn, Michigan, for all the advertising before the show; Table Reservations Bob Durnal, Reynolds, Illinois and Tom Walsh, Coal Valley, Illinois; Auction Paul Rechtan, Harvard, Illinois and Auctioneer, Dennis Kingery, Rock Springs, Wyoming, with back up from Paul Caponera, Blue Island, Illinois and Jamie Stout Cedar Rapids, and Danny Ulmer, Black Hawk Fossils, Rapid City, South Dakota; Reception Desk Peggy Walsh, Coal Valley, Illinois, and oh so many helpers from the membership; Allyn Adams, Davenport, Iowa, whose tedious task was the rewrite of the By-Laws and Constitution--he got it all ready for a vote at EXPO; Doug DeRosear, Donnellson, Iowa, leader of field trips after the Big Show; and Wally and Esther Harris who work as Laison with Western Illinois University. The facilities are excellent. We would be hard-pressed to find a spot to equal them. Wally managed a little time even though it was IRS season.

Your Membership Directory--you've noticed some new sections--LaVeta Hodges, Shawnee, Kansas, is responsible for the Paleo Soccieties listing; and Alberta Cray reduces, proofreads, types, prints, cuts, punches, clips the work together. This year, more and bigger, she had to call for help from Marv and Sue Houg.

Someone at EXPO commented "you walk in and it's so smooth it looks as though it just happened." Like all shows lots goes on behind the scenes.

AND NOW -- DREAM DREAMS OF EXPO VII!!

FOSSILS OF THE BURGESS SHALE -- Dr. Frederick J. Collier, Collections Manager
National Museum of Natural History, Department of Paleobiology
Washington, D.C. 20560

Imagine this--about 3 weeks before EXPO, your phone rings, a man identifies himself as the Collections Manager with the National Museum of Natural History, Smithsonian Institution, Washington, D.C., and asks if he might bring a display of Burgess Shale fossils to EXPO and would the local club supply cases. Sort of takes one's breath away, but that's how it happened.

Dr. Collier didn't get much satisfaction about the cases from MAPS (we don't have any) so he called the Geology Department at Western Illinois University and they supplied him with 18 feet of case space and a roll-away bulletin board to complete the spectacular addition to the EXPO. You would have been informed in the March Digest, but we didn't know of the surprise then either.

The fossils from the Burgess Shale are on a carboniferous shale--very hard. They are black and compressed. One collector said "when I first looked at some of the specimens, I thought, had I found the material in a quarry I'd probably have thrown it on the spoils pile." That was before the lecture. After the lecture those flattened creatures took on a whole new dimension.

Dr. Collier was extraordinarilly accommodating--a lecture to WIU Geology students Saturday morning, MAPS members Saturday afternoon. He is enthusiastic, well informed about his subject, easy to understand so one can conceptualize not only the Middle Cambrian seas, but also the process of locating the rock strata for quarrying. The miracle, and indeed it must be a miracle, was that Charles Doolittle Walcott literally stumbled over the fossil rock which had tumbled down the precipitous terrain to the footpath below.

Dr. Collier began his talk with the statement "The Middle Cambrian, 530 million years ago, was teeming with life."

A few geological deposits have been discovered that as a result of exceptional circumstances contain exquisitely preserved fossils of animals that are partly or entirely soft-bodied. One such deposit, and by far the most exceptional and best known is the Burgess Shale of western Canada. The great age and the rich variety of the marine invertebrates in the Burgess Shale make it the best known.

In the fall of 1909 the Secretary of Smithsonian Institution, Charles Doolittle Walcott, was searching for fossil bearing rock formations in British Columbia. Following a footpath that ran across the western slope between Wapta Mountain and Mount Field, Walcott literally stumbled over a block of shale that had fallen onto the path from the slope above. Examining the easily split rock, he was astonished to find the fossil impressions of a number of soft-bodied organisms preserved in its layers.

Walcott returned to the spot the following year to search upslope for the shale stratum, source of the fallen rock. He found two fossil bearing shale exposures separated by a vertical distance of some 70 feet. (Ed. comment--pictures of this terrain show it to be very steep.) He did shallow quarrying in both; the lower exposure proved to be the most fossiliferous of the two. He shipped thousands of fossils back to the District of Columbia.

The fossils of the Burgess Shale include more than 120 species of marine invertebrates.

Such remarkably preserved soft-bodied fauna, representing eight known and 10 or more previously unknown phyla that flourished in the Middle Cambrian is of exceptional importance to the fossil record. The Burgess Shale invertebrates, with their specialized adaptations, have an even wider importance in clarifying the early evolution of the animal kingdom. Other soft-bodied preservations include the Ediacara animals in the Ediacara Hills of southern Australia and 2 exposures in Germany--Solnhofener and Bundenbach--the Marjum and Wheeler formations in Nevada and Utah and Mazon Creek nodules from Illinois.

The Burgess Shale fauna is an explosive evolutionary diversification of multicelled animals that took place near the beginning of Cambrian time. The fossils of the Burgess Shale give a unique glimpse into the results of adaptation relatively soon after it occurred.

The animals of the Burgess Shale fauna lived on or in a muddy bottom where sediments had accumulated at the base of a gigantic reef. This

This structure, made up of material secreted by algae, rose vertically for hundreds of feet from a deep-water basin that was gradually being filled with sediments. Scattered outcrops of the reef front can still be traced for miles across British Columbia. The bottom waters of the basin were apparently limited in circulation, rich in hydrogen sulfide and poor in oxygen. The various invertebrates flourished where the muddy sediments were banked high enough against the reef to be clear of the stagnant bottom waters, about 530 feet below sea level.

The reef-front sediments were not stable. Studies show that periodic slumping resulted in the flow of mud into the deeper anaerobic waters of the basin. These flows wiped away all the surface tracks and subsurface burrows made by the Burgess Shale fauna. Because the animals trapped in the torrents of mud died during or shortly after their burial they could not leave new traces. This means that the way of life of each species must be deduced from a study of their organs of locomotion and from comparisons with living invertebrates of the same kind.

At the same time the catastrophic burials, in anaerobic deposits of fine silt where scavengers could not survive, greatly favored the preservation of the animals' soft parts. As the mud gradually compacted and became hard rock the buried carcasses were flattened and the soft parts were transformed into thin films of calcium aluminosilicate. In general the films are rather dark, but certain parts of most specimens are preserved as highly reflective areas.

Although the animals'soft parts are wonderfully preserved, signs of rotting after burial can often be detected. Many specimens are associated with a black-stained area, a result of the body contents of the carcass seeping out into the surrounding mud.

Burial in a mud flow has other important effects. For one thing, many of the animals came to be buried at all angles; the shale bedding has therefore preserved them in a variety of orientations that reveal much moremore of the animals' anatomy than simple horizontal burial does. For another, the fluid sediments that penetrated between the appendages of animals such as arthropods and polychaetes during the turbulent flow of silt were eventually reduced to thin layers of shale. Judicious work with a micro-chisel enables one to remove these fine layers, thereby revealing further details of a specimen's anatomy that would otherwise remain hidden.

The fossils found at most Cambrian localities are the exoskeletons of such arthropods as trilobites, the shells of various members of the brachiopod phylum and of such echinoderms as the extinct plate-shelled Eucrinoid class. Animals such as these account for barely 20 percent of the invertebrate genera in the *Burgess* Shale.

In some Cambrian fossil assemblages certain rather peculiar species were able to flourish because access by sea to the area of deposition was limited. The Burgess Shale, on the other hand, lay at the edge of the open sea and would have been exposed to colonization by marine larvae floating in from other areas. This circumstance adds weight to the hypothesis that the Burgess Shale fauna approaches the Cambrian norm.

Most of the species found in the Burgess Shale can be placed in the ecological framework of a bottom-dwelling marine community that thrived on the muddy sea floor between intervals of slumping. The mud supported an active group of burrowing invertebrates, with priapulid worms predominant. Attached to the sea floor and growing to various heights were a variety of sponges representing at least 15 genera; they fed on food particles suspended in the water. Actively patrolling the sea-floor surface or plowing through the mud in search of food were many species of arthropods. Certain brachiopods occupied a peculiar niche: they attached themselves to the elongated spicules of one of the sponges, Pirania. For the brachiopods the advantages are obvious: they lived somewhat above the turbid waters of the sea floor and could capture food particles such as the sponges fed on at these higher levels.

In addition to this community of fixed and mobile surface dwellers and burrowers a number of free-swimming species inhabited the water along the reef front. The different members of this pelagic fauna probably lived at different depths some among them may have been species swept into the reef-front area from the open sea.

At most Cambrian fossil localities the mineral-

ized exoskeletons of trilobites, the most familiar of all Paleozoic arthropods, are in the majority. In the Burgess Shale, however, trilobites--with one exception--are comparatively unimportant. The exception is Olenoides. Olenoides had a pair of slender antennae in front and a pair of cerci, or antennalike structures, in back. The limbs along the length of the animal, up to 16 of them, were all similar in construction. The coxa, a large unit closest to the body, carried a battery of ferocious-looking spines. Attached to the coxa were two appendages; one was a filamentous gill and the other was a walking leg. Olenoides could seize and shred soft food, such as small worms, and pass the fragments along to its mouth. The forward antennae and the rear cerci no doubt supplied the animal with information about both food and potential predators. The fact that the primitive limbs of this trilobite are all similar is in marked contrast to the arrangement in many fossil and living arthropods whose limbs are variously modified and specialized.

About 40 percent of the Burgess Shale fauna consists of arthropods. Both in the number of species and the number of individual specimens the soft-bodied representatives of the phylum outrank the hard-shelled trilobites. Many of the "nontrilobites" have had their appendages preserved in remarkable detail; some of them must have been effective predators and scavengers.

Of the Buress Shale animals other than arthropods the representatives of six phyla are noteworthy. Echinoderms, coelenterates, sponges, "worms", mollusk, a chordate.

Perhaps the most intriguing problem presented by the Burgess Shale fauna is the 10 or more invertebrate genera that so far have defied all efforts to link them with known phyla. They appear to be the only known representatives of phyla whose existence had not even been suspected. Their origins must lie Precambrian obscurity, where the initial metazoan diversification began.

The Burgess Shale fauna affords both a marvelous glimpse of evolution in action during this brief interval of Middle Cambrian times and a stern reminder of how impoverished and distorted the fossil record is. The study of these soft-bodied animals illuminates many hitherto un suspected aspects of the history of life.

(Ed. comment. This article included exerpts from Dr. Colliers lecture and exerpts from an article "The Animals of the Burgess Shale" by Simon Conway Morris and H. B. Whittington.

Perhaps one of the most fascinating parts of Dr. Colliers slide presentation/lecture was the Burgess Shall Diorama. His air view of the present landscape and the colorful diorama caused the fossils in the display cases to take on entirely different perspective. Excellent, exciting presentation.)

Dr. Collier was pleased with the response to his lecture and was able to make several contacts for the Museum from MAPS collectors.

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PRESS RELEASE ** PRESS RELEASE **

THE PALEONTOLOGICAL SOCIETY

ANNOUNCING 1984 AWARDEES

The Paleontological Society is a North American based international organization devoted to the advancement and application of all aspects of the science of Paleontology. The Society publishes three journals: Journal of Paleontology, Paleobiology, and Paleontological Society Memoirs. In addition, there are occasional book length publications and Short Course Notes on an annual basis about particular groups of fossils. The Society gives three, usually annual, awards for distinguished accomplishment in Paleontology.

PALEONTOLOGICAL SOCIETY MEDAL --- The 1984 recipient of the Society's Medal is Dr. Curt Teichert, Adjunct Professor, Department of Geological Sciences, University of Rochester, Rochester, New York. Dr. Teichert has had a long exceptional career carried out from professional positions in Germany, Australia, and the United States. In America, he has worked for the U. S. Geological Survey and the University of Kansas as well as the University of Rochester. He has been the Director of the Paleontological Institute, University of Kansas and joint editor of the Treatise on Invertebrate Paleontology, which is the single largest compendium of information about fossils ever assembled. His main research emphasis has been with fossil cephalopods which are related to the living fossil Nautilus. Dr. Teichert's paleontological expertise has resulted in invitations to study fossils, and

their geological applications, in Greenland, Kashmir, Transcaucasia, Turkey, Iran, Pakistan, China, Japan, and elsewhere. He has numerous publications in paleontology paleoecology, evolution, regional age relation his of rocks, and principles of establishing the ages of rocks using fossils.

PALEONTOLOGICAL SOCIETY SCHUCHERT AWARD -- The 1984 recipient of the Society's Schuchert Award is Dr. Daniel C. Fisher, Assistant Professor, Department of Geological Sciences, University of Michigan, Ann Arbor, Michigan. This award is given for Excellence and Promie in Paleontology to a person under 40 years of age. Dr. Fisher's research interests are in evolutionary functional morphology, evolutionary systematics, processes of skeleton formation, and processes of fossilization. He has previously taught at the University of Rochester and is a Research Associate of the Field Museum of Natural History, Chicago. He was recently awarded the University of Michigan's Henry Russel Award, for excellence in teaching and research; this is the highest award the University can give to a junior faculty member.

HARRELL L. STRIMPLE AWARD --- This newly established award is to recognize outstanding achievement in paleontology by amateurs. The first recipients of the award are the Gunther Family of Brigham City, Utah -- Lloyd, Metta, and their son Val. The Gunthers have collected fossils for 30 years, they are particularly interested in Cambrian fossils. The Cambrian was the time when shelly organisms first became abundant in the evolutionary record. All of their collections are well documented, and the scientifically important specimens are donated to museums or to specialists for study. Especially noteworthy among their finds are Middle Cambrian soft bodied organisms from Utah and Idaho which are not normally fosilized. The Gunthers have published a popular compilation on trilobites and associated fossils in the Brigham Young University Geological Studies.

For additional information contact John Pojeta, Jr., Secretary.

Lloyd and Metta and Val have received a letter announcing the Award. It will be presented at the Society's Annual Meeting, with the Geological Society of America, in Reno, Nevada, Tuesday, November 6, 1984, Harrah's Hotel, 12:30. Because they are the first recipients of the Strimple Award, they will set a precedent. Only one will speak and comments 3-5 minutes long would be appropriate.

MAPS extends you all our congratulations! Gunthers locate spots on top of mountains and in the desert. The fruits of their efforts are in museums throughout Utah. Lloyd has written several articles for the Digest, the most recent in March, vol. 7 no. 3.

It's exciting!.

THE WORLD OF FOSSILS --

Dr. Merrill Foster -- Copyright, 1984
Department of Geological Sciences
Bradley University
Peoria, IL 61625-9989

IN PURSUIT OF THE ICY BRACHIOPOD
Species Taxonomy

There is no easy formula for species recognition in Recent brachiopods. Each case must be evaluated on its own merits by using large population samples and taking account of character variation, ecology, and distribution.

Many modern brachiopod species have considerable geographic ranges. These broad ranges contrast sharply with the very limited geographic ranges of most fossil species. I believe that this difference reflects the very narrow morphological definition of many fossil species. The Recent wide-ranging species Liothyrella uva has populations in various parts of its range that differ considerably from each other in morphology. These differences are due to the separation of the populations and the different environments the populations inhabit which have affected their phenotypes and genotypes. If these populations had been preserved in the fossil record, they almost certainly would have been called different species and instead of one species, there would be at least six. Naming variants as different species can

obscure important environmental and geographic information.

On the other hand, some valid species differ from each other by seemingly small differences. For example, Magellania joubini in the Ross Sea is superficially more similar to Magellania fragilis than some of the geographic populations of Liothyrella uva are to each other. As a moderate "lumper" I started my studies with the view that the two species of Magellania off Antarctica just represented variants of one species. However, careful study of many samples over a wide area of the Ross Sea showed that the were different species: Magellania fragilis largly in deep water and M. joubini largely in shallow water. In fact, I discovered there was a similar third species of Magellania, M. spinosa (now called Fosteria spinosa by the Russians) primarily along the seaward edge of the Ross Shelf. Thus either the morphological "splitter" or "lumper" may be correct, depending on the particular situation. To assign a priori specific value to certain characters without regard to individual circumstances is completely unwarranted.

Generic Taxonomy. --- Because of the subjective nature of the genus, there can be no right or wrong in their establishment. Studies of the modern brachiopod fauna suggest that continued maintenance and establishment of the inordinate numbers of narrow or monotypic brachiopod genera in both the Recent seas and the fossil record is both unreasonable and impractical since these genera are too often the results of uncritical oversplitting or too narrow a definition of monophyly. They convey little information of value that is not already provided by good species and simply overburden the literature. For example, using the standard fossil brachiopod approach, the populations assigned to the living genera Terebratella and Magellania would be split into eleven different genera. Of these eleven genera only one genus would contain more than one species. The broad genera Terebratella and Magellania are not altogether satisfactory, but do play a much more practical role in taxonomy than numerous narrow genera.

Conclusions. --- The study of the systematics of the modern southern hemisphere brachiopods does not reveal any radical departures from the basic relations seen in most well studied animal groups. They show that we must live ith at least a certain amount of uncertainty in our classifications and with many taxa that are not sharply delimited. Tiny morphological differences should be noted and analyzed using as many large samples as practical, but name giving should be controlled in our search for a classification that as Mayr (1969) says "will combine maximal information content with maximal ease of retrieval of this information." The standard hierarchy of character values for brachiopods might do more good if it were shoved down one level so that specific characters became intraspecific characters, generic characters specific characters and so on. However, a priori assignment of categorical value to certain types of characters should not be done.

"Soft part" anatomy at the specific and generic levels in modern brachiopods does little more in most cases than complement the more easily observable differences in the calcareous skeleton. Therefore in the study of fossil brachiopods the lack of "soft parts" does not seem to be the handicap that it is in some other organisms. However, at the family level and higher, "soft part" anatomy appears to have considerable value.

Paleontologists who publish taxonomic works would greatly help both other scientists and amateurs if they would include keys, particularly pictorial ones, in their publications to aid in the identification of taxa. Impractical, hard-to-use taxa benefit no one in the long run and have given a bad name to paleontologists.

Ecology. --- The southern hemisphere brachiopods have adapted themselves in a number of ways to cold water. The most obvious is reduction in the calcite in their shell and body spicules. Cold water dissolves calcite readily so that it requires an abnormally large energy expenditure to precipitate calcite under those conditions. By precipitating less of it in their bodies and shells cold-water brachiopods conserve needed energy. As an extreme example, the species of Crania in the southern hemisphere greatly reduce or eliminate all the calcite in their pedicle valve. Terebratulides all have fine extensions of the mantle (mantle caeca) extending into the shell material. The holes are called punctae. The function of these

caeca are not known with certainty. Some reasonable possibilities are aid in constructing shell and/or repairing damage, inhibitors of shell-boring organisms like bryozoans, and means of secondary respiration when the shell is closed. Campbell (1965) suggested, based on fossil studies, that punctae density was directly proportional to water temperature--cold water brachiopods having fewer punctae for a given shell area than warm water brachiopods. I made numerous counts of modern brachiopods punctae. They confirm Campbell's contention. However, they suggest a great variability in this feature as well as some species that strikingly differ from the normal condition and may even show the reverse correlation.

Some species of M. macquariensis that may have evolved in colder water seem to be moving north now, but because of their cold water adaptation they are forced to move into deeper colder water as they move further north into warmer surface water.

My cruises off Antarctica enabled me to be the first brachiopod student to discover the calcite-penetrating ability of the brachiopod pedicle in some taxa. Many unexplained pits or perforations in brachiopod shells had their origin this way. We are now finding these rather commonly in both Recent and fossil brachiopods.

A rather mysterious situation was discovered off one of the subantarctic islands. Here all I found were empty brachiopod shells. I have seen no other place like this in my travels. This locality was apparently far from strong sources of human pollution so all I could deduce is that a disease or influx of new efficient predators or temperature change totally eliminated the population.

Off one subantarctic island, many of the live brachiopods occurred on live "Pecten" shells. Obviously this provides a way that the sessile adult brachiopod could extend their geographic range.

The diversity of brachiopods was greatest near the seaward edge of the Ross Sea Shelf where two different water masses are supposed to meet. This appears to be a good marine example of the ecotone effect that is commonly noted on land. The ecotone effect occurs where two different environments meet. Often this ecotone has a greater variety of species than either of the contiguous environments alone. For example, most bird watchers know that you can see more species where say a field meets the woods than out on the field or in the woods.

Niche. --- Since most brachiopods are believed to feed in essentially the same way on minute organisms and/or dissolved organic matter, you would not expect to find more than one species in the same location. For competition would presumably drive out other less well adapted species. This is often called Gause's Principle or the Competitive Exclusion Principle which says essentially that only one species can live in the same niche (have the same way of life) in the same place. The brachiopods seem to follow this principle. Wherever a species reaches large size and numbers it is by itself--and conversely a great diversity at one spot only occurs when they are all small and in small numbers (not flourishing). However there are spots where two species seem to be flourishing together. Where that occurs, the two are normally very different in morphology. For example, Magellania fragilis occurs regularly with Macandrevia vanhoeffeni. They have distinctly different musculature and pedicle foramina (one round - the other slot-like). This suggests that some brachiopods may have different niches (that is they feed or move differently) and hence can flouish together. Thus, in fossil samples, where many different species of the same genus are reported together in large numbers at the same horizon, the species taxonomy may be suspect.

(Summer issue will conclude IN PURSUIT OF THE ICY BRACHIOPOD)

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Now normally what I do at this point is get out a reference book of some sort and find a or some gems of wisdom to pass on. That can take a large amount of time.

Today I'm going to hunt fossils. Gil and Jim and Bob will be here in less than an hour and we'll pick up Peg and go find something Ordovician.

Next month I promise not to leave any holes.

Take care and I love you

Madelynne

PS I didn't have time to proofread, either. I've been at it since 4:30 a.m., and that's a fact. I always take the coffee so I have to go.

PLEASE UPDATE THE FOLLOWING IN YOUR MEMBERSHIP DIRECTORY:

Carlos, Martha, Sara, Rebecca Bazan 310 Tamworth San Antonio, TX 78213 512-366-2377	Radiologist. Collecting 10 years. Will trade. Interested in arthropods and echinoderms especially echinoids and trilobites.
John, Kathy & Kristan Catalani	Change to Will Trade.
Dan Cooper	phone 513-829-4662
F. O. and Joan Crane 1603 Twilight Ridge Austin, TX 78746 512-327-4005	Page 4 Yellow Section -- Paleo Societies-- Austin Paleo Society--delete Frank Crane, Dallas Texas, add F. O. Cranewith address at left.
Don Bissett	phone 513-863-7471
David Batsell	Interested in Vertebera
Ray Fairbank	4128 Nobis Drive, Davenport, IA 52802
Stuart Grieve	P.O. Box 327, St. Augustine, IL 61479 -- 309-465-3215
Mark Johnson	6725 #5 Schroeder Rd., Madison, WI 53711
Robert & Sue Howell	2531 S. Pennsylvania St., Indianapolis, IN 46225
John Iellamo	228 Livingston Rd., Scarboro, Ont. CANADA M1E 1L7 Phone 416-267-9627
Jon Kramer	324 Halsey St., Duluth, MN 55803
Charles E. Straub	4084 S. Sr 100, Tiffin, OH 44883

PLEASE ADD THE FOLLOWING TO YOUR MEMBERSHIP LIST

Vincent Fiume 107 rue El'Va B4430 Alleur (liege) BELGIUM	Teacher of earth sciences. Will trade. Major interest Echinoderms (systematique) and all fossils (esthetique)--not micro. For trade: Maastrichian (Hemipneuste (Echinoid), Callianassa (crab), Neithea (Mollusc); Pliocene (Oxyrhina (teeth) Wants to exchange with USA.
John D. Berry Perry, MO 63462 314-565-3120	Dragline operator. Will trade. Collecting 10 years. Likes all fossils. Has some brachiopods for trade.
David Dilcher, Professor Dept. of Biology Indiana University Bloomington, IN 47405 812-335-9455	Will Trade. Collecting 25 years. Major interest paleobotony--plant fossils (esp. Mesozoic - Cenozoic) Desires to meet others interested in fossil plants.
Perry L. Garner, Jr. RR#3, Box 286 Albion, IL 62806 618-446-5204	Supervisor-Production Planning & Inventory Control Will trade. Major interest plant fossils Loves fossils.

Marie Huizing
5341 Thrasher Drive
Cinti, OH 45247
513-574-7142

Managing Editor ROCKS AND MINERALS. Will not trade Wants to keep current with what's being published on fossils.

Harry T. Miller, Jr.
150 S.W. 96th Lane
Ocala, FL 32674
904-237-1909

Paleopreparator. Will trade. Interested vertebrate fossils; repairs/restoration, stabilization/articulation for display; custom stands; Florida vertebrate microfossils. Has for trade: Miocene shark teeth (med - large), Mammoth teeth, vertebrate microfossils in bulk (washed but unsorted), and other specimens from time-to-time. Wants to make new contacts with amateur paleontologists.

Michael G. Murphy
2228 East 46th Street
Odessa, TX 79762
915-362-4599

Chemist (Technical representative). Will trade. Major interest Cambrian, Mississippian, Pennsylvanian, Permian, Jurassic and Cretaceous invertebrates (esp. ammonites, echinoids, trilobites, crinoids). Wants to become member because of fossil specialization and desire for contact with other amateur and professional paleontologists.

Ed Noble
8205 Medill
El Cajon, CA 92021

Math teacher, pianist & organist. Will trade. Major interest cephalopods, secondary trilobites. For trade Triassic ammonoids, Middle Cambrian trilobites and misc. Enjoys association with fossil collectors having common interest.

Larry Oliveria
35000 Mitty Avenue
San Jose, CA 95129
408-252-6611

Teacher - biology, chemistry, comp. science--Dept. Head. Will trade. Major interest cephalopods, trilobites, echinoderms. Has for trade quite a bit of Cenozoid materialIn-and-vertebrates. Wants to become a member becaus trading aspects are interesting as well as the Digest.

David K. Sivill
719-22nd Street
Rock Island, IL 61201
309-795-0417

Custodian. Will trade. Collecting 3 years. Major interest plant fossils (preferably Pennsylvanian), vertabrates (preferably Oligocene. Everything in general. Has Pennsylvanian plant fossils, Devonian invertebrates. Is a Geology major at Augustana College and very interested in paleontology.

Martin W. Tillett
2410 Fairview Drive
Alexandria, VA 22306
703-660-6137

School teacher/Naturalist (seasonal, summers) Will trade. Major interest using fossils as a means of instruction. Development of a fossil curriculum utilizing Maryland Coastal Plain fossils for the school system. Has for trade Tertiary and Cretaceous marine fossils, some Jurassic ammonites, some marine Cretaceous fossils, tertiary microfossils. Wants contacts with other people in different regions of U.S. Would show nearby localities to Washington D.C. (Ed. note ammonites are from H--tzmadden Germany)

Roger D. Williams
736 Kensington Lane
Mansfield, TX 76063
817-473-0837

Pharmaceuticals. Will trade. Major interest vertebrate & invertebrate paleontology. Just starting collection. Amateur with a Great Desire to Learn (Ed. comment--you have come to the right place--welcome) Wants to become a member because has a great eagerness to learn all he can about the science of paleontology.

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: January 1 through December 31 is $7.00 per household.

MAPS meetings are held on the 1st Saturday of each month (2nd Saturday if inclement weather). September, October, May, June and July meetings are scheduled field trips. The August meeting is in conjunction with the Bedford, Indiana Swap. November through April meetings are scheduled for 2 p.m. in the Science Building, Augustana College, Rock Island, Illinois. One annual Internation Fossil Exposition is held in the Spring.

MAPS official publication, MAPS DIGEST, is published 9 months of the year--October through June.

President:	Peggy Wallace, 290 So. Grandview, Dubuque, IA 52001
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Secretary:	Mary Wells 2033 Lillie Avenue, Davenport, IA 52804
Treasurer:	Allyn Adams, 612 W. 51st Street, Davenport, IA 52806

CYATHOCRINITES

FIRST CLASS MAIL

MID-AMERICA PALEONTOLOGY SOCIETY

Mrs. Madelynne M. Lillybeck
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1039 - 33rd St. Ct.
Moline, IL 61265

Dated Material - Meeting Notice