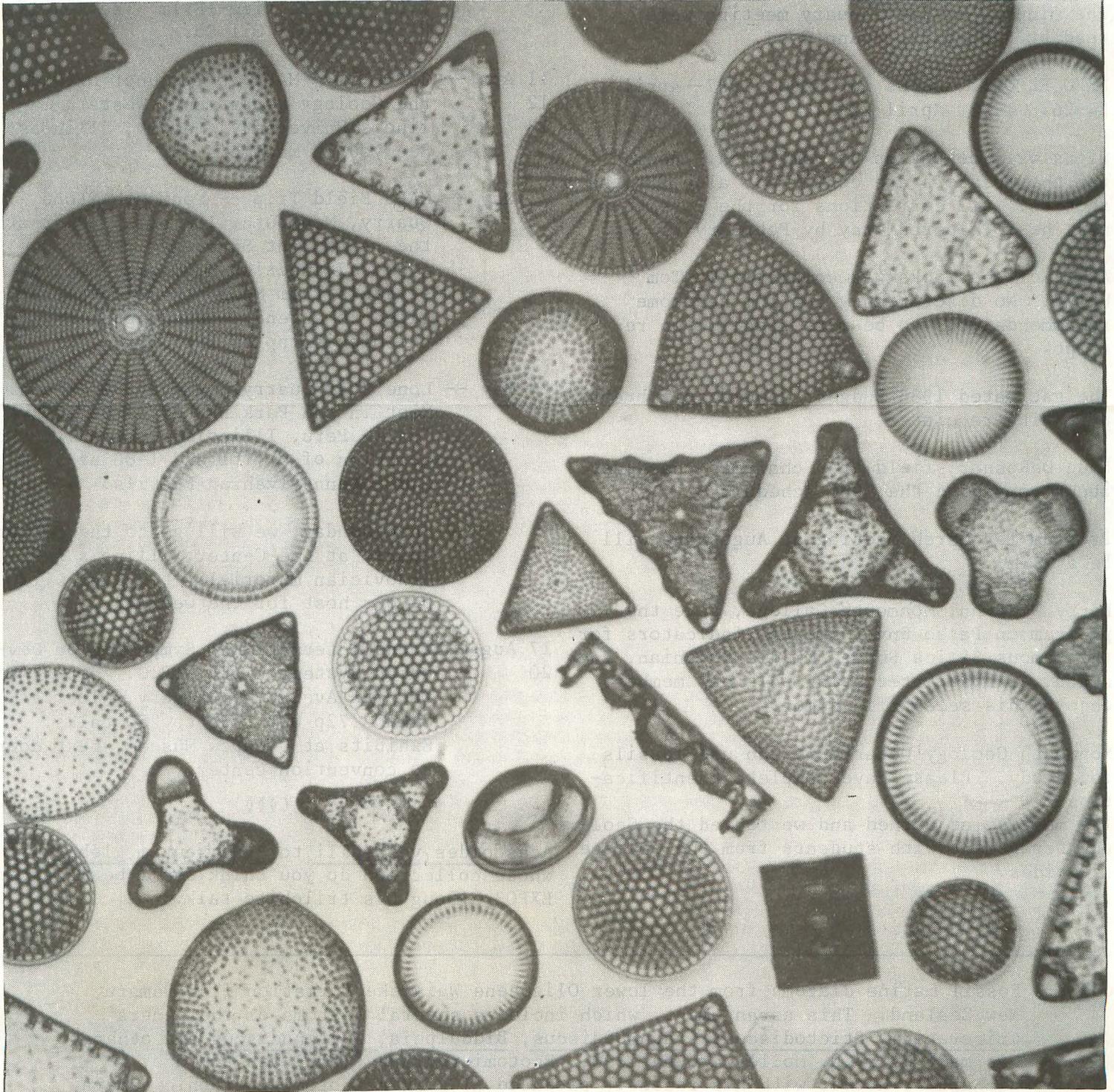


M.A.P.S. *Digest*

Official Publication of
Mid-America Paleontology Society

Volume 9 Number 3
March, 1986



SECRETARY'S REPORT

MAPS February, 1986, Meeting, Monmouth College. The meeting was called to order by President Karl Stuekerjuergen. 21 members and visitors introduced themselves.

The Treasure's Report was read stating a balance of \$2,891.63. Motion to accept the report was made by Gerry Norris and seconded by Tom Walsh.

The minutes of the January meeting were read by Secretary, JoAnn Good.

EXPO REPORT: Dates for EXPO, 1987--April 24-26. 1988, April 22-24.

Signs will be put up by Tom Walsh. Rooms for the speakers are confirmed, also for the auction. All corrections for the Directory must be to Alberta Cray by February 15.

Audit of the books was completed by Tom Walsh. No discrepantcy but Tom had some recommendations to be more specific on receipts.

The estimated 1986 Budget should just break even with receipts.

Doug DeRosear, field trip chairman, has just about completed the 1986 schedule.

Program for March Meeting at Augustana will be a film.

Larry Wiedman, Monmouth College, gave the program on Paleo Environmental Indicators for the famous Silica Shale, Middle Devonian, Indiana. A most interesting talk and members enjoyed his scientific humor.

Monmouth Geology Department can use fossils for study. Please have complete identification.

The meeting adjourned and we toured the Geology Department with students from the college as guides.

Refreshments of hot cider, coffee, and cookies were served.

Respectfully submitted
JoAnn Good, Secretary

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MARK YOUR CALENDARS

- 1 Mar -- MAPS Meeting -- Augustana College Fryxell Museum, Rock Island, Illinois
1:00 Board Meeting
2:00 MAPS Meeting--Film The Fossil Record, Shell Oil Co.
- 11 Apr -- EXPO VIII--MAPS in Conjunction with
12 the Geology Department, Western Illinois University, Macomb, Illinois
13 See you in Macomb
- 3 May -- MAPS Field Trip -- Monmouth Stone Quarry, Monmouth, Illinois. Meet at the restaurant SE corner of Hwy 34 & Hwy 67 junction 9:00 am. Geology students from Monmouth College invited to attend. Burlington Fm of the Mississippian Period
- 24 May -- Lone Star Quarry, Oglesby, Illinois.
25 Meet in the Parking Lot of Holiday Inn in Peru, Illinois, located at the junction of Hwy 51 and I-80 at 9:00 a.m. Pennsylvanian Fossils.
- Then Sunday, we will go to the Butler Quarry at Lee Center, Illinois for Ordovician material. Lew Kehr will be our host for the weekend.
- 17 Aug-- Second International Symposium on Devonian System, c/o C.S.P.G. #505,
20 206 7th Ave. S.W. Calgary, Alberta CANADA T2P 0W7. Up to 250 talks. Exhibits at Glenbow Museum, next door to convention center.

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Acastoides verneulli to Fragiscutum glebalis whose collection do you think we'll be in after EXPO? (Doug D's trilobite talk.)

COVER: Fossil marine diatoms from the lower Oligocene Waiareka Formation from Oamaru, New Zealand. This arrangement, which includes several diatoms of the genera Triceratium, Stictodiscus, Arachnoidiscus, Biddulphia, Coscinodiscus and others was made by J. D. Moller around 1890. Photomicrograph (450X) was taken by Richard B. Hoover with his recently patented MICROMEGA photomicrographic camera system.

CORRECTIONS

Vol 9, Number 2--February, 1986--Crinoids From Brock and Kickapoo Falls, Wm. T. Watkins, P. 5 first line--change Consolidated to Consolation From Mr. Watkins ". . . That is probably correct but . . . the data from Doctors Raymond Moore and F. B. Plummer's 1940 publication entitled "CRINOIDS FROM THE UPPER CARBONIFEROUS AND PERMIAN STRATA OF TEXAS" in U. of Texas Publication #3945, Page 400. So it had been in publication as I wrote it for 46 years." (Editor's Comment: I grew up in rural Kansas where we had consolidated schools. I very nearly called Texas about that word, instead I changed it. I guess if it's been that way for 46 years, a few more won't matter.)

* * *

Also, Labeling Curating Documenting Your Collection, Dr. Horowitz, P. 9-- Last line 2nd paragraph should read "two inches to the mile"

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DON'T FORGET YOUR DUES

If you have been procrastinating, this is the last Digest. Send \$10 payable to MAPS to Marvin Houg, 3330 44th St. N.E., Cedar Rapids, IA 52402.

EXPO VIII

The new Membership Directory is coming along. Most of the articles are in for the Trilobite Expo Edition of the Digest. Reservations are pouring in for tables and display space. The groundwork is progressing on schedule.

What's in store for you? A gathering of extraordinary people. Of course there will be awesome fossils. Every kind imaginable. Bring your treasures to trade and share.

A technical focus this year will be on trilobites. Dr. R. A. Robison, Professor, University of Kansas, Editor of THE TREATISE. is the keynote speaker, Friday evening after the floor closes. Dr. Mikiluc, Illinois State Geological Society will give a presentation Saturday a.m. Frederick Collier, Collections Manager, Department of Paleobiology, National Museum of Natural History, whom we have come to respect and love, will bring a trilobite display from the National Museum and teach us Saturday afternoon. These speakers will be

introduced by Lloyd Gunther who could very easily make a presentation of his own. Tom Johnson will be giving a floor demonstration on cleaning techniques.

What can you do? EXPO would not be an EXPO without your breathtaking displays. They have an on-going appreciative, awed audience. Just because it is the Year of the Trilobite, displays need not be only trilobites.

Those cases are probably the greatest gift at the show. There is no judging, they are simply for your information and pleasure, to whet your curiosity, to cause you to question, and to provide windows into the ancient ages.

The other gift one can give is a fossil for the auction. Make certain everything is carefully identified and be certain to include your own name.

Don't forget your banquet tickets. Reservations need to be made BEFORE EXPO. The food is good, the conversation scintillating and the people are special.

It's three days packed with learning, fun, fossils, friends. It's a very special holiday! It's 7 weeks, 4 days, 1 hour and 5 minutes before the floor opens as of this typing. It's exciting!!

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A D V E R T I S I N G S E C T I O N

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AN INVITATION

If you are coming to EXPO from the West, you are invited to stop Thursday afternoon and evening for a light supper and terrific socializing at 1039 - 33rd St. Ct., Moline. Please let me know in advance so I do not run out of potatoe salad. Let the fun begin!

invaluable

HOG'S EYELASHES, TIGER WHISKERS AND DIATOMS

prepared for MAPS DIGEST

Richard B. Hoover
by Space Science Laboratory
NASA-Marshall Space Flight Center
Huntsville, Alabama 35812

The cover of this issue of the MAPS DIGEST features a beautiful arrangement of fossil marine diatoms from Oamaru, New Zealand. Since the diatoms shown in this picture range from around a few thousandths to a few hundredths of an inch in diameter, many may wonder how it is possible to prepare such a precise arrangement with these tiny fossils. Man's study and knowledge of diatoms began almost concurrently with the invention of the microscope. These minute unicellular or colonial golden brown algae were actually discovered growing attached to duckweed by Antonii van Leeuwenhoek around 1700, using one of his first microscopes.

For almost 150 years, diatoms were studied by simply strewing them over thin mica sheets which were then placed under the microscope objective. The original collection of the Reverend William Smith (a famous British diatomist) is preserved in this way. Many of the diatoms on these mica sheets were the first discovered representatives of new genera and species of these plants. This extremely valuable scientific collection resides in the Henri Van Heurck Museum, Antwerp, Belgium and is described in detail in my book TYPES du SYNOPSIS OF BRITISH DIATOMACEAE: INVENTORY OF THE ORIGINAL COLLECTION OF THE REVEREND WILLIAM SMITH; published jointly by the Royal Zoological Society of Antwerp and the Royal Albert I Library. In order to isolate any particular diatom being described, the Reverend Smith would place a small ink circle around the type specimen, if there were other diatoms on the slide that could result in confusion.

Glass microscope slides appeared around 1850, and diatomists soon began mounting their precious specimens on glass rather than mica. They were mounted as strews made by simply placing a drop of water containing the diatoms on the glass slide and heating the slide to drive off the water. Sometimes the heating would be continued until the organic matter of the diatoms was oxidized to a fine grey ash, leaving only the silica shells. Diatoms can also be cleaned by treating them with concentrated hydrogen peroxide, or acids to remove the organic material without destroying the intricate shells (called frustules) which form the basis for diatom taxonomy. A mounting medium, such as canada balsam, would then be placed on the slide on top of the cleaned diatoms and covered with a thin cover glass. (Diatomists usually use mountants such as styrax, hyrax, maphrax or Arochlor resins which have a significantly higher index of refraction than balsam.) The slide would be re-heated to drive off the

solvent from the mountant which would then become rock solid when the slide was allowed to cool. This results in a strew slide, which may contain hundreds or thousands of diatom shells on the same slide. If a new species was discovered on the slide, it could be marked by recording its position with respect to scales also mounted on the edge of the slide (called a finder) or by placing a small circular ring around the diatom. Some modern diatomists still follow this practice, using diamond scribes to score a small circle into the cover slip around a diatom belonging to a new genus or species.

Sometime between 1860 and 1870, diatomists discovered that it was possible to pick up a single diatom shell and mount it on a slide. A fine bristle mounted on a slender rod was used in the rock steady hands of these early workers. The bristle would be touched to the shell of interest, which would adhere to it largely by electrostatic attraction. The diatom could then be transferred to a different slide where it could be mounted singly, or with a few other carefully selected specimens. The ability to place a single diatom in the center of a small circle on the slide was of great scientific value, as the diatom could be easily found and there could be no mistake about the particular diatom being named and described. Most of the type specimens (i.e. those which form the scientific basis for the genus or the species) produced by scientists such as Van Heurck, Weissflog, etc. are preserved as carefully prepared single center mounts.

It was also scientifically valuable to prepare mounts with many diatoms carefully laid down in rows and columns, so that all known genera and species from a given locality could be displayed on a single slide, for example. This fine art was pioneered by J. D. Moller of Wedel-in-Holstein, Germany and he called these orderly preparations

Typenplatten. On occasions, Moler would mount the diatoms on special microscope slides that he had prepared with a micro-photograph of the diatom genus and species recorded below each diatom in such fine print that it could only be read when the slide was examined under the microscope. Sometimes he mounted the diatoms in beautiful artistic arrangements, either alone or together with other microfossils. This magnificent expression of micro-art was also carried on by his student, Edward Thum, and by E. Weissflog of Dresden, and J. Dalton of London, who created exquisite paintings of floral arrangements, lizards, chickens, butterflies, hummingbirds, etc. using diatoms and the scales from the wings of brilliantly colored butterflies. These old masters clearly recognized the importance of having a very fine bristle for mounting diatoms and these other minute and delicate structures. The bristle must taper to a fine point and be resilient so as not to damage the delicate shells or scales during the picking and mounting process. Many hairs and fibers from animals as well as plants (i.e. cactus spines, etc.) were tried and tested. From my studies in the Henri Van Heurck Museum in Antwerp, I am certain that J. D. Moller used hog's eyelashes for his bristles. In fact several dried eyelids still containing the hog's lashes are on display with Moller's mounting equipment in the museum.

Several early masters extolled the virtues of whisker's selected from a young tiger. While at the Antwerp Zoo, I had the good fortune to obtain a few whiskers plucked from a slightly displeased tiger cub at my request. I found that these do indeed make superb diatom mounting bristles, but they are not easily obtained. I have also discovered that the bristles from a hog's ear are also superb, being of only slightly lower quality than the lash. However, they are very easy to obtain, since the hair from a hog's ear is used to make fine "camel's" hair artists brushes rather than anything obtained from the animal which was designed by a committee. Unless I am attempting to mount the most minute of diatoms (less than 0.001 inch in diameter) these bristles work fine if carefully selected from the brush. Indeed, my diatom arrangement which is now on display in the Fossils and Man exhibition at the Smithsonian Institution Museum of Natural History in Washington was prepared with just such a bristle. For very minute forms, which are really the specialty of Al Mayhood in California, the bristle should taper to an extremely fine point and may have to be physically sharpened. Some of the finest mounters of this century, men

like A. L. Brigger, G. Dallas Hanna, and H. Adler of California, R. I. Firth of England have also used fine glass fibers. I have tried these but prefer the natural fibers which are more resilient and less harsh on some of the more delicate and lightly silicified diatoms.

When a few chosen diatoms are mounted on a slide the result is referred to as a selected mount. Since the diatoms of a selected mount may be placed anywhere within the confines of the cover slip, usually a 0.5 to 0.9 inch diameter circle, far less precision is needed on the part of the mounter than a single center mount. In the single center mount, typically one or more diatoms of the same species are mounted within a small (0.1") circular area precisely in the center of the cover slip. Even greater skill is shown on the part of the mounter if two diatom shells are laid down so as to show the same species in both valve (top) view and girdle (side) view. And of course precision arrangements involving several hundred or thousands of diatoms can only be achieved by an expert exercising great skill and patience.

Clearly, the problem is not simply one of placing the diatoms on the slide, but it is also necessary to get them to remain in their precise locations while the other operations of heating the mountant and laying the cover slip on the slide are accomplished. Prior to 1875 diatomists had discovered how to accomplish this task by means of an adhesive called a fixative. Fixatives were made by dissolving a substance such as gum tragacanth in water or gelatin in acetic acid. A small drop of the fixative is placed in the center of a very clean microscope slide and smoothed into a thin film with a clean finger or a glass rod, such as the type found in an iodine bottle. After the fixative has been allowed to dry in a dust free area, the slide is then placed on a turntable called a ringing table.

Ringin tables used to be available from virtually every good supplier of microscopes (prior to 1940) but they are now very hard to find. I bought my own at a used microscope shop in London about 15 years ago and I treasure it very much. With the slide centered on the ringin table, the turntable is spun by hand and one or several small concentric rings in jet black india ink are laid down on the fixative film. The prepared slides are then stored in a dust free container until wanted for use. They will keep for a long

time if protected from dust. The concentric rings form a bullseye surrounding the region where the diatoms are to be mounted permanently. In making a single center mount, I have found it convenient to first pick interesting and perfect diatoms from a strew and to lay these selected diatoms onto the surface of a clean cover slip. This cover slip can be temporarily held to the top of the slide with the strew by adhering it with a tiny droplet of water. After picking a group of fine diatoms, I then transfer the temporary storage cover to one of my prepared (ringed) slides and re-adhere it with another water droplet. This double picking operation permits finer results which are free of unwanted stray diatoms or pieces.

To pick up the diatoms, I use a specially designed micromanipulator of my own invention. As I rotate the rod of the micromanipulator, a fine bristle is moved down to touch the selected diatom, which is then lifted up on the bristle as the pressure is relaxed. The mechanical stage of the microscope is moved until the center of the concentric circles is under the bristle and the diatom is lowered into place. If the diatom is not in the exact position desired, the point of the bristle (hog's eyelash) is used to push the diatom to and fro until the perfect position is obtained. Once in position, I lean over and exhale my breath gently upon the slide. The fixative, rapidly absorbs the moisture from my breath and melts, allowing the diatom to sink into the thin film. Within seconds, the moisture re-evaporates and the fixative again becomes solid, tightly holding the diatom in place. Testing is done by applying gentle pressure with the bristle. If the diatom moves, the process is repeated. However, if the bristle is seen to bend as force is applied to the diatom, it is solidly fixed in place and will probably be able to withstand the currents and bubbles that try to move it about as the mountant is heated in the next stages of mounting. If the bristle is too strong, as with some glass fibers, it is possible to damage the diatom by applying too much force in this step. Fine tiger whiskers or hog lashes will almost always bend easily without damaging the diatom.

The fine art of mounting diatoms reached its peak in the latter part of the last century. The greatest mounter to ever live was unquestionably J. D. Moller. Between 1870 and 1890, Moller made hundreds of intricate mounts with the diatoms laid out in precise rows and column (Typen-platten) and intricate artistic arrangements.

In his great Typen-platten, Moller set out to display in an orderly fashion all known species from selected classic fossil localities, such as Oamaru, New Zealand; Santa Maria, California; Nottingham, MD; Simbersk, Russia; etc. A color photomicrograph of Moller's magnificent typen-platten from the Eocene deposit in Jeremie, Haiti is shown on page 879 of my NATIONAL GEOGRAPHIC article: "Those Marvelous Myriad Diatoms," June, 1979. When Moller completed these magnificent typen-platten, he adorned them with engraved labels of solid Ivory.

In 1875, Moller undertook to produce a single slide upon which were mounted all known species of diatoms of the world. He worked on this project from 1875 to 1890, carefully selecting and storing perfect representatives of diatom species from all over the world. He prepared a precise plan for the layout of the diatoms; all species of each genus would be grouped in perfect rows and columns. Then in early 1890, Moller began the meticulous task of laying down the diatoms. For forty days and nights he labored with this task, wherein the slightest error could have resulted in the destruction of the magnificent order being created. Finally, in April of 1890 the last diatom was locked into place in the fixative and Moller was ready to seal the masterpiece with the mountant and cover slip. This creation consisted of 4,096 different species arranged systematically in perfect rows and columns comprising nine panels lying within a 6.0 mm X 6.7 mm area. (Ed. com. 25.4 mm - 1 inch) In selecting a mountant, Moller chose a mixture of Canada balsam and monobromide of maphthalein, which yielded a mountant of extremely high index of refraction to show off the diatoms with superb contrast. After the cover was in place, the precious slide was encased in a specially prepared block of ebonite and adorned with engraved Ivory labels bearing the inscription UNIVERSUM DIATOMACEARUM MOLLERIANUM. In 1904, Moller exhibited this masterpiece at the St. Louis World's Fair. Many tried to buy the slide, but Moller's price of 40,000 golden marks, enough to buy a villa on the Riviera, was prohibitive.

Then, shortly before his death in 1907, Moller noticed that the mountant was starting to creep and move some of the diatoms about. He was distraught with grief. Moller offered to sell for 6,000 golden marks his Grand

Microscope and his entire diatom collection including the UNIVERSUM to his dear friend Henri Van Heurck. Van Heurck purchased the collection and set about to repair the greatest diatom masterpiece of all time. Some eight months after selling his beloved diatom collection, Johann Diedrich Moller succumbed to illness and died at the age of sixty three. But he lived long enough to see his masterpiece saved.

When Moller turned over the UNIVERSUM to Van Heurck, he lamented that it was deteriorating but that he had neither the strength nor the courage to try to repair it. Exhibiting colossal courage, Henri Van Heurck undertook the task of removing the cover and dissolving away the mountant, an effort which could easily have resulted in the total destruction of this unique slide. He then successfully remounted the slide in styrax, a stable mountant of his own invention. While at the Van Heurck Museum in Antwerp, I had the opportunity to spend an entire day with this glorious slide. With the exception of the 35 diatoms that had altered position prior to the time Van Heurck received the slide, this work is still as perfect as it was when Moller laid down the last diatom on that fine day in the early spring of 1890. And the UNIVERSUM remains to this day the greatest artistic masterpiece ever painted with the hands of a genius precisely manipulating these tiny wonders of nature with the aid of a delicate hog's eyelash.

(Editor Comment: Unbelievable! Richard Hoover is a man who oozes energy. His mind works exponentially to the movements of his body and his speech. One of his slides under microscope shows a beautiful diatom which sparkles and looks like a diamond. To the naked eye a skew of diatoms looks like dust. Under power, they are exactly what he calls them-- little gems. Thank you, Richard.)

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COLLECTING MICROFOSSILS -- Copyright

Dr. N. Gary Lane
Department of Geology
Indiana University
1005 East 6th Street
Bloomington, Indiana 47405

What is it that appeals to you about fossil collecting? How big the fossil is? Its rarity? How much it is worth? Its attractiveness? If you answer yes to most of these questions then microfossils are probably not for you. They are, of course, all very small. Some may be quite rare. They aren't worth much although

some have complex and elegant skeletons. There are more professional paleontologists who study microfossils than there are those who study larger fossils, principally because of their economic value. Microfossils can be obtained at many rock outcroppings where larger fossils are rare or absent. They are used in the oil industry and elsewhere to match up or correlate rocks in time. They are small enough that they can be obtained from the small pieces or chips of ground up rocks that come up in drilling for oil or gas. They are being extensively utilized in the deep sea drilling projects of the Glomar Challenger.

There is a tremendously wide variety of microfossils. Both plants and animals are involved as well as single-celled organisms. Some microfossils are the entire skeleton of the organism, others consist of parts of a whole skeleton that has fallen apart. Some are so small that they cannot be seen directly with a light microscope but must be studied with an electron microscope. In all cases some special equipment is needed and an investment in such equipment is necessary if you are to be a successful microfossil collector. They don't take up much room and if you are lucky enough to find very rare kinds of microfossils, you can be sure that paleontologists will seek you out.

A Microscope For Microfossil Collecting

The one essential item needed for collecting and studying microfossils is a microscope. A hand lens or magnifying glass simply does not provide enough magnification to be effective. A good student microscope need not cost too much money, a new one for about \$200 can be purchased. There are several things that such a microscope should or should not have. First, it should be binocular, with an eyepiece for each eye. A single tube, monocular, microscope is very tiring to use and hard on your eyes if not used correctly. The binocular scopes also provide 3-D, stereoscopic vision so that you can see the fossils in the round. Monocular scopes provide only a flat field of view.

The scope should be usable both with transmitted and reflected light. That is, you can view both opaque objects and can also pass light through a transparent object that might be mounted on a glass slide. Most binocular scopes have both capabilities.

The oculars or eyepieces may be removable, so that different magnification powers can be used, or they may be fixed in place. One eyepiece may be adjustable to take account of different eye strengths or this feature may be lacking. You should always use the scope without eyeglasses and let the lenses of the microscope make adjustments for your eyes. Finally the oculars should be adjustable for distance between your eyes, known as the interpupillary distance. For most people this distance is between 6 and 7 centimeters.

The microscope should have more than one objective, the lens at the base of the microscope tube. The powers of the lenses in the oculars and in the objectives multiplied give the total magnification of the microscope. Thus, 5X or 5 power eyepieces and a 10X objective combine to provide a total magnification of 50X (X stands for times). Total powers of from 10X to 50X are most suitable for most microfossil collecting. A scope that can be used at X15 and X30 is satisfactory, for instance. Some magnifications between, say, 10 and 40. Others have fixed objectives that must be rotated or slid forward or backward to provide different magnifications.

The viewing stage may or may not have clips to hold slides in place. There should be a hole in the center of the stage so that light can be passed through the stage and a glass slide mounted on the stage (transmitted light). An adjustable mirror under the stage focuses light up into the barrel of the scope. The entire scope may be tiltable to provide comfort in viewing. There may be a built-in light source or you may have to purchase an external light source. There may or may not be a carrying box for storage and transport. Most scopes come with a plastic dust cover that is left on the microscope when not in use.

All of these features mentioned above are kind of like the various accessories that you can get on an automobile. The more you get the more you pay, and how essential are they? Each person pretty well has to decide on these options themselves. What is your budget? How many hours a week do you think you will use the scope? What condition are your eyes in? All of these factors come into play. You should definitely try out a microscope before putting cash for it. Buying a used scope can be very tricky--just like a used car. Commonly the optics of old scopes are inferior, out of line, and not clear around the edges of the viewing field. Among low-priced new student microscopes--

the kind we buy for use in undergraduate paleontology laboratories--American Optical puts out some microscopes that are surprisingly low priced for their quality. These scopes will not have all of the features listed above by any means--or if you buy a scope with most such features you will pay quite a bit more. Some research microscopes that are used to study and take pictures of rock sections in polarized light may cost as much as \$30,000. So if you can get a useful microscope for your hobby for \$200, it is quite a bargain.

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LABELING - CURATING - DOCUMENTING YOUR COLLECTION

Information A Label Should Contain: Geologic Information

In museum paleontological collections the rock unit is referred to stratigraphic position, which contains the name of the unit and its geologic age in terms of a system developed in the last century and now used as an international standard.

Within geology, the study of rock sequences is called stratigraphy. The procedures for documenting and ranking rock (stratigraphic) units are part of a North American stratigraphic code created jointly by North American governmental geological surveys and agencies and by independent geological associations and societies. This code is followed by most geologists. The finest rock units usually recognized are beds. Groups of beds constitute most of the higher ranks of recognized units (members, formations, groups), which may or may not be subdivided. Members typically are grouped into formations and formations are combined into groups.

The geologic system of naming rock units is much more arbitrary than the systems of geographic coordinates. Geologists typically define rock units based on the kind or kinds of rock included and they name the unit from some nearby geographic feature, commonly a town. For example, the Salem Limestone of Indiana is named for exposures in and around Salem, Washington County, Indiana. Priority typically determines usage when more than one name has been applied to a rock unit. The term Bedford also had been used in Indiana for the Salem Limestone, but the name Bedford had been applied first to unrelated

rocks in Ohio so that Salem was proposed as a replacement name.

Collectors usually learn rock unit names from other collectors, but many state geological surveys and the United States Geological Survey keep formal lists of names they recognize for use on their geologic maps and in their geologic reports. Consequently, collectors usually can obtain information on rock names from the appropriate local geological survey.

In museum paleontological collections the rock unit is referred to a stratigraphic position, which contains the name of the unit and its geologic age in terms of the geologic time scale.

Fully documented labels contain the name and date of the collector and of the identifier of the fossils.

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WANTED -- PALEOZOIC PELECYPODS

Last year at EXPO, Jim Konecny discovered Museum Director Dr. Jack Bailey, Geology Department, Western Illinois University, Macomb, Illinois, is doing research on Paleozoic Pelecypods.

In your sorting of fossils to display, swap, sell or just to organize, as you make preparations for EXPO, perhaps you would keep Dr. Bailey in mind.

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FIRST INTERNATIONAL SYMPOSIUM ON DINOSAUR TRACKS AND TRACES

The purpose of this symposium is to bring together experts to present research reports and discuss paleoecological and paleoenvironmental implications of dinosaur ichnology.

Symposium: May 23-24, 1986, New Mexico Museum of Natural History, Albuquerque, New Mexico

Field Trip: May 25-30 Triassic through Cretaceous Arizona, New Mexico, Utah and Colorado.

Michael Morales, Curator of Geology, Museum of Northern Arizona, Flagstaff, AZ 86001

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Pick up your next DIGEST at EXPO!

Me And My Shadow

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- FRED T. WESSMAN 4311 Annwood Circle Spring, TX 77388 713-353-3412
- Petroleum Technician. Will trade. Major interest U. Cretaceous vertebrate Fossils. Has dinosaur vertebrate bones and teeth. Wants to trade and meet others interested in Paleontology.
- Journalist. Will trade. Major interest invertebrates Has invertebrates from Jurassic of Europe.
- Attorney-Wife & Mother. Will not trade. Major interest all types of fossils, collecting, field trips. Wants to meet other hobbyists to learn, share, and field trips.
- Free Lance Paleontologist. Will trade. Major interest trilobites of all ages. Wants to meet new people.
- Retired Farmer. Collecting 30 years. Major interest mammal and marine reptiles from S.Dakota Badlands. If someone stopped may have fossils. Former geologist with U.S. Corp of Engineers. Written many articles. It would be an honor to be a member of such a worthy society and get to know the people who share such an interest.
- Geophysicist. Will trade. Major interest trilobites. Has trilobites for trade.

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 sponsored by the Indiana Society of Paleontology, the Indiana Chapter of MAPS. November through April meetings are scheduled for 2 p.m. in the Science Building, Augustana College, Rock Island, Illinois. MAPS Annual International Fossil Exposition is held in the Spring, and a second show in the Fall, Fossilmania, is sponsored by Austin Paleontological Society, a MAPS Affiliate.

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

President: Marvin Houg, 3330 44th St. N.E., Cedar Rapids, IA 52402
 1st Vice President: Karl Stuekerjuergen, Rt. 1, West Point, IA 52656
 2nd Vice President: Jeff Nekola, 800 25th St. N.E., Cedar Rapids, IA 52402
 Secretary: Peggy Wallace, 290 So. Grandview, Dubuque, IA 52001
 Treasurer: Allyn Adams, 612 W. 51st Street, Davenport, IA 52806



CYATHOCRINITES

MID-AMERICA PALEONTOLOGY SOCIETY

Mrs. Madelynne M. Lillybeck
 MAPS DIGEST Editor
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Dated Material - Meeting Notice

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