Bulletin

of the Eastern Section of the National Association of Geoscience Teachers

Volume 69, Issue 1: Winter 2019

JUNE NAGT-ES SECTION MEETING INFO & REGISTRATION IN THIS ISSUE!

The Falun Copper Mine

by Jason Petula, *Millersville University of Pennsylvania*, NAGT-ES President

Outdoor education in the United States is rarely a formal part of K-12 curricula. Outdoor education programming is often a function of a passionate teacher, informal education overnight camps, or youth programs (e.g., Scouts BSA). Where in the United States can you imagine what I describe next happening with students?

With snow swirling across a great pit, middle school students build fires around large boulders. After the rocks cool, they become brittle and crack. The students use wedges and sludge hammers to further fracture the rock. A teacher interrupts the students, "This is how miners worked the ore from this mine, which has been in operation for at least 1000 years."

The scene described above was an outdoor education lesson in Falun, Sweden. The Falun Copper Mine was a source of wealth for Sweden. The students knew this already from a previous visit to the mine. Today, they were learning a lesson in sustainability; specifically how the Swedes used a by-product of the copper extraction process to produce a popular red paint known as Falu Red.

After the copper was extracted, the waste material was piled around the perimeter of the mine. The material, abundant in iron, is left outside for 20 years. Then, the rocks are washed of their oxidized metal, which gives the paint the iconic red hue. And, again, as part of the outdoor education curriculum, the students learn about Earth's resources.

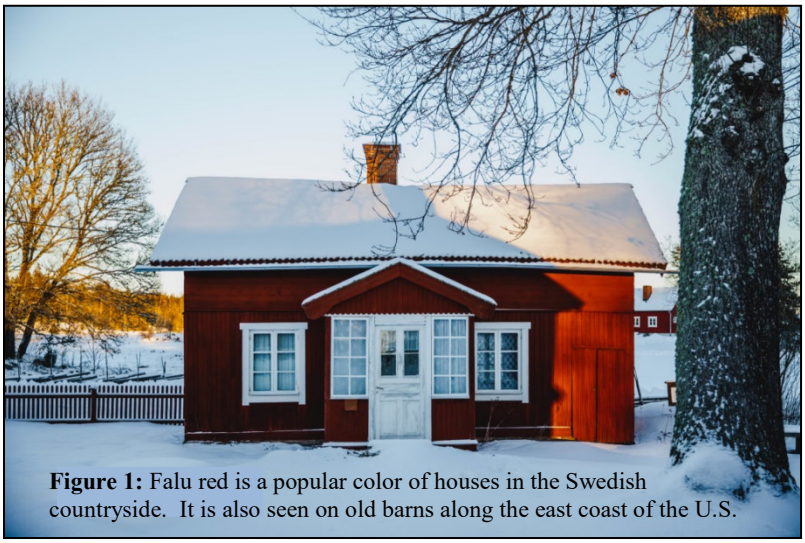


Figure 1: Falu red is a popular color of houses in the Swedish countryside. It is also seen on old barns along the east coast of the U.S.

My latest trip to Sweden was a result of my university's goal to increase study abroad opportunities for our students. Study abroad experiences are considered a high-impact practice. Hence, it was no surprise that the trip likely forever changed the lives of the students who joined me for the journey.

But, now that I am back home and have the National Association of Geoscience Teachers – Eastern Section (NAGT-ES) on my mind… I have a wonder? I wonder if the section would have interest in a very unique future conference or professional development experience. Imagine breaking away from our section to explore the geologic history of Scandinavia. Or, a trans-Atlantic crossing with geology excursions to Canada, Greenland, Iceland, and Ireland. Let me know your thoughts. Maybe I can have a proposal prepared for our upcoming conference this summer in Martinsburg.

Last call for nominees...

by Christopher Roemmele,
West Chester University
NAGT-ES Awards Chair

Our deadline for submitting nominees for all our Eastern Section awards has been extended to March 1. If you work with or know someone whom you feel deserves this recognition, then I strongly urge you to nominate this person for one of our Eastern Section awards, or one of the National NAGT awards. Information about all our Eastern Section awards can be found on our section website. You must place your nomination via the online forms found on the National NAGT web site at http://nagt.org/nagt/programs/oest.html, and they will ultimately be forwarded to me as section awards chair.

Here is a list of our awards.

OUTSTANDING EARTH SCIENCE TEACHER

The OEST Awards program was adopted by NAGT in 1971. Its purpose to honor pre-college teachers of earth science, their excellence and commitment to teaching and teaching earth science

DIGMAN AWARD FOR EXCELLENCE IN GEOSCIENCE EDUCATION

The Digman Award is designed to recognize an individual who works to bring geoscience to the general public. We look for individuals who are not teachers, but work in a capacity that educates the general public in areas of the geosciences. Museum directors, curators and assistants, state survey employees, mine and quarry public relations people would all qualify for this award. The nomination information for this award is also on our section website.

JAMES O'CONNOR MEMORIAL FIELD CAMP SCHOLARSHIP

The James O'Connor scholarship is given to a college geology or earth science major who is attending a geologic field camp course (typically over the summer) as part of their college degree program. The $500 scholarship assists the student in covering the expenses of their field camp. Nominate a student currently enrolled in your geology program. Nomination information appears on the section website.

DISTINGUISHED SERVICE AWARD FOR THE EASTERN SECTION

The Distinguished Service Award is given to a member of the Eastern Section (still actively teaching or retired) who has, over the years, contributed to the growth and activities of the Eastern Section. This person should have a history of continued service to the Eastern Section. Nomination information appears on our website.

JOHN MOSS AWARD FOR OUTSTANDING COLLEGE TEACHING

The John Moss award is reserved for instructors and professors who, at the college level, model and promote outstanding teaching in the geosciences. Nomination information appears on section website.

A Solar Eclipse Teacher Workshop

by Harold A. Geller,
Geroge Mason University

Abstract

We report on the execution of a solar eclipse teacher workshop implemented at George Mason University under the sponsorship of the Virginia Space Grant Consortium. We present the venue and the implementation plans for the workshop. The Lunar Phases Concept Inventory was utilized to assess the knowledge of the teachers just prior to the workshop and at the conclusion of the

workshop. Results from the administration of the Lunar Phases Concept Inventory are presented. We conclude that participation in the workshop did aid those teachers who were having difficulty with the lunar phases and solar eclipse concepts.

Introduction

The Virginia Space Grant Consortium sponsored a series of teacher workshops across the Commonwealth of Virginia in the summer of 2017, prior to the solar eclipse of 21 August 2017. Here we describe the implementation of a teacher workshop at George Mason University, held on 4 August 2017.

Discussion

Upon entry in to the conference room, the teachers were welcomed and given an oversized envelope. Each envelope contained the following material:

- 10 solar eclipse glasses;
- 2 copies of the Lunar Phases Concept Inventory (one used as pre-test and one for post-test assessment);
- a standard sized envelope with the United States Postal Service (USPS) solar eclipse stamp;
- a raffle ticket (used for distribution of some door prizes;
- a list of resources for understanding and observing the solar eclipse;
- the National Science Teachers Association (NSTA) guide to observing the solar eclipse; and,
- a night sky chart for the month of August, the month of the total solar eclipse.

After all the teachers introduced themselves, the moderator administered the pre-test Lunar Phases Concept Inventory. This multiple choice quiz consists of 20 questions regarding concepts associated with the phases of the Moon. The quiz was developed by Lindell and Olsen (2004) of Southern Illinois University. This concept inventory has been extensively utilized in the testing of conceptual understanding within introductory astronomy courses (Balfour and Kohnle, 2010).

Excluding the demographic questions which were added to the inventory, here are the concepts explored in the 20 questions (one more than the originally reported inventory) of the concept inventory from Lindell and Olsen (2004):

1. Where to see waxing crescent Moon at sunset
2. Time to complete one orbit
3. Moon orbits in which direction
4. Cause of new moon
5. Frequency of new moons
6. Phase of Moon for solar eclipse
7. Full Moon in Australia
8. Orbital period vs. phases period
9. Earth-Moon-Sun Positions for new moon
10. Time to observe quarter moon at highest point
11. Direction of Moon rising
12. Shape of a Moon rising at sunset
13. Sun's location in geocentric perspective for particular phase
14. Time until Moon appears the same
15. Moon's appearance half-way around the world
16. Alignment between Sun/Earth/Moon to produce Waxing crescent Moon
17. Time difference between different phases
18. Cause of phases
19. Direction of Moon rising
20. Direction of Moon's orbit

Immediately following the administration of the Lunar Phases Concept Inventory, the facilitator handed out large pads of Post-it® note paper to each table and asked that participants write one or two questions (one question to a Post-it®) regarding their most pressing question regarding the solar eclipse that was to take place 17 days after the workshop. Each teacher was asked to place their Post-it® with their question on a wall for review by all of the workshop participants.

For completeness, here are all the questions that were produced by these workshop participants, categorized as explained in the ensuing paragraph.

Observing Issues:

- What is the best possible way to observe the total eclipse with a large group of people?
- Any tips for photographing the eclipse? We already have a solar filter and a good camera.

- Can we look directly at the Sun with eclipse glasses? Why?
- Does where you are on Earth effect what the Moon looks like?
- If solar viewing glasses are not available, what would be a few other ways students can view eclipses?
- How would I teach eclipse viewing safety to a public safety worker (e.g. EMS, police, fire)?
- What are annular (not solar or lunar) eclipses?
- What direction do you face to get the best view of the eclipse?
- What will be the elevation of the Sun in Washington DC during the eclipse?

Physical Properties of Earth, Moon and Sun:

- Is the Moon moving closer or farther from the planet? This year I heard both on the news.
- I want to learn more about the Sun itself.
- What would happen to the Earth if we had no Moon?
- Why is the corona so hot compared to the photosphere?

Eclipse Timing Issues:

- Which cultures first tracked and predicted eclipses?
- How are eclipses predicted? What is the pattern, if there is one?
- If eclipses happen regularly, what makes the upcoming eclipse extraordinary?
- Why are lunar eclipses so much more common than solar eclipses?
- Why isn't every eclipse a total eclipse, at least somewhere on Earth?
- How frequently do total solar eclipses occur in any given area?
- What is the largest (length and width) of the path of totality possible?
- When and where should we be on August 21st to get the best view of the eclipse in Fairfax, VA.
- How long is totality?
- How often do eclipses occur?
- How long before the eclipse passes over the USA again?
- Why do solar eclipses occur so infrequently?

Miscellaneous:

- How does the Moon relate to tides especially in places like the Bay of Fundy?
- How do you get high school students excited about astronomy? Some are but so many don't think it is relevant.
- What is the best way to teach the special relationships of the solar system?
- What is the best way to explain total solar eclipses to a general audience?
- To learn more about shadows in space.
- Are there changes that are occurring to the Earth's orbit and to the Moon's orbit?
- What are some common misconceptions related to eclipses?
- Is it true that animals act differently during an eclipse?
- I would like to know if the Moon has any effect on earthquake activity.
- I want to know the answers to the pre-test. I need to get up to speed on Earth-Sun-Moon relationships.

As the facilitator of the workshop read each of the questions aloud, the participants were encouraged to provide their own input with the ultimate goal to re-organize the questions on the wall using a categorization that was driven by the questions themselves. As partitioned above; if a question asked about the temperature of the surface of the Sun, that was placed in a category called physical properties of the Earth, Moon and Sun. This also included the mass, size and other physical parameters. All questions were placed in one of the three initial categories established. Those that didn't appear to fit any initial category developed were then placed in the miscellaneous category.

This question-producing exercise was followed by a discussion regarding the reason for the lunar phases. The discussion was interspersed with demonstrations of the positions of the Sun, Earth and Moon; in conjunction with a physical model of the system. Teachers were encouraged to use a physical model with their own students and the scale of the size of the solar system was highlighted.

A basketball was used as a surrogate for the Earth. It was then noted that the Moon, with such a scale, would actually be about 30 Earth diameters, or at

this scale about 30 feet (9.14 meters) from the basketball Earth. The teachers were then asked where the Sun would be in this type of scaled model. While some teachers were not familiar with such a scale model of the solar system, some did have the experience with such a model and were aware that the Sun would be a ball with a diameter of about 100 feet (30.5 meters) and at a distance of about 2 miles (3.22 kilometers).

It was strongly suggested to the participants that they emphasize such a scale model of the solar system with their students. Unfortunately, this is not often done in the media, nor is it known by much of the public, let alone students in their classes.

At this point, the reasons for the different phases of the Moon was reiterated as being caused by the relative positions of the Sun, Earth and Moon. Additional demonstrations were done by utilizing a number of physical models of the Earth, Moon and Sun. The facilitator utilized two different commercial models of the Sun, Earth and Moon system. Also demonstrated was a simple model utilizing a basketball (as the Earth), a baseball (as the Moon); and a bright incandescent lamp (as the Sun).

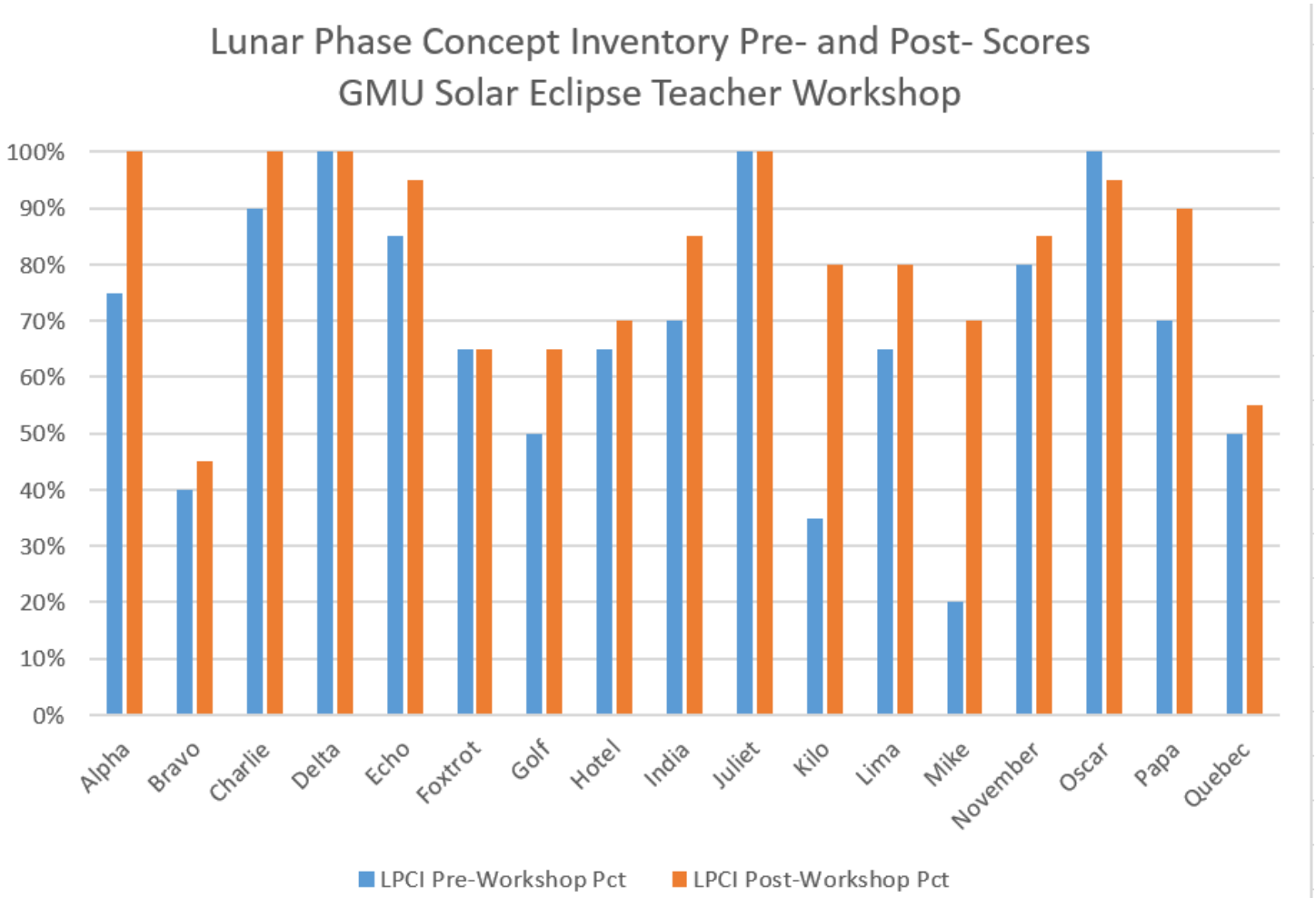
Workshop participants were next introduced to a guest speaker, Dr. Arthur Poland. Dr. Poland had served as the Project Scientist for the Solar and Heliospheric Observatory (SOHO) mission of the National Aeronautics and Space Administration (NASA), a mission to study the Sun. Dr. Poland spoke about the nature of the Sun with the teachers. He not only described his participation in the SOHO mission; but, he continued to describe his own experiences in observing solar eclipses. After the conclusion of the discussion led by Dr. Poland, the teachers were invited out to the patio region outside the workshop conference room.

Once on the patio, all workshop participants were instructed as to the safety procedures that all people should utilize when observing the Sun, whether at a solar eclipse, or any other day. The facilitator utilized the NASA safety guidelines online at https://eclipse2017.nasa.gov/safety. For completeness (with facilitator emphasis added), NASA warns the observer to:

- **always** inspect your solar filter before use; if scratched or damaged, discard it. Read and follow any instructions printed on or packaged with the filter;
- **always** supervise children using solar filters;
- stand still and cover your eyes with your eclipse glasses or solar viewer before looking up at the bright sun (after looking at the Sun, turn away and remove your filter — do not remove it while looking at the Sun);
- **not look** at the uneclipsed or partially eclipsed Sun through an unfiltered camera, telescope, binoculars, or other optical device;
- **not look** at the Sun through a camera, a telescope, binoculars, or any other optical device while using your eclipse glasses or hand-held solar viewer — the concentrated solar rays **will damage** the filter and enter your eye(s), **causing serious injury**;
- seek expert advice from an astronomer before using a solar filter with a camera, a telescope, binoculars, or any other optical device (note that solar filters must be attached to the **front** of any telescope, binoculars, camera lens, or other optics);
- (if you are within the path of totality) remove your solar filter **only** when the Moon completely covers the Sun's bright face and it suddenly gets quite dark (experience totality, then, as soon as the bright Sun begins to reappear, replace your solar viewer to look at the remaining partial phases);
- (outside the path of totality) **always** use a safe solar filter to view the Sun directly; and,
- (if you normally wear eyeglasses) keep your eyeglasses on (put your eclipse glasses on over them, or hold your handheld viewer in front of them).

Workshop participants were able to observe the Sun through the solar eclipse glasses provided to all workshop participants. Workshop participants were also exposed to alternative methods for observing the Sun and the eclipse. Available to the workshop participants were:

- a hydrogen alpha filtered telescope;
- a pair of solar binoculars; and,
- an indirect observing method utilizing a pair of standard binoculars.



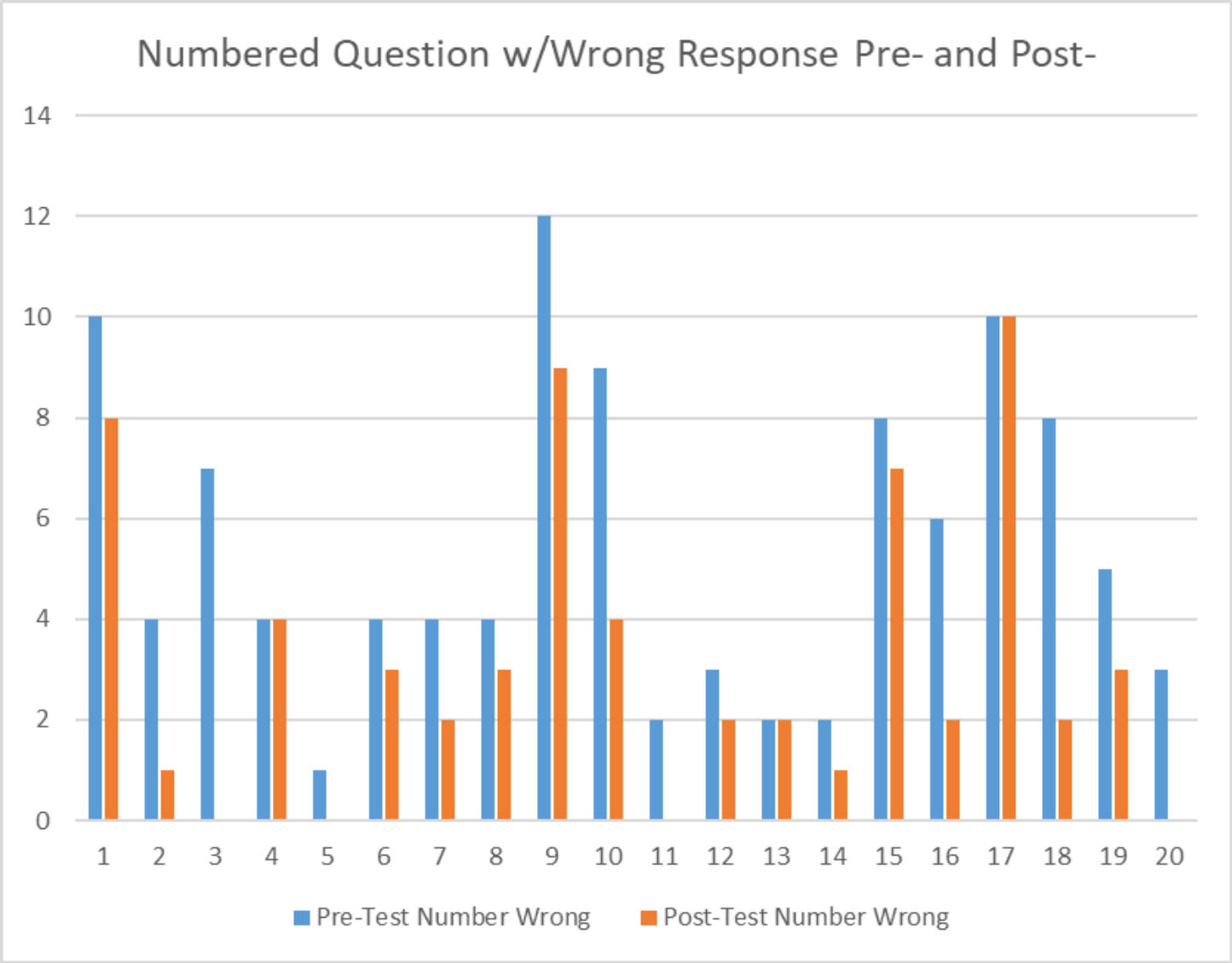
Following the solar observation session on the patio outside the conference room, there was a brief thirty minute break for lunch. Participants were told beforehand to bring their own lunch food. After the lunch break there was a discussion regarding the methods used in the prediction of eclipses.

Workshop participants were informed about the prediction of eclipses going back a few millennium in history. Not only were the ancient Greeks capable of predicting eclipses, but the Babylonians and other civilizations were also capable of predicting eclipses. The workshop participants were also made aware of the ability to predict eclipses by the builders of Stonehenge, the famous stone structure in England.

Workshop participants were presented with a scale model of Stonehenge. An historical overview was provided and the teachers learned about the different phases of the construction of Stonehenge. The initial observatory was estimated to have been built about 6000 years ago. The inner circle of stones came later, about 4000 years ago. Nonetheless, astronomers were able to decipher the orientations and counting of stones which could be used to predict eclipses. (Chippindale, 2012)

The teachers were then invited to use materials supplied in a box. Each box was a plain cardboard box with standard classroom materials including construction paper, Styrofoam balls of different sizes, wood dowels, glue, a tape measure, adhesive tape, and some small sources of light. The workshop participants worked in groups to develop alternative ways to demonstrate and explain the concept of eclipses. After a 20-minute period of time, each group of teachers (3-4 teachers per group) were asked to share out the activities that their group had developed to teach the concept of eclipses to a group of students.

Following the share out time period, the door prize raffle was held. The facilitator of the workshop used a hat to place the raffle halves in, and randomly pick out raffle tickets. The door prizes included: children's books about Pluto; children's books about solar eclipses; a packet of solar eclipse stamps; and, extra solar eclipse glasses.



After the awarding of door prizes, the participants were asked to complete the same Lunar Phases Concept Inventory as they had done at the start of the workshop.

Results

The median score on the Lunar Phases Concept Inventory pre-test was 68%. Three of the 17 participants (18%) who took both the pre and post tests had a perfect score. The lowest grade on the pre-test was a 20%. The median score on the Lunar Phases Concept Inventory post-test was a 81%. The lowest grade on the post-test was a 45%.

Comparison of the median scores demonstrated a 19% rise in scores between pre and post test results. Three of the 17 participants (18%) had no change in scores. One of the 17 scored lower on the post test. It is noted that the participant who scored lower had initially a perfect score on the concept inventory test. The median rise in scores was 13% higher.

Here in Figure 1 are the results of the administration of the Lunar Phases Concept Inventory, both pre- and post- workshop results, presented in graphical form.

Another approach to analyzing the data included a test item analysis. Here in Figure 2 we see a summary of the different number of wrong answers within the pre- and post-workshop scores.

The largest improved response occurred with questions that addressed the sense of how the Moon orbits around the Earth (questions 3 and 20). Fully 41% of the teachers could not properly answer that the Moon orbits in a counterclockwise orientation to the Earth as viewed from the north. The number of wrong respondents dropped to zero in the post-test.

This may be attributable to the physical models of the Earth-Moon system utilized in the workshop.

The largest number of wrong answers occurred with respects to questions dealing with the time of the rising or setting of a particular phase of the Moon (questions 10 and 16). A total of 70% of the teachers responded incorrectly in the pre-test. In the post-test, this only decreased to 52% of the respondents. This begs the question of what could best be demonstrated to get more correct answers to this type of concept.

Another low performance test item (question 17) dealt with the time period between certain phases of the Moon. Approximately 58% did not respond correctly to a question about this; and more disturbing was that there was no change in the pre- and post-workshop responses.

Finally, it should be noted that one of the largest changes in the positive direction dealt with the cause of the phases of the Moon itself (question 18). Initially, 46% of the workshop respondents initially did not properly answer the question about the cause of the phases of the Moon. It was quite disheartening to find so many wrong answers about the causes of the phases of the Moon. After the conclusion of the workshop, only 12% did not properly respond to the question.

Conclusions

We conclude that the implementation of a teacher workshop can increase the performance of teachers on the lunar phase concept inventory. While some of the concepts tested in the inventory are easily addressed, it is apparent that there is a major problem with the teachers' concept of the time between phases and the time of day of the rising and setting of the different phases of the Moon on any given day.

Acknowledgements
The author acknowledges the Virginia Space Grant Consortium and Dr. Edward Murphy of the University of the Virginia for making this workshop possible. The author also thanks the participants of the workshop and the administrative support at both the University of Virginia and George Mason University.

References

Balfour, J. and Kohnle, A. (2010). *Testing Conceptual Understanding in Introductory Astronomy*. **New Directions in the Teaching of Physical Sciences**, No. 6, pp. 26-29.

Chippindale, C. (2012). **Stonehenge Complete** (4th edition). New York: Thames and Hudson, Inc.

Lindell, R.S. and Olsen, J. P. (2004). *Developing the Lunar Phases Concept Inventory*. **AIP Conference Proceedings**, 720(1): 73-76.

UPJ Geology Club at NE GSA meeting

The 54th Annual Meeting of GSA's Northeastern Section will take place in Portland, Maine, at the Holiday Inn By The Bay, in downtown Portland. The technical program that covers a diverse set of geologic topics and processes, including applied geology; education; northeastern tectonics; Quaternary geology and climate; coastal, groundwater, and river processes; geological hazards; and magmatism, metamorphism, and structural geology.

Will you be attending? If so, stop by the University Of Pittsburgh At Johnstown Geology Club booth in the exhibit hall. The students have assembled a large variety of rocks, minerals and fossils. Our sales support the geology club activities that include attendance at GSA and our annual spring break trip. Last year we toured the geology and history of Scotland. This year the students are off to explore the volcanic areas of Ecuador!

Stop by our exhibit booth and mention that you are a member of NAGT and receive a gift from the geology club!

NAGT Eastern Section 2019 conference details

by Mike O'Donnell
Blue Ridge Community & Technical College
NAGT-ES Vice President

The 2019 National Association of Geoscience Teachers – Eastern Section (NAGT-ES) meeting will be held in Martinsburg, WV and the eastern panhandle of West Virginia June 6, 7, and 8. Though some of the program has not been ratchetted down as of right now, I can say that what is scheduled should meet various interests of all that attend. All registration needs to be completed ahead of time either sending the form through snail mail or registering online once that is set up. Below is an outline of what to expect in June.

June 6, 2019, Thursday:
4 PM on hotel check-in, Holiday Inn, Martinsburg (information below)
7 PM Social hour at the hotel with opening keynote by Dr. Wendy Bohon, (*IRIS*) on "Science Communication: from the chatroom to the classroom"

June 7, 2019, Friday:
9 AM to 11 AM morning workshops on the campus of Blue Ridge Community & Technical College.

- Wendy Bohon (*IRIS*) on IRIS teaching tools
- Russ Kohrs (*Lord Fairfax Community College, Massanutten Regional Governor's School*) on virtual field experiences (in class and as homework)
- Callan Bentley (*Northern Virginia Community College*) on geological drawing
- Mark Uhen (*George Mason University*) on teaching with the Paleobiological Database
- Tim Farris (*Blue Ridge Community & Technical College*) with a drone demo.

11 AM to noon business lunch. Indicate if you will attend in the registration (place TBD). In the afternoon, there is a choice of 2 different field trips:

Trip A: 1 PM to 5 PM Geology of Harpers Ferry led by Beth Doyle (*Northern Virginia Community College*

Trip B: 1 PM to 4 PM Geology from the waterline: Paddle / float trip on the Potomac River below Harpers Ferry (+$25 fee/person)

5 PM to 7 PM dinner on your own
7 PM the GeoAuction! And social hour at the Holiday Inn.

June 8, 2019, Saturday
Choice of two field trips:

Trip A: 8 AM to 3 PM Geology of Corridor H, Wardensville to the Alleghany front led by Callan Bentley (*Northern Virginia Community College*), boxed lunch

Trip B: 8 AM to 3 PM Karst geology and hydrology of the Shenandoah Valley led by Dr. Dan Doctor (*USGS*), boxed lunch (+$25 fee per person for cave entrance fee)

6:30 PM Awards banquet and keynote address from Dr. Karen Kortz (*Community College of Rhode Island*) on student misconceptions in the geological sciences

Syncline/Anticline pair on the Paterson Creek Mountain Anticlinorium, Corridor H

Registration Form

National Association of Geoscience Teachers Eastern Section 2019 meeting
June 6, 7, 8, and 9, 2019 – Martinsburg, WV

Each participant must submit a registration form via US mail. Lodging is the responsibility of the individual. Hotel accommodations are listed on the next page. The conference hotel will be the Holiday Inn, Martinsburg.

A block of rooms is available until May 16, 2019. Mail registration form along with a check made out to NAGT-ES to: **Michael O'Donnell, 13650 Apple Harvest Dr., Martinsburg, WV 25403**

Name (as you want it to appear on the nametag):
Institutional affiliation (school or organization):
Email:
Mailing Address:
Phone: Cellular: Home/Work:

2018 OEST Award winners attend free! Indicate if you are last year's winner on your form.
Please **circle** the appropriate selection(s) below:

Full Conference Registration *(includes Friday afternoon & Saturday field trips)*	
NAGT member (prior to May 15, 2019	*$110*
NAGT member (after May 15, 2019)	*$125* *$90*
Spouse/Significant other	
Student	*$80*
Non-member	*$125*
Friday Business Luncheon	$0
Printed program	$20

Saturday Box Lunch Choices: **(circle one)**

Roast Beef
Turkey
Ham
Veggie

Boxed lunches include wrap of your choice (above), bottled water, chips, and a cookie.

Friday Only Registration	
NAGT member	*$70*
Student	*$50*
Non-member	*$80*
Trip A – Harpers Ferry	$0
Trip B – Paddle on the Potomac	$25

Everyone should pick one

Saturday only registration	
NAGT member	*$60*
Student	*$40*
Trip A – Corridor H	$0
Trip B – Karst of Shenandoah Valley	$20

Everyone should pick one

Saturday night awards dinner, $30 per person		**Please indicate # for dinner**

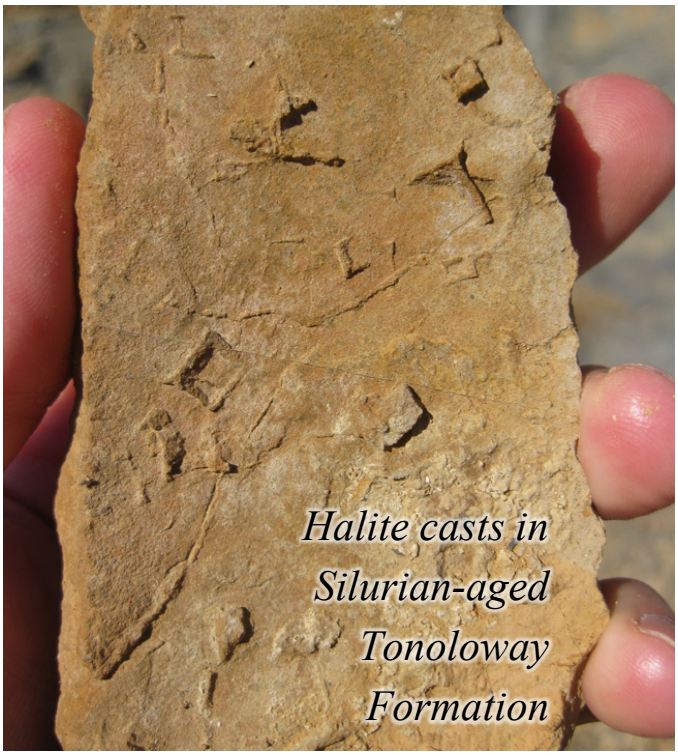
Total amount enclosed

Hotel accommodation options:

Holiday Inn Martinsburg
(Banquet location and conference headquarters)

Holiday Inn does not serve a continental breakfast as there is an onsite restaurant.

301 Foxcroft Avenue
Martinsburg, West Virginia
25401
Phone: 304-267-5500
Rooms will be available to conference attendees at the rate of $104.00 per night plus tax. Members are responsible for their individual reservation. Holiday Inn, Martinsburg will hold a block of rooms for registrants until May 16, 2019. After that date, room rates will revert to the current charge of the hotel. Reservations are made calling the hotel directly at the above number and referencing the National Assn. of Geoscience Teachers Eastern Section.



Hampton Inn Martinsburg Foxcroft

975 Foxcroft Avenue, Martinsburg, WV, 25401, US

Phone: 866-238-4218

Fairfield Inn & Suites by Marriott Martinsburg

451 Foxcroft Ave, Martinsburg, WV 25401
Phone: (304) 901-3003

Falling Springs Falls tufa deposit near Covington, Virginia (photo by Dan Doctor):

PRESENTATION PROPOSAL FORM
NAGT-ES Section 2018 Annual Meeting
Submission Deadline: May 16, 2019

Return completed form to: Michael O'Donnell, modonnel@blueridgectc.edu
Or at the above address.

_____ **Workshop** - A workshop is 1.5 hour hands-on/minds-on that engages participants in 21st century geoscience experiences. Proposals that highlight 21st century technologies are encouraged.

_____ **Poster** - The poster session is a 30 minute social to highlight geoscience and education scholarship.

Name: _____

E-mail: _____

Affiliation: _____

Address: _____

Phone: _____

Presentation Title: _____

Description (max. 100 words):
_____
_____
_____
_____
_____

Presentation equipment needed:
_____

Other facilities needed? (subject to availability): _____

“FROM THE ARCHIVES” Winter 2019 edition

by Steve Lindberg
University of Pennsylvania at Johnstown
NAGT-ES Archivist

For this installment we look back at some selected items from the 1991 combined meeting of the Eastern and New England Section that was held April 26-28 at Greenfield Community College in Greenfield Massachusetts.
The meeting and field trips focused on the geology of the Connecticut Valley as well as glacial features of north-central Massachusetts. The three day meeting provided a very ambitious schedule that included workshops, poster presentations and a large selection of field trips.
Here is the preface along with several of the illustrations from the published field trip and meeting guidebook; Enjoy!

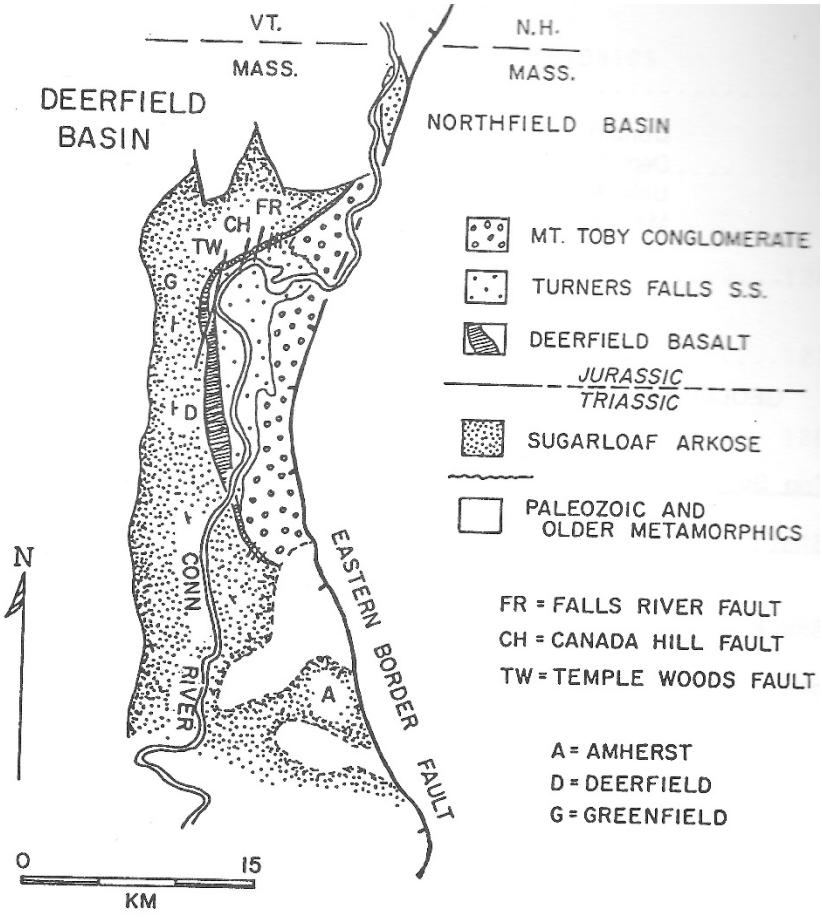
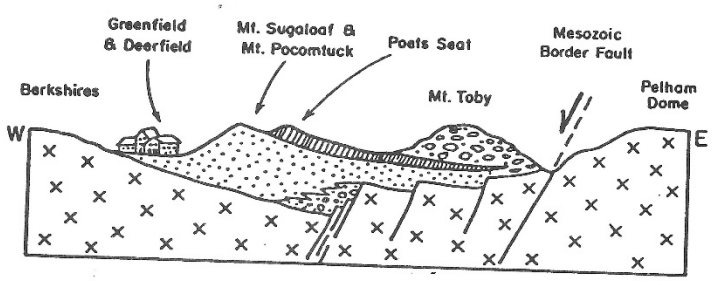


Figure 1.

Generalized geology of the Deerfield Basin and an east-west cross section through the basin at the position of Mt. Toby.

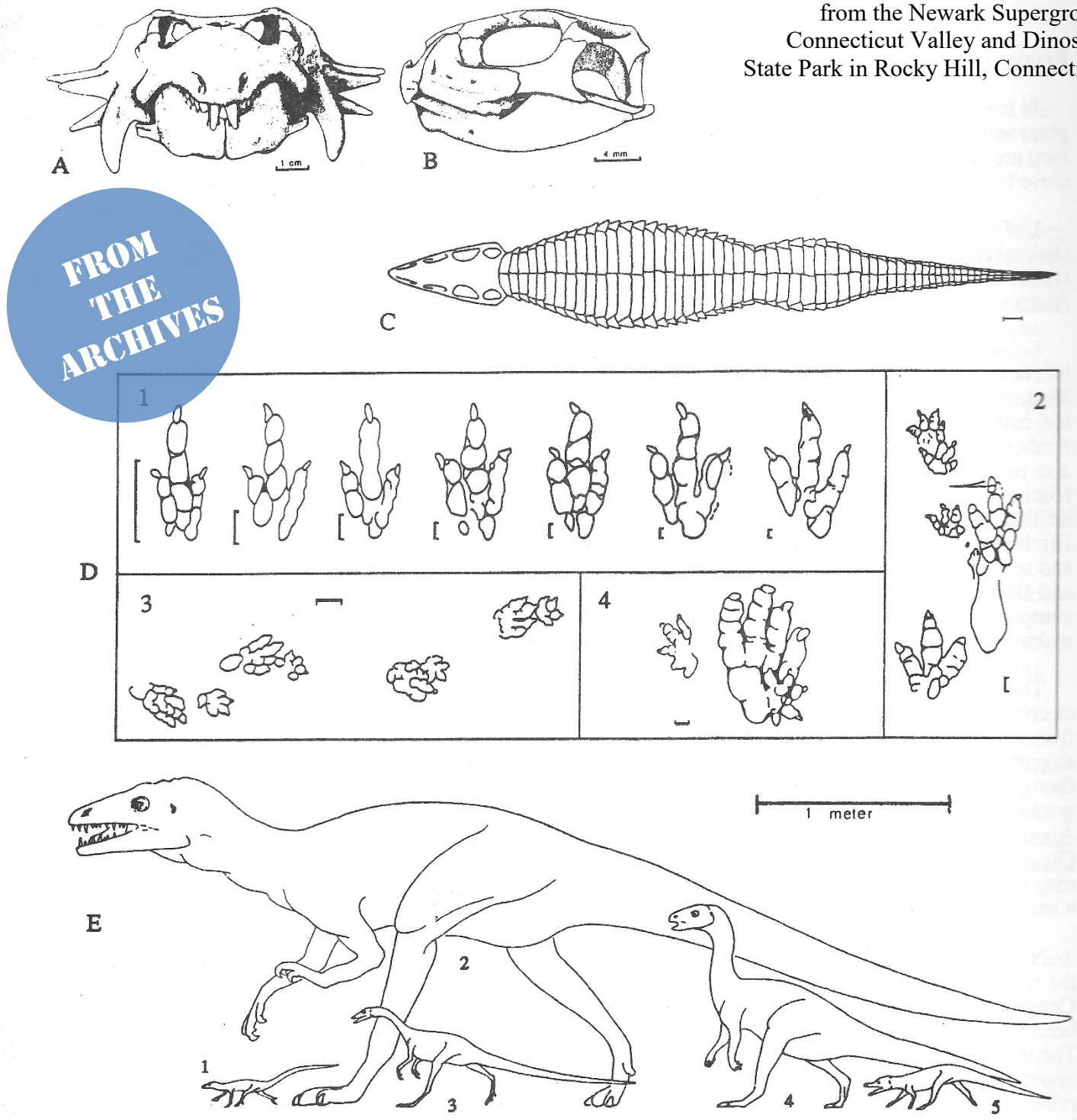


GENERALIZED GEOLOGIC CROSS SECTION
OF THE DEERFIELD BASIN

FIGURE 1

Figure 2.

Representative reptiles and footprints from the Newark Supergroup, Connecticut Valley and Dinosaur State Park in Rocky Hill, Connecticut



FROM THE ARCHIVES

Figure 2. Representative Triassic and Jurassic reptiles and footprints from the Newark Supergroup. A. Skull of the procolophonid reptile Hypsognathus; B. Skull of the sphenodontid reptile cf. Sigmala; C. Skull and dorsal armor of Stegomus arcuatus (scale is 1 cm); D. Common Connecticut Valley footprint types: 1. Grallator spp. (including Anchisauripus and Eubrontes); 2. Anomoepus; 3. Batrachopus; 4. Otozoum (left pes and left and right manus). Scale is 1 cm for 1-3, 5 cm for 4. E. Possible appearance of some Connecticut Valley trackmakers: 1. Sphenodontid reptile; 2. Large, carnivorous theropod dinosaur, producer of large Grallator spp. tracks; 3. Small, carnivorous theropod, responsible for small Grallator spp. tracks; 4. Small ornithischian dinosaur, producer of Anomoepus tracks; 5. Crocodilomorph maker of Batrachopus tracks. All after Olsen (1980, 1988). See text for descriptions.

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