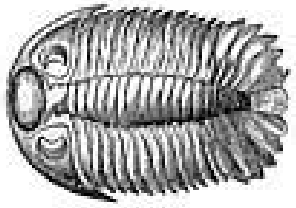
The Trilobite



Wisconsin Geological Society *May 2022*

NEXT WGS MEMBERSHIP MEETING
Monday, May 9, 2022 at 7:00 PM

Immaculate Heart of Mary Church Hall
(Downstairs, Enter at back of building)
1212 South 117th Street (Just North of Greenfield Ave):
West Allis, Wisconsin

Please follow the CDC guidelines and wear a mask unless you are fully vaccinated.
Feel free to socially distance if you are not comfortable sitting near someone else.
]

Please check your e-mails before coming to the meetings. If the meeting has to be cancelled, we will send out a notice by e-mail to those that get an electronic copy of the Trilobite. For the few who still get a hard copy in the mail, we will attempt to notify you by phone.

If you would like to exhibit and reserve a display case for our show in May, please let me know. Paul Schmidt—Show Chairman. pvs@wi.rr.com

Election of officers will occur during the June meeting.
See minutes on page 2 for those who are nominated.

We have a tour of the Waterloo Quarry scheduled for Saturday July 9th at 9:00 am.
W11184 Hubbleton Rd Waterloo, WI 53594

Closed toe shoes are required. Hiking boots or sturdy footwear recommended.

Sample collecting is allowed. Photography is allowed.

Our host is Dan Posthuma, General Manager at Michels Corporation.

I will need to get a full headcount so if you are interested and planning on going, let me know.

Pierre Couture 414-475-0186 pierre.couture007@gmail.com

WGS Minutes, April 11, 2022, Mother of Perpetual Help Parish Hall/On-line Zoom

The business meeting was called to order at 7:07PM by President, Pierre Couture with a good membership attendance.

The minutes of the March meeting were printed in *The Trilobite.* Tom Kullinger made a motion to accept the minutes as published. John Eyre second. The motion was approved.
New Membership: None
Guests: None
Treasury Report: Kitty Klein read the Treasurer's Report. Paul Okruhlica made a motion to accept the March Treasurer's Report for audit. Tom Kullinger seconded. The Treasurer's motion was approved.
Elections: Sue Eyre reported the current candidates for the June election and reported that we still need someone to step up for the position of Nomination Committee (2025). The current list of candidates are as follows:

President:	John Hammetter
Vice President:	Pierre Couture
Secretary:	Barbara Brown
Treasurer:	Kitty Klein
Trilobite Editor:	Paul Schmidt
Director (2025):	Dave Okruhlica

Nominations Committee (2025) Open
Committee Reports:

Show: Paul Schmidt reported that there were sign-up sheets in the back of the room for work positions at the show. Pierre said he was securing the help of his students for set-up. Jody also confirmed student help in the kitchen as in past years. Pierre said he would make some calls for help with security.
Mineral/Fossil Study Groups: None
Junior Rockhounds: None
Lapidary: None
Field Trips: Pierre reported that he has secured an opportunity for us to visit the Waterloo Quarry. The details are forthcoming. The membership voted by a show of hands to visit the quarry on Saturday July 9 or the alternate date of Saturday June 18.
Website: Sue Robinson reported that t he membership now has access to the Website and that the 2022 Show details have been updated. Hopefully it will be up and running for public use by Fall.

Old Business: As discussed at the March meeting, the WGS projector no longer works. Tom Kullinger proposed that we approve an expenditure of $1,200 to purchase a new unit. Following a discussion, Pierre offered to do some research and report back to the membership at the May meeting.

New Business: Denise Hohenfeldt reported on her trip to the Penn-Dixy Quarry and fossil hunting in NY State. Pierre also talked about his recent trip to Cave of the Mounds and the changes that have been made to the tours to allow visitors to tour at their own speed.

Door Prizes: Pierre announced that everyone should help themselves to a door prize.
Adjournment: Paul Okruhlica made a motion to adjourn. Denise Hohenfeldt seconded. The motion was approved. The meeting adjourned at 7:55PM.

Respectfully submitted by Sue Eyre, on behalf of WGS Secretary, Barbara Brown

Helium and the current shortage of it.

Helium is the second most abundant element in the universe after hydrogen. It is a colorless and odorless inert gas that has unique properties. Of all the elements, helium is the most stable; it will not burn or react with other elements. Helium has the lowest melting and boiling points. It exists as a gas, except under extreme conditions. At temperatures near absolute zero, helium is a fluid; most materials are solid when cooled to such low temperatures.

Helium is a non-renewable natural resource that is most commonly recovered from natural gas deposits. Geologic conditions in Texas, Oklahoma, and Kansas make the natural gas in these areas some of the most helium-rich in the world.

Perhaps the most familiar use of helium is as a safe, non-flammable gas to fill party and parade balloons. However, helium is a critical component in many fields, including scientific research, medical technology, high-tech manufacturing, space exploration, and national defense. Here are a few examples:

- The medical field uses helium in essential diagnostic equipment such as MRI's. Helium-neon lasers are used in eye surgery.
- National defense applications include rocket engine testing, scientific balloons, surveillance craft, air-to-air missile guidance systems, and more.
- Helium is used to cool thermographic cameras and equipment used by search and rescue teams and medical personnel to detect and monitor certain physiological processes.
- Various industries use helium to detect gas leaks in their products. Helium is a safe tracer gas because it is inert. Manufacturers of aerosol products, tires, refrigerators, fire extinguishers, air conditioners and other devices use helium to test seals before their products come to market.
- Cutting edge space science and research requires helium. NASA uses helium to keep hot gases and ultra-cold liquid fuel separated during lift-off of rockets.
- Arc welding uses helium to create an inert gas shield. Similarly, divers and others working under pressure can use a mix of helium and oxygen to create a safe artificial breathing atmosphere.
- Helium is a protective gas in titanium and zirconium production and in growing silicon and germanium crystals.
- Since helium doesn't become radioactive, it is used as a cooling medium for nuclear reactors.
- Cryogenics, superconductivity, laser pointers, supersonic wind tunnels, cardiopulmonary resuscitation pumps, monitoring blimps used by the Border Patrol, and liquid fuel rockets all require helium in either their manufacture or use.

For many of these applications, there is no substitute for helium. Helium is a non-renewable resource found in recoverable quantities in only a few locations around the world, many of which are being depleted. Accordingly, the U.S. has important economic and national security interests in ensuring a reliable supply of helium.

Above info from the Bureau of land management. Blm.gov

There are nine known isotopes of helium, but only helium-3 and helium-4 are stable.
Unlike most elements, helium's isotopic abundance varies greatly by origin, due to the different formation processes. The most common isotope, helium-4, is produced on Earth by alpha decay of heavier radioactive elements; the alpha particles that emerge are fully ionized helium-4 nuclei. Helium-4 has an unusually stable nucleus and was formed in enormous quantities during Big Bang nucleosynthesis.

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Helium-3

He-3 has two protons and one neutron (the most common isotope, helium-4, having two protons and two neutrons in contrast). Other ordinary hydrogen, helium-3 is the only stable isotope of any element with more protons than neutrons.
He-3 is a primordial substance in the Earth's mantle, considered to have become entrapped within the Earth during planetary formation.

Helium-3 is present on Earth only in trace amounts. Most of it has been present since Earth's formation, though some falls to Earth trapped in cosmic dust. Each year, about 2 kg of helium-3 escapes from Earth's interior, mostly along the mid-ocean ridge system.
Trace amounts are also produced by the beta decay of tritium. Tritium is a radioactive isotope of hydrogen and is typically produced by bombarding lithium-6 with neutrons in a nuclear reactor. The lithium nucleus absorbs a neutron and splits into helium-4 and tritium. Tritium decays into helium-3 with a half-life of 12.3 years, so helium-3 can be produced by simply storing the tritium until it undergoes radioactive decay.

Tritium is a critical component of nuclear weapons and historically it was produced and stockpiled primarily for this application. The decay of tritium into helium-3 reduces the explosive power of the fusion warhead, so periodically the accumulated helium-3 must be removed from warhead reservoirs and tritium in storage. Helium-3 removed during this process is marketed for other applications.

However, since the signing of the START I Treaty in 1991 the number of nuclear warheads that are kept ready for use has decreased. This has reduced the quantity of helium-3 available from this source. The DOE recognized the developing shortage of both tritium and helium-3, and began producing tritium by lithium irradiation at the Tennessee Valley Authority's Watts Bar Nuclear Generating Station in 2010. In this process tritium-producing burnable absorber rods containing lithium in a ceramic form are inserted into the reactor in place of the normal boron control rods. Periodically the bars are replaced and the tritium extracted.

Production, sales and distribution of helium-3 in the United States are managed by the US Department of Energy (DOE) Isotope Program

Much speculation has been made over the possibility of helium-3 as a future energy source. Unlike most nuclear fission reactions, the fusion of helium-3 atoms releases large amounts of energy without causing the surrounding material to become radioactive. However, the temperatures required to achieve helium-3 fusion reactions are much higher than in traditional fusion reactions, and the process may unavoidably create other reactions that themselves would cause the surrounding material to become radioactive.

Helium-4

HE-4 is the second lightest and second most abundant element in the observable universe. (hydrogen is the lightest and most abundant). It makes up about 24% of the total elemental mass, which is more than 12 times the mass of all the heavier elements combined. It is a product of both nuclear fusion and radioactive decay. The vast majority of HE-4 was formed during the Big Bang. Large amounts of new helium are also created by nuclear fusion of hydrogen in stars.

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He-4 cont…

On Earth, it is relatively rare—5.2 ppm by volume in the atmosphere. Most terrestrial helium present today is created by the natural radioactive decay of heavy radioactive elements such as thorium and uranium, as the alpha particles emitted by such decays consist of helium-4 nuclei.
This radiogenic helium is trapped with natural gas in concentrations as great as 7% by volume, from which it is extracted commercially by a low-temperature separation process called fractional distillation.
Terrestrial helium is a non-renewable resource because once released into the atmosphere, it promptly escapes into space.

Unlike any other element, helium will remain liquid down to absolute zero at normal pressures

The National Helium Reserve, also known as the Federal Helium Reserve, is a strategic reserve of the United States which stores its helium at the Cliffside Storage Facility about 12 miles northwest of Amarillo, Texas, in a natural geologic gas storage formation, the Bush Dome reservoir. The reserve was established with the enactment of the Helium Act of 1925.

The facilities were located close to the Hugoton and other natural gas fields in southwest Kansas and the panhandle of Oklahoma, plus the Panhandle Field in Texas. These fields contain natural gas with unusually high percentages of helium—from 0.3% to 2.7%—and constitute the United States' largest helium source. The helium is separated as a byproduct from the produced natural gas.

After the Helium Acts Amendments of 1960 the U.S. Bureau of Mines arranged for five private plants to recover helium from natural gas. For this helium conservation program, the Bureau built a 425-mile pipeline from Bushton, Kansas, to connect those plants with the government's partially depleted Cliffside gas field This helium-nitrogen mixture was injected and stored in the Cliffside gas field until needed, when it then was further purified.

By 1995, a billion cubic metres of the gas had been collected, and the reserve was $1.4 billion in debt, prompting Congress to begin phasing out the reserve in 1996. The resulting "Helium Privatization Act of 1996" directed the Department of the Interior to start selling off the reserve by 2005. By 2007, the National Helium Reserve was reported as "slowly being drawn down and sold to private industry." In May 2013, the House of Representatives voted to extend the life of the reserve under government control and it was to be managed by the Bureau of Land Management until Sept. 30, 2021. Any excess helium and helium assets remaining on that date were to be transferred to the General Services Administration (GSA) for disposal.

While formerly most of the helium production technologies were in the United States, additional producing countries have appeared. Qatar, Canada, Algeria and Russia are large producers of natural gas from which helium is extracted. Since 2013 the world's largest helium hub is no longer located in the United States of America but in Qatar, which produces 1.3 billion cubic feet of helium per year from a single project and meets 25% of the global demand.

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Currently there is a shortage of Helium and Spot prices have doubled in the last several months. Chip makers are very concerned since Helium is essential to the chip making process

A primary contributor to the latest shortage was a leak that caused an unplanned mid-January shutdown at the Cliffside crude helium enrichment plant, which is operated by the Bureau of Land Management to process raw helium gas from the Bush Dome reservoir in Texas. The closure, which followed a four-month outage of the plant last year, has removed a source that usually provides around 14.2 million cubic meters per year from the reservoir. That's about half the volume that would normally flow through the 724-kilometer pipeline that several major helium suppliers tap into to further purify the gas for distribution. A roughly equivalent volume of helium enters the pipeline from the Hugoton natural gas field located beneath Kansas, Oklahoma, and Texas.

On its own, the Cliffside loss probably wouldn't have been so disruptive had a new natural gas processing plant at Amur in the Russian Far East continued to operate after its September 2021 opening. But a fire in October, followed by an explosion in January, shut down that facility indefinitely. The war in Ukraine casts further doubt on long-term Russian helium availability. Most recently, in response to a shortage of gas resulting from the war in Ukraine, one of two Algerian liquefied natural gas plants was shut down and its gas feedstock was routed instead to Europe through an undersea pipeline.

The current helium shortage was exacerbated by the closure for scheduled maintenance earlier this year of two of Qatar's three helium-producing liquefied natural gas plants.

No one knows when the shortage will end. A restart of the Cliffside plant, probably under private-sector management, could come as early as May.. All the helium stored in the Bush Dome formation in Texas—both the 57 million cubic meters left in the federal reserve and a similar quantity of privately owned helium—must flow through Cliffside. The shortage should begin to ease once that spigot is opened and Qatar gets its production back up to full speed.

A long-delayed auction of the federal government's remaining helium reserve assets is scheduled to occur in September. After that, the private owner will be free to determine how to sell the helium. A bill introduced in the US House of Representatives that would require the new owner to continue supplying federally funded researchers from the reserve is unlikely to advance without being attached to more widely supported or must-pass legislation.

Info from wikipedia , BLM, and physicstoday

Our WGS Show will be returning to our Hart Park location May 14 and 15, 2022

The kitchen is again asking for baked goods that can be sold at the show.
If you would like to bake something for sale at the show and have not gotten the guidelines and slips to accompany the baked goods, they are published on the following pages. Otherwise you can pick some up at the may meeting.

Guidelines for Bake Sales City of Wauwatosa

Bake sales can provide good fund raising opportunities for non-profit organizations (Schools, sports teams, etc.). However, as in any situation where food is being prepared and offered for sale to the public, caution must be exercised to provide safe food. When consumers buy food, they have the right to expect that it will be safe and wholesome.

While no health department permit is required for "bake sales", the sponsoring organizations are responsible for the safety of the food products they offer for sale.

Although the traditional bake sale foods such as bread, cakes, cookies and candies rarely cause illness, it is important to remember that under the right circumstances any food can cause foodborne illness. Additionally, organizations may not conduct bake sales for more than 3 days during any 12 month period. This policy conforms to state law and may be subject to change at any time.

The following guidelines will improve your chances for a successful bake sale:

Maintain List

Name, address, name of product and phone number of each person who prepared an item for the event. A sign indicating that these items are "Home Baked" should be posted.

Packaging

All food must be individually wrapped in plastic, foil or waxed paper.

Acceptable Bake Sale Items (shelf-stable, non-potentially hazardous foods only):

-Breads (quick breads and yeast)

-Cakes (except cheesecakes or cream filled)

-Cookies

-Bars

-Muffins

-Candies

-Dried Fruits

-Cupcakes (except cream filled)

-Non-potentially hazardous fruit-based pies not requiring refrigeration

NOT ACCEPTABLE for Bakes Sales:

-Cheesecake

-Pastries

-Cream, meringue, custard, or pumpkin pies

-Cream-filled cakes, cupcakes, muffins or doughnuts

-Frosting and fillings made with cream cheese

-Home-canned foods

Please note: Potentially hazardous foods (foods that require hot or cold holding) are not allowed at a bake sale. This requires a Temporary Restaurant Permit and must be submitted at least 7 days in advance, prior to your event.

Food Allergens

Individuals who are allergic or very sensitive to food can touch or smell food and have an allergic reaction.
Some allergic reactions can be severe and require hospitalization.

The eleven most common food allergens are: Milk, Citrus, Eggs, Soy, Peanuts, Wheat, Tree nuts, Melon, Strawberries, Shellfish and Fish.

Please consider the following:
• Label items containing allergens, i.e. "contains nuts"
• Position foods containing known allergens away from other items or use a separate table
• Designate a person to handle the sales of only allergen-free foods

Transportation
• Vehicles used for transport should be clean and maintained in a good sanitary condition
• Food should be tightly wrapped to protect from dust, dirt and insects.
• Food should not be transported with pets

Leftovers
To avoid leftovers, reduce the price at least 20 minutes before the close of your fundraiser. If there are leftovers, be sure to wrap them securely.

The Final Word
When planning a bake sale, please observe the final requirements:

1. All food must be protected from unnecessary handling, airborne contamination, and pests. Baked goods should be placed in food storage bags or containers, wrapped with new food grade plastic, wax paper or foil to dispense from a covered food storage container.

2. Individuals shall thoroughly wash their hands before conducting the sale and after any act that could contaminate their hands, such as coughing, eating, or using the restroom.

3. Bare hand contact with food items is prohibited

4. A sign or placard stating "home baked" or "food not prepared in a commercial kitchen" must be posted.

5. Donors should be encouraged to identify/label any product that contains any major allergen. Major allergens include: Peanuts (peanut butter), eggs, wheat, soybeans, milk and milk products (e.g. butter, buttermilk, cheese), and tree nuts (e.g. almonds, pecans, walnuts, cashews).

6. The event organizer should retain a list of who donated what food items or wrapped baked items should be labeled with the baker's name in order to identify the source of the product.

7. Good standards of housekeeping and hygiene are expected of persons operating the bake sale. All foods should be displayed on clean counters and the bake sale area maintained in a clean and sanitary condition.

Additional consumer food safety information can be obtained by visiting www.foodsafety.gov or by contacting the Wauwatosa Health Department.

WGS BAKED GOODS GUIDELINES & LABELS FOR EACH DONATION.

--PER WAUWATOSA HEALTH DEPT.: PLEASE WRAP EACH PIECE IN PLASTIC WRAP, IF FEASIBLE, & GATHER THEM WITH THE ID LABEL. –

NO: CHEESECAKE; PASTRIES; CREAM, MERINGUE, CUSTARD OR PUMPKIN PIES; CREAM-FILLINGS; OR, FROSTINGS MADE WITH CREAM CHEESE.

DONOR NAME & PHONE NO. :

ITEM NAME:

ALLERGENS (CIRCLE): DAIRY/MILK/BUTTER; EGGS; SOY; PEANUTS; TREE NUTS; WHEAT; MELON; CITRUS; STRAWBERRIES; CHOCOLATE; OTHER____________.

DONOR NAME & PHONE NO. :

ITEM NAME:

ALLERGENS (CIRCLE): DAIRY/MILK/BUTTER; EGGS; SOY; PEANUTS; TREE NUTS; WHEAT; MELON; CITRUS; STRAWBERRIES; CHOCOLATE; OTHER____________.

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Official publication of
The Wisconsin Geological Society Inc.

The Trilobite is published monthly, except for the months of July and August. It is mailed without further charge to the members of the
Wisconsin Geological Society Inc.
Subscription fee to non-members is $10.00 per year.

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The Purpose of the Wisconsin Geological Society, Inc is to:

Create an interest in the study of Geology

Provide a means for personal development in Geology.

Disseminate knowledge concerning all phases of Geology.

The **Wisconsin Geological Society, Inc** is a member of the Midwest Federation of Mineralogical and Geological Studies, which is a part of the American Federation of Mineralogical Societies.
www.amfed.org/mwf

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The Trilobite
Official Publication of:
The Wisconsin Geological Society Inc.
8213 Red Arrow Ct.
Wauwatosa, WI 53213

May 2022
Volume 78 Number 5

FIRST CLASS

To:

General Membership meetings are held each month (except July and August) on the second Monday of the month at 7:00p.m. in the Parish Hall (lower level) of the Immaculate Heart of Mary Catholic Church, 1212 South 117th Street; West Allis, Wisconsin.

All news, articles, and pictures to be included in the Trilobite should be forwarded to the editor by the 15th of the month. They can be mailed or e-mailed to:
Paul and Verna Schmidt
8213 Red Arrow Ct.
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WGS Members, Please Note:

Your Membership Dues are renewed in November.

$15.00 Single Membership
$20.00 Family Membership

Please remember to send your check to:
Kitty Klein
2477 S. 73rd St. West Allis, Wi 53219

The check should be made out to WGS

The Wisconsin Geological Society, Inc is now in it's 86th year