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the

GLACIAL

DRIFTER

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The Grand Rapids Mineral Society is a Non-Profit Corporation affiliated with the Midwest Federation and the American Federation of Mineral Societies.

Meetings are held the 2nd Wednesday of each month at 8:00 P.M. at Ridgeview Junior High School, Rosewood at Burton S E (Sept. thru June). Summer meetings are at various parks as noted.

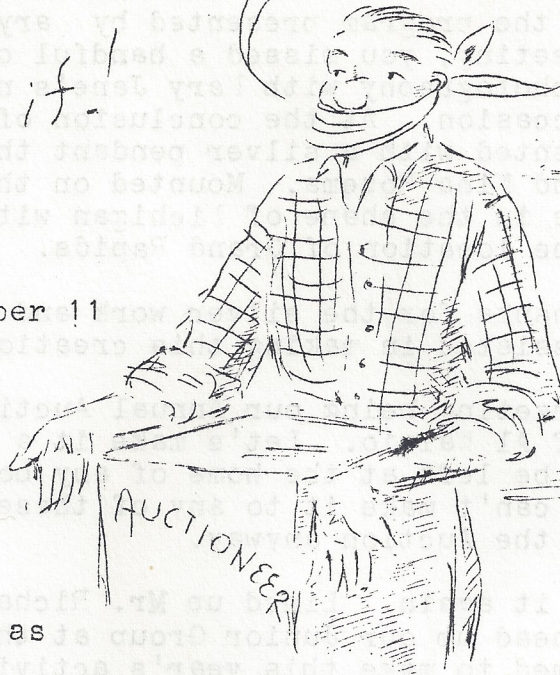
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Permission to reprint material appearing in the DRIFTER is hereby granted provided proper credit is given.

member - Bulletin Editors Association.

so... OK...  
YOU say it!



WHEN? Wednesday, November 11

What Time? 8:00 P.M.

WHERE? Ridgeview  
 Junior High School

Where's that?

Rosewood, S E at the  
 corner of Burton. Same as  
 the last two months.

What's Doin'?

### ANNUAL ROCK AUCTION

I have never served on a committee of this type before, but it is plain to see that the success of this auction depends mostly on the donations of each and every member.

Thanks to Mr & Mrs August Post and Mr & Mrs George Walker for getting their donations in so early. The sooner the donations come in the easier it will be for the members that are helping on this project. The officers and board members will help out as usual.

Keeping the tables loaded will be John Potter, Arnold Wendt, Sr. and Rich Van Peek.

Gary Damstra and Roger Waivio are junior members, and will take care of the Junior Table.

Mrs. Nina Rozema and Mrs. Lucile Pearl will take in the money and make change. These are two of the hardest workers in the club.

Mrs. Waldron, Mrs. Damstra and Mrs. Waivio will serve coffee, cookies, and cider. There will be a charge for refreshments.

Thanks to the members who are baking cookies for this event.

It will be appreciated if others will help out at the refreshment table, or wherever needed.

Thank you,

Eldon Waivio,  
 Chairman, Auction Committee

OUR PRESIDENT'S CORNER

IF you missed the program presented by Mary Jane Dockeray at the last meeting, you missed a handful of wonderful movies. Superb color photography with Mary Jane's narration made this a memorable occasion. At the conclusion of her program, Mary Jane was presented with a silver pendant that was crafted by Esther Hall and Nina Rozema. Mounted on the pendant was a Pxxxxxy stone in the shape of Michigan with a real McCoy sparkler set to mark the location of Grand Rapids.

A bucket of thanks for the silver work and to the Herkner Jewelry Company who assisted in making this creation possible.

The November meeting being our Annual Auction, is under the capable supervision of Al Waivio. Let's make it a really big show. Donations can be left at the home of any board member or at Al's home. If you can't make it to any of these drop-off places, bring your items to the Auction anyway.

Dick Rose did it again. Lined up Mr. Richard Winar, consulting geologist to head up our Junior Group at the Museum. Plans are being formed to make this year's activities unique in every respect.

This Ladies NITE deal for December is going to be a dinger!! Have a few rumbles on what might happen but don't dare mention it because it probably would be changed.

See you at the Auction.

Jerry Morris

(Editor's note: Jerry cut the Michigan for the Pendant for Mary Jane and without his part of the project there would have been nothing. So all of us wish to thank him for his assist.)

YOUR DONATIONS ARE NEEDED

As you know, the money raised at the Annual Auction keeps the wheels turning for most of the year. But in order to have a good auction financially, we must have good donations from our members. Each and every member should make a point of donating at least one item to the cause.

BUT, we also need members to bid on these items on the NIGHT. Bring a few bucks and spend them. You won't be able to get a good many of the items offered any cheaper and the money is going into YOUR club treasury to pay your club bills..

Get your donations ready and call one of the board members for a pick up - or better still take it to his or her home. Don't Delay.

CALENDAR OF EVENTS

- November 7 - Saturday - To the best of our knowledge the Junior Program at the Grand Rapids Public Museum starts this morning. All juniors are invited to participate in this program. There is a nominal charge. For further details contact the museum, please.
- November 11 - WEDNESDAY, 8:00 P.M. ANNUAL AUCTION. Regular monthly meeting, Ridgeview Junior High School, Rosewood, corner of Burton S E. Come prepared to do some bidding - as this is a silent auction you will need a pencil or pen to write your bids.
- November 16 - Board of Control Meeting at home of Mr & Mrs. Richard Damstra, 2709 Carlton N E
- November 18 - WEDNESDAY at 8:00 P.M. Mineral Study Group meeting at home of Mrs. Nellie Mead, 334 Briarwood S E  
NOTE: Change of day for this meeting.
- November 26 - Thursday - A HAPPY THANKSGIVING to all members of the Grand Rapids Mineral Society. May your turkey's gizzard stones be agates.
- December 9 - Wednesday - Regular Monthly Meeting. LADIES NIGHT. Miss Esther Hall has charge of this meeting. She needs some volunteers to assist. Please contact her immediately.
- NOVEMBER 21 - Deadline for material to appear in the December issue of the DRIFTER. We go to press before the end of the month due to the early date of our December meeting.
- NEXT MONTH in the DRIFTER; Look for an article by Richard Van Beek on a recent trip. Also, the second installment of the article on TRILOBITES, by our junior, Larry Fegel.

LUCKY DOOR PRIZE WINNERS

At the October meeting Joe Parish streamlined the door prize drawings and came up with winners in jig time style. These were the lucky ones:

- Henry Nordheim won the opal pendant donated by rozema's rockpile
- Kreigh Tomaczewski won a slab of Kona dolomite and of tigereye donated by the Potters
- Jim Molenbeek got the barite rose and hexagonaria donated by Marie Spielmaker
- Lucile Pearl - the mineral specimen from Canada given by Mr. & Mrs. Fay Reed
- Jane Potter - the Montana wood donated by Joe Parish

No door prizes at the November meeting. This meeting will be devoted to the AUCTION and only the AUCTION, but we will have some prizes to give away in December.

MINERAL STUDY GROUP MEETING.

At the October meeting of the Mineral Study Group which was held at Mrs. Lucile Pearl's home, it was decided to devote part of each of our meetings to the study of Dr. Zumberge's book on Geology.

This group's November meeting will be held on WEDNESDAY, November 18 at the home of Mrs. Nellie Mead, 334 Briarwood SE with Mrs. Fay Reed leading the discussion on the first three chapters.

YOU, and YOU, and YOU are cordially invited to meet with us.

Please note change of date for this meeting. WEDNESDAY, November 18. See you there.

\* \* \* \* \*

JERRY MORRIS WORKING WITH VILLA MARIA GIRLS

Jerry Morris has been devoting a good deal of time to the girls at Villa Maria teaching them about Petoskey stone and how to polish it. He is looking for volunteers to drive some of these girls to a collecting area about 60 miles from Grand Rapids. If you are willing to assist in this worthy cause please contact Jerry immediately so a trip can be arranged before the snow flies.

JUNIOR JOTTINGS

Hi, again!! By the time you receive this November will be upon us.

This month we are fortunate enough to have another swell article from another very capable young man, Larry Fegel. Thanks loads, Larry, for your wonderful cooperation.

We sure look forward to hearing from our junior group, they're sure bursting with information. So keep watching, you may be next to have a JOTTING appear in the DRIFTER. Thank you.

(Mrs) Marilyn Damstra

TRILOBITES (TRILOBITA) by Larry Fegel

The name trilobite is derived from its physical appearance. The trilobite has three portions to its anatomy. They are: the cephalon - head, thorax - body, and the pygidium - tail. Thus the trilobite receives its name tri meaning three and lobe meaning parts.

The cephalon contains three parts. They are the glabella and two lateral cheeks. The glabella is the center and main section of the cephalon. The lateral cheeks are divided into two groups: the free cheeks and the fixed cheeks. The fixed cheek is adjacent to the glabella. Grooves, facial sutures, separate the fixed and free cheeks. The free-cheek is the area of the cephalon from the facial suture to the exterior edge of the cephalon. An important organ in the cephalon of most trilobites were the eyes (I say most trilobites because some trilobites had no eyes).

The eyes of the trilobites were very similar to the eyes of many of our modern day insects. It was not one solid eye but a combination of many separate eyes ranging in number from fourteen eyes to fifteen thousand eyes.

The thorax or body of the first trilobites contained at least forty-four segments. Then as the trilobite progressed the number of thorax segments were reduced. Eighteen to twenty of the Olenellus down to two of the agnostids, which had an average length of .2 inches. There are two reasons for this reduction: loss, and combining with the pygidium.

When we find a trilobite we fail to realize that a trilobite once had legs and an antennae. The antennae is thought to have carried organs of taste and smell. The legs were formed in pairs under the entire length of the body. These legs maintained three functions: walking, swimming, and breathing. Some paleontologists believe the trilobite swam upside down, though they walked right side up.

(Continued next page)

JUNIOR JOTTINGS (continued)

The pygidium is the hindmost part of the thorax. It is not really a separate independent lobe, since it contains part of the intestinal canal which starts in the thorax. In the first primitive forms the pygidium was very small. As the trilobites evolved the pygidium grew in size by consuming part of the thorax.

(TRILOBITES will be continued in the December issue of the DRIFTER)

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MICHIGAN REFORMATORY VISITED BY TWO GRMS MEMBERS

In October Dr. Richard Rose and Bob Rozema went to the Reformatory at Ionia to give a program for their Science Club. The boys are very interested in rocks and minerals and eager to learn more about them.

The following is a letter received from Mr. Frank Bennett, their High School Supervisor:

October 14, 1964

"Mr. Robert Rozema  
776 Leonard N E  
Grand Rapids, Michigan

Dear Mr. Rozema:

May we express our thanks to you for accompanying Dr. Rose and aiding our Science Club on October 1, 1964. The box of identified specimens you people left for the boys to use in rock identification is being used.

We hope your visit with us was as enjoyable to you as our joy was in having you here.

Again we thank you for your time and effort taken on our behalf. We hope you will want to visit us soon.

Sincerely yours,

Frank Bennett  
High School Supervisor

Approved: Edward L. Colbert, Warden

Plans are under way to have Jerry Morris give a program on Petoskey stone polishing for this group in the near future.

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BROKEN BONES AND OTHER ASSORTED ILLS

Our members have been running into a heap of trouble in the past few months. We hope each and every one of them is well on the road to recovery by the time you read this.

Mrs. Lucille Duyser, a teacher at Ridgeview Junior High, fell in the corridor at the school the day before school started and broke her arm - this didn't keep her from being on the job the next day.

Instead of attending our September meeting Henry Nördheim was rushed to the hospital and after spending nearly two weeks there and getting several pints of blood he was allowed to go home. He is getting along fine, in fact he was at the October meeting.  
(continued next page)

BROKEN BONES (continued)

Mrs. Howard Merrick stepped back to avoid getting splashed by a wave while hunting agates along the shore of Lake Superior. She fell and not only got wet but also broke her arm. She too is getting around and attended the meeting of the Mineral Study Group in October.

Mrs. James Waldron slipped in church and has a badly sprained ankle. She is limping around home but expects to be at the November meeting.

Mrs. Peter Boogaart fell on the sidewalk at a friend's home in April injuring her knee to the extent that she had an operation on it and is just now getting around again.

Mrs. L. D. Wheelock has an operation a few weeks ago and was getting along nicely until she developed a kidney infection which took her back to the Greenville Hospital where she is still a patient at this writing.

Casey Doornbos had an operation early this summer, he got along fine after that one - but on October 14 he entered the hospital again, this time for an operation on his leg. We understand he is getting along well again.

Arnold Wendt spent some time in the hospital late this summer - in fact, they had to cut their vacation short when he was taken ill. He, too, is up and at 'em again, we are happy to say.

Mrs. Wendt injured her back and is having quite a bit of pain, but reports that she is getting along pretty well. She was at the October meeting but left early when the chair became too uncomfortable for her.

If we have heard of any others who have been on the sick list the names escape us at this writing, but we'll probably remember them just as we get ready to put this paper in the mail, which will be too late to give you a report.

Let us know if any of our members are sick or injured so we can let the whole membership know about it and give their friends in the club a chance to remember them with a card or a visit.

MAN'S GUIDE TO THE METALLIC AGE . . . by Barb Roys

Earth's crust is rich in metal-bearing rocks - ores - and veins of native metal. Copper is one of these metals, ranking along with aluminum, lead, and zinc right after iron and steel as one of the principal metals in terms of the quantity produced in the world today.

Being fairly rich in minerals ourselves here in Michigan, we have quite a collection of such natural resources as iron, copper, silver, gypsum, and others. Copper is one of these items, in our "collection" that we are rather proud of and this with due cause. We think a lot of this metal because it does not occur in a native state in very many places, only a few, - and among these locations: we are it! Not the only ones to have native copper - there are some other places where it can be found. Still, we are considered somewhat important because of the high quality of our stuff. In fact, what we have is so good, that the US Government requires a small percentage of our metal in all their defense material wherever copper is used at all.

As mentioned above, we are not the only ones to have copper as one of the important minerals of the area. In general copper is produced today in four main mining areas in the world. These are as follows:

- A. the Rocky Mountain and Great Basin area of the United States, (which includes the Butte, Montana mine, open pit mine at Bingham Canyon, Utah and the Arizona copper deposits.)
- B. the western slope of the Andes mountains in Chile and Peru (which has the great copper mining area at Chiquimata, Chile).
- C. the central plateau of Africa in the Belgian Congo and Northern Rhodesia, (with its Katanga mines) and
- D. the pre-Cambrian shield areas of Central Canada and their extension into Michigan, generally including the Lake Superior region, (and - incidentally - having our own Keweenaw peninsula mines.)

This accounts for the major producing areas. The greatest known reserve of copper ore in one body is at the above-mentioned deposit at Chiquimata, Chile. But of late the Katanga region in the African "copper country" has been coming more and more in the producing spotlight. Besides these major producing areas many less important mining areas are being used today. These are widely dispersed all over the world as for example: in Alaska, China, Cral mountains of the U.S.S.R., Australia, Europe, and various other portions of Africa and North and South America.

That much for general producing areas. As a mineral, copper occurs in nature in a very wide distribution and in some rather unusual places. At first, of course, when we think of this metal, we think of the copper-bearing ores. It is true that copper is found in  
(continued next page)

MAN'S GUIDE - (continued)

many ores - copper bearing rocks. It is likewise found in some soils as well as oceanic clays, and river silts. It appears to have some liking for the sea, as it can be found in many corals in the sea and in the ashes of seaweeds. In living creatures it can also be found in very small quantities in the human body as well as the bodies of some small lesser animals. These are certain kinds of snails and spiders. It appears to play the same role in the blue blood of these animals - notably the snails - as ferrous hemo-globin does in red-blooded animal. Finally, not content to be confined to our planet, it has even been reported as appearing in the sun.

Now, that we have surveyed briefly the widespread locations where copper can be found, let us go back briefly in the history and see the first entry of copper on the stage of man's history. Let us see how man first became acquainted with this attractive metal and the uses he has been making of copper ever since.

Since almost the dawn of history men have occupied themselves in extracting minerals from earth - Thousands of years ago - probably around 8000 B C - the Neolithic man got tired of chipping flint and decided that mere stone would no longer do for his tools and implements. He started looking around for some more suitable substitute for stone. In doing so, he discovered a hitherto overlooked substance that appeared to him to be about as hard as stone but much easier to work with. This substance, needless to say, was copper. It malleable enough for him to fashion and shape rough tools easily by beating this metal to a desired shape. At first he made merely crude hammers, axes, and knives. He did not know how to smelt copper as yet - what he was using so far were merely the occasional deposits of native copper that he had been able to find. Once he had discovered coppdr, he liked the sharp edges on his tools that he could get by using this material, and likewise he admired the attractive reddish color of the substance - it was so far superior to the dull stone knives and axes he had had to be satisfied with up them. As yet his methods were crude in working this metal. However, his interest was aroused and by decades and centuries he kept after it until - as his experience in metal working grew - other utensils besides crude weapons were added to the list. So it happened that this native metal took man out of the Stone Age and set him on his way to progress. This was the first metal that man ever tried his hand at working, but he kept at it until today he - while still working with copper - has added many other metals to his list and there is no knowing where he will stop. However, as yet for man that is very distant, un-dreamed of, future.

man liked what he had by way of his new tools, but - being a curious creature - he also thought that perhaps these tools could be improved upon in some way. A long time passed while he tried and fumbled. Then sometime around 6000 B.C. - as is believed - he discovered that this metal could be melted in a campfire and cast in whatever shape struck his fancy. As we said, he had

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MAN'S GUIDE (continued)

already made discoveries of native copper deposits and was working these. Now he could better his working methods and create even more useful tools. At last man was getting somewhere. Before long, he had discovered the relation of copper metal to copper bearing rocks and also devised some method of reducing ores to metal. It was at this point that there broke the dawn of metallic age and the birth of metallurgy took place. From here on only man's own intellect and creativity would set the limits to what he could accomplish in metal-working.

In the early copper age, probably the greatest use of this metal was made in Egypt. We have records now of weapons and tools being left in the graves for the use of the dead already as early as about 5000 B.C. Records likewise have been found of the working of copper mines in the Sinai peninsula by King Snefru about 3000 B.C. The finding of crucibles at these mines would indicate that not only was the metal being mined, but some refining process was included in this art of metal extracting. In fact, eventually the metallurgical art in Egypt was carried out to a notable degree. Not only tools and utensils were made out of copper, but delicate copper ornaments adorned the people. They even learned how to hammer copper into extremely fine sheets and use this sheet copper for the making of pipes and other objects.

At this rate copper working soon developed to its limit - at least for those days and with the tools that were then available. There just was nothing more to do. However, man's mechanical curiosity was aroused and he was determined to find new horizons in metal-working. If nothing more could be done with copper metal, and the mining and refining methods had approximately reached their workable limits, perhaps some new phase in metallurgy could be developed that had not been attempted before...A new phase?... Well, why not? Some other lesser metals had been also worked out by this time - so, why not mix them with copper and see if some better results might not be obtained by this joining? With this idea in mind it was only natural that bronze should follow as a matter of course. This alloy of copper and tin - possessing hardness and toughness far superior to copper itself - proved itself to be a great advancement over the original metal. The material was generally used for making weapons and art objects. The period of its extensive use is now known as the Bronze Age and spread out from Egypt starting before 3000 B.C. until it reached out all over the world by around 1800 B.C. Except for the Americas, copper and bronze seem to have made a steady gradual advance from place to place. Thus it was known also in Asia as early as 2500 B.C. and very beautiful bronze vessels were made in China during the Shang Dynasty - (1765-1122 B.C.).

It was only in the Americas that the discovery of copper was slow - believed to be only about 100 to 200 A.D. Once it was discovered, though, its uses were extensive - especially among the Indians of Lake Superior area where copper abounded. The appearance of bronze was not excluded, and the Indians of Central America appear to have reached quite some skill at this type of metalworking.

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MAN'S GUIDE (continued)

The discovery of iron and consequent iron-working pushed copper aside for a while to a mere ornamental usage and as material for some household utensils, though not entirely. Even in the dawn of Iron Age copper still retained its importance in places where resistance to corrosion from water was important - such as all marine uses, water pipes, etc. It is only now - in the twentieth century - that its unusual property - the ability to conduct electricity - has made it come back to considerable importance.

This brings us then to the current uses of copper in modern-day manufacture and industry. Even though in the constant competition of metals for the ability to do the best job required copper is slowly being replaced by other metals, it still ranks quite highly both because of the quantity produced and the variety of uses to which this metal can be put. More than half of copper manufacturers today are in the electrical industry. This includes anything from light bulbs through electric wires and cables on to actual electrical machinery such as electric generators, motors, locomotives; likewise switchboards, telephones, and telegraph parts in the communications end of the electric industry. Sometimes here copper is used in a pure or nearly pure state, as in copper wires that make up power cables. Quite often, however, it is used in the form of a bronze - a copper alloy. For example, cadmium bronzes have high electrical conductivity so they can be used for cables and also trolley wires. Copper chromium alloys, on the other hand, have high electrical conductivity at elevated temperatures so their use comes in in things like electrode tips in resistance welding. Around ten per cent of copper manufactures go in the transportation industry with the exclusion of electrical equipment like starters, generators and ignition. Most of this copper goes in the automobile industry. Here copper-silicon alloys with their high strength, good corrosion resistance and superior welding properties are quite suitable. Phosphor and aluminum bronzes likewise are suitable for this industry.

Another ten percent of copper products goes in the construction industry - in buildings - again not including the actual electrical wiring. For this type of work the same kind of bronzes would be suitable as those used in the automotive industry. We could also mention another part of the transportation industry that makes good use of copper, only a different alloy is preferred. This is in shipbuilding, where copper nickels are used because of their ability to resist corrosion from such corrosive agents as salt water and particularly aerated salt water flowing at high velocity. The alloy of 70% copper and 30% nickel has been the standard condenser tube alloy of the U S Navy. Copper is also used in coating the bottom of ocean going ships to prevent fouling - particular by barnacles.

In medicine copper has limited uses. Mainly it is contained to tiny amounts in vitamin capsules and as surface antiseptics. This is due to the fact that in larger quantities copper is poisonous to the human body. It is only in very minute quantities that copper is of any advantage in medicine and is sometimes used in some very special diets and in a number of foods. (concluded next page)

MAN'S GUIDE (concluded)

Another important field where copper is still strongly employed is art. Again it appears both in its pure form and as a bronze - an alloy. Copper ornaments are known to everyone and likewise copper and bronze statues can be seen everywhere. Here copper has a definite advantage being attractive, either as a red metal or a golden bronze, and yet not too expensive to work in large sizes as would be the case with gold or silver, nor too hard to fashion in the desired shape.

These are the main uses of copper. It has many minor uses - both chemical and in its metallic form. As mentioned before, the continual change-over as other metals are found to be more suitable for any particular job, is slowly pushing copper out of some places where it held an important position before, but there is no need to worry that copper would ever lose its importance. Its abundance in nature and the ease with which it can be worked as also the gradual using up of other more favored metals like iron, all tend to ensure an important place for copper in man's industrial endeavors yet for some time to come.

\* \* \* \* \*

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Mr. Kreigh Tomaszewski  
 333 Richard Terrace S.E.  
 Grand Rapids 6, Mich.

These are the... it has many minor uses... As mentioned before, the... are found to be more suitable... pushing copper out of some... held an important position before, but there is no... copper would ever lose its importance... abundance in nature and the ease with which it can be worked... other more favored metals like iron... an important piece for copper in man's industry... yet for some time to come.

THE  
ARTICLE

WAS