PITTSBURGH GEOLOGICAL SOCIETY

OCTOBER 18, 2017

Social hour	**6:00 PM**
Dinner	**7:00 PM**
Program	**8:00 PM**

Dinner costs
$30.00 per person
$10.00 student member

Reservations
Email your name and number of attendees in your party to:
pgsreservations@gmail.com

You can also reserve and pay via PayPal on:
https://www.pittsburghgeologicalsociety.org/

Location
Foster's Restaurant, Foster Plaza Bldg. 10, GreenTree PA

Proterozoic Geology Exposed in the Late Paleozoic Allochthon of the Appalachian Blue Ridge, Maryland-North Carolina

Basement Rock Beneath the Cambrian Unconformity is Messy in the Blue Ridge but Appears to be Clean under Pittsburgh

2017 PGS Appalachian Focus Lecturer

Dr. Scott Southworth

United States Geological Survey

Deadline for reservations is noon Monday, Oct 16.

SPEAKER ABSTRACT

Research in the last 30 years in the Blue Ridge allochthon has defined a complex Mesoproterozoic-Neoproterozoic history related to several Wilson Cycles that predate the Cambrian unconformity. The allochthons were emplaced from the Devonian to the Permian, associated with the contractional Alleghanian orogeny. Cenozoic erosion provides our insight of the rocks to compare to what is known about the basement beneath the Appalachian basin under Pittsburgh.

Mesoproterozoic plutonic rocks record at least 3 orogenic phases related to the amalgamation of the supercontinent Rodinia, which may have been the contractional orogeny of ancestral eastern North America and western South America. This was a long hot orogeny that may have persisted ~300 my and mostly under granulite-facies conditions. The recognition of sedimentary paragneisses requires several episodes of subduction. ~170 my missing record was followed by volcanism, sedimentation, and plutonism associated with crustal extension from ~780-555 Ma. Complex arrays of deposits reflecting spatial and temporal variations along and across strike define specific basins that predate the formation of the Iapetus Sea and formation of oceanic crust.

The landscape was mostly beveled and buried by sandy deposits on a subsiding Coastal Plain margin in the earliest Cambrian. Transgression of the basal clastic rocks above The Great Unconformity deposited Middle Cambrian sandy deposits on basement beneath the Appalachian Basin, younging westward across the craton as a function of subsiding crust and rising sea levels. Growing evidence of an extensional event post-middle Cambrian in the Blue Ridge, Rome trough, and Ouachita Mountains require a revised interpretation of the “passive margin”.

General palinspastic reconstruction of the late Paleozoic allochthons support a complex array of crustal basement of Laurentia, which is supported by regional gravity and magnetic image data. Little is known of the basement beneath the Appalachian Basin under Pittsburgh, but it appears to lack the diverse suites of Late Neoproterozoic-Early Cambrian rocks preserved in the hinterland.

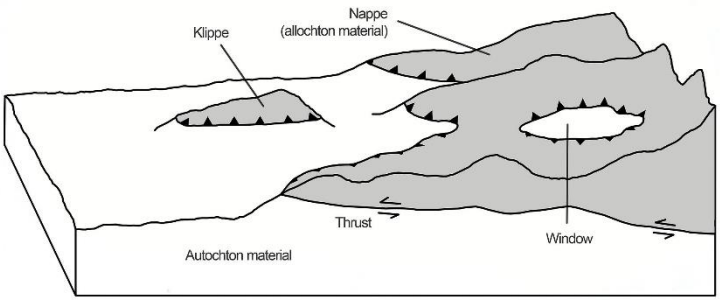
SPEAKER BIOGRAPHY

Scott Southworth has worked 30 years in the Blue Ridge during his 37 years at USGS. He was exposed to the wonders of the Blue Ridge while attending Madison College/James Madison University when Gerald Ford and Jimmy Carter were Presidents. He attended the University of Maryland while Ronald Reagan, George H.W. Bush, and Bill Clinton were Presidents, and his thesis was on a unique fault in the northern Blue Ridge.

Scott migrated south to the Great Smoky Mountains, then north to Shenandoah National Park, and returned to the south where he will complete his civil service in the Mount Rogers National Recreation Area, where he hopes to soon recreate.

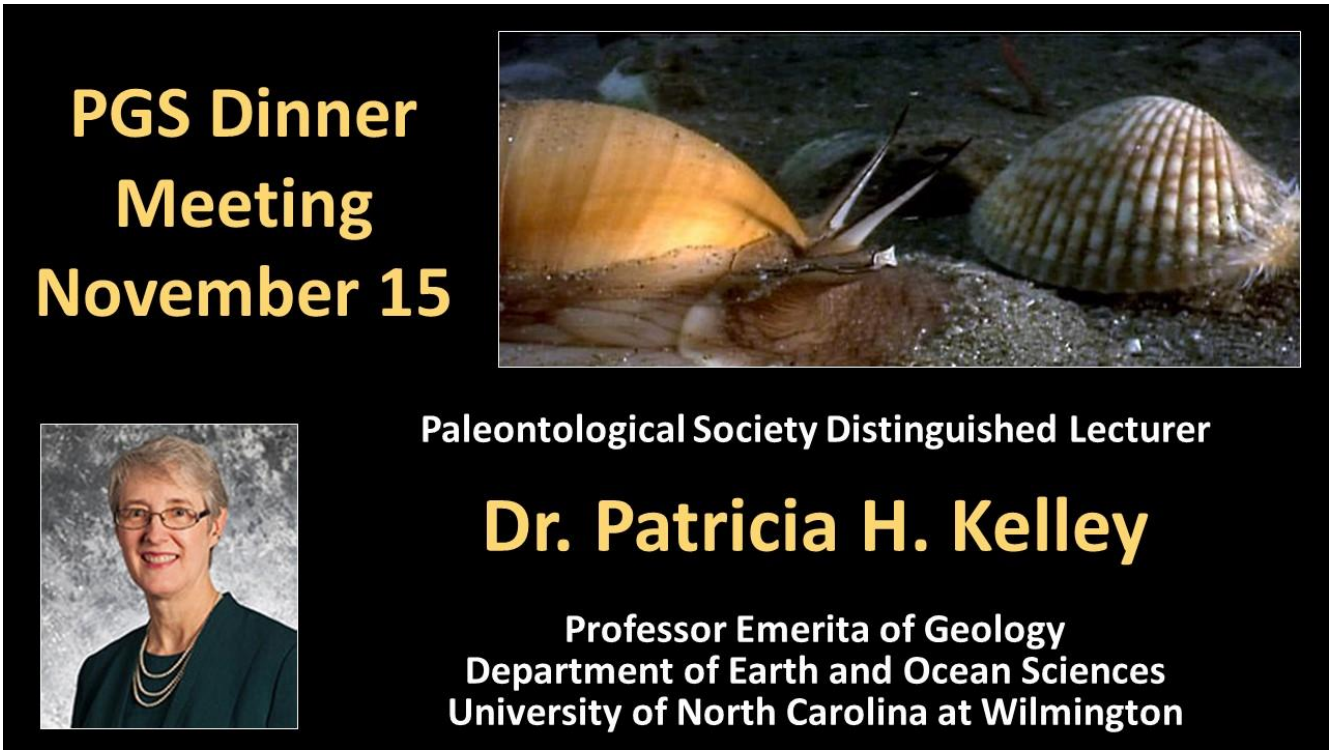
About This Month's Cover Image

Linville Falls in North Carolina is one of the most photographed sites in the Blue Ridge. Located in the Pisgah National Forest, the 90-foot upper falls are formed when the Linville River plunges through a resistant layer of Proterozoic gneiss, schist and granite. These one billion-year-old Grenville basement rocks were thrust above late Proterozoic meta-sandstones during the Alleghenian Orogeny. The fault contact can be seen in the cliffs behind the falls. This photograph of Linville Falls was taken on Nov 12, 2006 and posted to the image sharing site Summit Post.org by dwhike (http://www.summitpost.org/linville-falls-nc/243276).

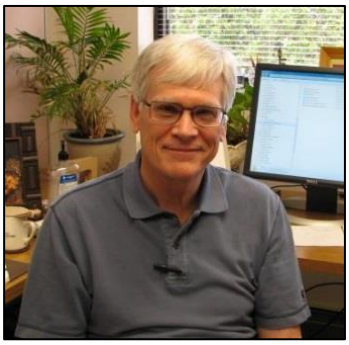


The Linville Falls Thrust forms part of the border of the famous Grandfather Mountain Window. This classic structural feature, also known as a fenster, exposes younger rocks of the lower thrust plate through an erosional 'donut hole' in the older rocks of the upper thrust plate.

Preview of our Next Meeting



PRESIDENT'S STATEMENT



I moved to Pittsburgh in late November of 1981 and very quickly appreciated how fond and proud the "natives" were of their town. I was advised by my parents, for instance, that if I asked for driving directions when negotiating the area's bewildering network of roads I should expect the use of landmarks, not street names. I also heard on several occasions the observation that, yes, Pittsburghers will relocate when necessary but leave their hearts here and often return at the first opportunity. The reason, it is said, is close family and community bonding. I believe it—and would add the matter-of-fact, no-big-deal courtesy and generosity commonly practiced among friends and strangers alike.

But it can't be the weather that warms their hearts. True, your risk of catching skin cancer may be lower here than at other places; but there are strings of days over which you might forget the color of the sun and the rare appearance of sunny, mild-temperature, breezy weather may actually be stressful, pressuring you to get the most out of it before it's gone. But then we normally don't get the real bad stuff, do we…like hurricanes. From late August through September Class-4 Hurricanes Harvey, Irma, and Maria made a mess of parts of Texas and Florida and all of Puerto Rico. And while we here are thankful not to contend with nature's wrath to such a degree, the people that are affected by the storms have our thoughts, prayers, and donations. I expect a small silver lining: plenty of work for environmental and engineering geologists towards community and economic restoration and making or improving preparations for "the next time."

Issues like natural catastrophic events and climate change are, of course, not the only problems we geologists face. Recently the Board of Directors decided to more pro-actively solicit from the PGS membership ideas for speaker topics at the monthly seminars and themes/itineraries for the annual field trip. Offers to help contact speakers or coordinate the trip will also be sought. You should see a bullet to that effect in this and future newsletters. We are also soliciting candidates to serve as the PGS liaison to the Covestro Pittsburgh Regional Science and Energy Fair. Steve McGuire is taking a bow after many years of effective service in this role. Another opportunity to contribute to the Society's outreach initiatives is offered by the Jefferson County History Center. The director, Ken Burkett, has asked for help updating the Center's geological exhibits. You are encouraged to contact Mr. Burkett directly if you wish to volunteer your expertise and time. Finally, 2020 will be our Society's 75th Anniversary. That may seem pretty distant into the future but, take it from me; the beginning of the three plus years I served on the Board hardly seem distant in the other direction. So I encourage you to let us know if you have any thoughts about how to celebrate our organization's history over the past three quarters of a century.

I want to take this opportunity to express gratitude on three counts. Many of you are aware that part of PA House Bill 218 provides for a reduction in funding to the Pennsylvania Geological Survey. Several PGS corporate and individual members wrote letters to Harrisburg urging against it. I also wish to express sincere thanks to the anonymous donor who made a ten thousand dollar ($10,000) donation to the PGS Community Foundation Endowment Account. Finally, I'm much appreciative of Dan Harris' interest in being our new Director at Large. He will replace Mark Barnes, who is unable to fit PGS activities into his busy schedule. Thank you, Dan, and welcome aboard!

Speaking of funds, November, the month we contact current and potentially new sponsors for financial support, is only a month away. We continue to be blessed by generous contributions in the past. I hope the trend will continue, so that PGS will go on serving the geological profession and surrounding community in the indefinite future.

Peter R. Michael

President

PGS AWARDS PRESENTED AT AAPG EASTERN SECTION MEETING IN MORGANTOWN, WV

PGS had a prominent place at the recent AAPG Eastern Section meeting in Morgantown, WV in September. The second ***Pittsburgh Geological Society Award for Best Presentation on Appalachian Geology***, chosen by judges at the 2016 meeting in Lexington, KY, was presented at the 2017 meeting to David R. Blood of EQT Production Co. for his oral presentation, "*Redox conditions during deposition and early diagenesis of the U. Ord. Point Pleasant Ls. of southwestern PA and northern WV: Insights from pyrite framboids and trace elements"*. David also won the ***A. I. Levorsen Memorial Best Paper Award*** for this talk.

AAPG ES President John Hickman and AAPG ES Honors and Awards Chair Joan Crockett (left) presented both the A.I. Levorsen Memorial Best Paper Award and the PGS Award for Best Presentation on Appalachian Geology to David R. Blood, EQT Production Co. Albert D. Kollar (right) represented PGS.

AAPG ES President John Hickman (left) and AAPG ES Honors and Awards Chair Joan Crocket (right) presented the George V. Cohee Public Service Award to Albert D. Kollar.

In addition, our own Albert D. Kollar, three-term past president of PGS and current chair of the PGS Awards Committee, won the ***George V. Cohee Public Service Award.***

The award was presented "*In recognition of his passionate enthusiasm over 40 years of contributions in sharing geology with the public through field trips, presentations, research, and leadership*."

Congratulations to David and Albert on jobs very well done!

GEOLOGICAL EVENTS

GEOPHYSICAL SOCIETY OF PITTSBURGH

October 3, 2017
"Seismic-Based Porosity Prediction in the Silurian Niagaran Formation Reefs of Northern Michigan: An Integrated Case Study" presented by Doug Paul, SeisWare Inc

Cefalo's Banquet & Event Center, Carnegie PA

ASSOCIATION OF ENGINEERING AND ENVIRONMENTAL GEOLOGISTS, GREATER PITTSBURGH CHAPTER

October 12, 2017
Remediation Workshop (Half-day, 4 CEU) presented by Enviroworks

Crowne Plaza Pittsburgh West, Green Tree PA

HARRISBURG GEOLOGICAL SOCIETY

October 12, 2017
"The Ancient Forests of Gilboa in the Catskill Mountains of New York State" presented by: Professor William Stein, Ph.D, Binghamton University (SUNY)

AEG Offices, Harrisburg PA

OHIO GEOLOGICAL SOCIETY

October 19, 2017
"Structural Control of the Point Pleasant Formation Deposition and Production" presented by Mr. Devin Fitzgerald, EMF Geoscience

Holiday Inn Columbus-Worthington (lunch meeting)

ASCE PITTSBURGH SECTION - GEO-INSTITUTE

October 19, 2017
"Performing GeoHazard Assessments for Infrastructure" presented by Martin Derby, Golder Associates

Gaetano's Restaurant, Pittsburgh PA

The Pittsburgh Geological Society is delighted to welcome the following new student members to the society:

From Clarion University of Pennsylvania:

Thomas P. McCloskey

From Slippery Rock University of Pennsylvania:

Samuel V. Hone
Trisha J. Pipchok
Sarahmay K. Schlea

Welcome to the society!

UPCOMING MEETINGS OF INTEREST TO PGS MEMBERS

October 23, 2017

SPEE Monograph 4 Short Course

Estimating Ultimate Recovery of Developed Wells in Low-Permeability Reservoirs

Hilton Garden Inn, Canonsburg PA

Don't miss an opportunity to attend this highly popular class with Dr. W. John Lee, Professor of Petroleum Engineering at Texas A&M University. John holds BS, MS, and PhD degrees in chemical engineering from the Georgia Institute of Technology. He worked for ExxonMobil early in his career and specialized in integrated reservoir studies. He later joined the Petroleum Engineering faculty at Texas A&M, and became Regents Professor of Petroleum Engineering. He served as an Academic Engineering Fellow with the U.S. Securities & Exchange Commission (SEC) in Washington during 2007-2008, and was a principal architect of the modernized SEC rules for reporting oil and gas reserves.

This one-day course will provide fundamental background information and concepts to forecast production for developed wells in unconventional, low-permeability reservoirs as covered in SPEE Monograph 4.

For more information or to register, visit:

https://secure.spee.org/civicrm/event/info?id=140

October 19-20, 2017

SME/PCMIA Annual Joint Meeting

The Pittsburgh Section of the Society for Mining, Metallurgy, and Exploration, Inc. will hold their annual joint meeting with the Pittsburgh Coal Mining Institute of America at the Hilton Garden Inn in Canonsburg PA. Among the topics to be presented are:

- Conservation of Northern Long-Eared Bat Habitat at an Aggregate Mine in Westmoreland County, Pennsylvania
- Rare Earth Elements in Coal
- Steep Slope Erosion and Sedimentation Control at a Limestone Mine in West Virginia
- Coal Basin Assessments; Economics Evaluation Approach
- Enhanced Microbial Coalbed Methane Generation: Field Site and Diffusive Sampler Investigations
- The Importance of Mine Gas Analysis Databases in Managing Underground Scenarios
- Encouraging Sustainable Development Through Mine Finance
- Best Practices in Surface Mining of Limestone in Western Pennsylvania

For more information or to register, visit:

http://community.smenet.org/pittsburgh/home


American volcanologist Frank A. Perret uses an improvised "geophone" in Italy circa 1907.

PGS Wants to Hear from You!

The Board of Directors invites all members of the Pittsburgh Geological Society to submit their ideas for the following:

- Speakers and/or topics for future monthly meetings
- Ideas for future PGS annual spring field trips
- Volunteers willing to lead or help lead annual field trips
- Suggestions for ways to mentor PGS student members
- Volunteers to help mentor PGS student members

Send your feedback to any member of the board of directors (see page 14 for our email links) or submit it using the contact form on the PGS website.

THE ORIGIN OF WESTERN PENNSYLVANIA PLACE NAMES


The Homestead Works in its heyday in the early 1900s.

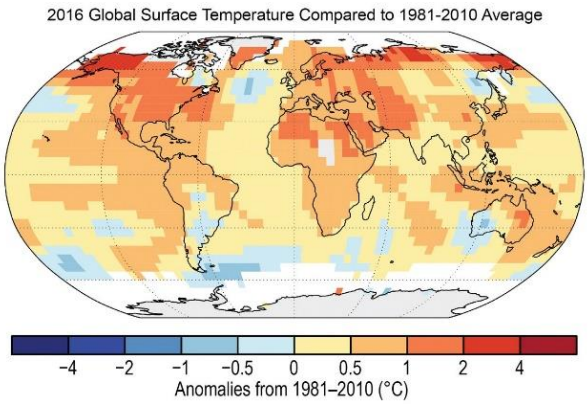
At some point after the American Revolution, John McClure purchased and farmed some land in Mifflin Township, Allegheny County, at the big bend in the Monongahela River about seven miles southeast of Pittsburgh. He called his land “Amity” or “the Amity Homestead”. In 1871, McClure’s grandson sold 113 acres of the land and a town was laid out in lots for sale, advertised as a future pleasant residential suburb of smoky, industrial Pittsburgh. The date of the sale, September 17, 1871, marked the founding of the town of Homestead.

The first steel mills were built in 1879, and the first steel produced in 1881, and by September of that year the Pittsburgh Bessemer Steel Company was producing 200 tons of rails per day. A strike by the Amalgamated Association Workers in 1882 alarmed some stockholders enough that they sold the mill to the Carnegie Steel Company in 1883. The Homestead Works was, at the time, the best-equipped plant of its size in the country, and the valley of the Monongahela soon became one big factory centered around the latest steel-making technology.

Andrew Carnegie provided Homestead with a grand, new library, broad streets with space for two lanes of traffic and parking on the sides, and green space (an unusual aspect of early 20th century American cities). Homestead, and the other steel-manufacturing towns of the Mon Valley, provided much of America’s steel for over a century. But eventually, steel could be made more cheaply elsewhere, and so America’s steel industry declined, as did Homestead. The Homestead Works stopped producing steel in 1986 and was demolished in the early 1990s, replaced in part by The Waterfront shopping district in 1999.

DID YOU KNOW . . . ?

According to a report released in August of this year, the global land and ocean surface temperature of Earth was between 0.45º and 0.56ºC (32º and 33ºF) above the average for the years 1981 to 2010. The temperature was also more than 1ºC (34ºF) above the pre-industrial average. Since the 2015 Paris Climate Agreement set a goal of capping warming at 1.5ºC above the pre-industrial average, we're getting close. It doesn't help that 2016 was the third consecutive year of record warmth, according to the National Oceanic and Atmospheric Administration (NOAA).

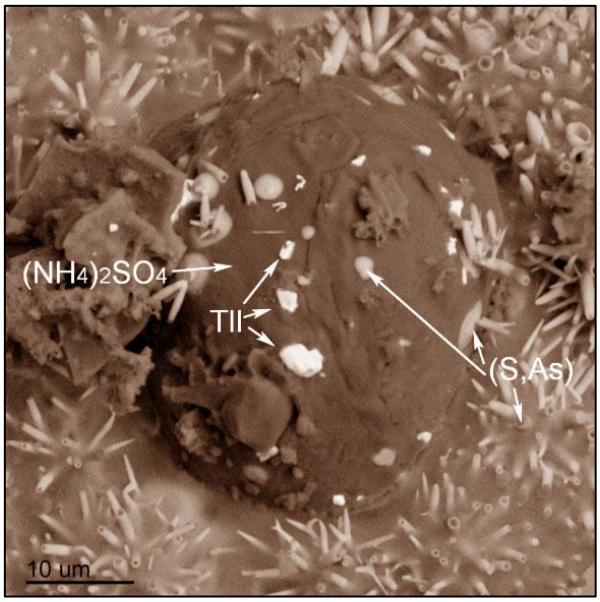


2016 was the warmest year on record.

(**http://www.cnn.com/2017/08/10/us/noaa-2016-climate-change-report/index.html**)

An international team of geologists led an Australian geologist has discovered a new thallium mineral — nataliyamalikite, named for Dr. Natalja Malik, a researcher at the Institute of Volcanology and Seismology in Petropavlovsk-Kamchatsky in the Kamchatka Peninsula of Russia. Nataliyamalikite is the orthorhombic form of thallium iodide (TII). It occurs as pseudo-cubic nanocrystals at Kamchatka's Avacha volcano, which has active fumarolic vents with temperatures exceeding 1,148ºF.

The scientists who discovered the new mineral believe its discovery will lead to better understanding of how metals are extracted from deep-seated sources within the Earth and concentrated at shallow depths to form economic ore deposits. It will provide a unique insight into the processes responsible for the geochemical evolution of the planet.



Nataliyamalikite (TII) grains on the mineral mascagnite $(NH_4)_2SO_4$.

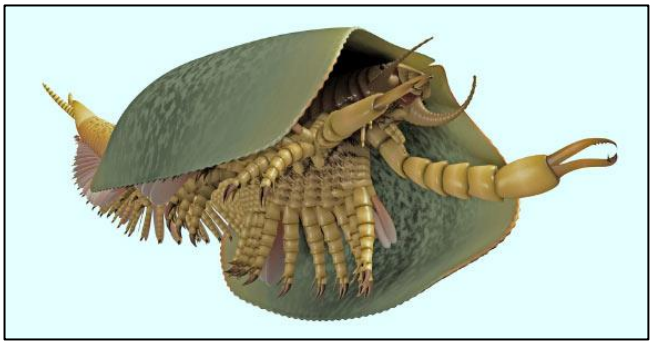
The researchers combined state-of-the-art sample preparation, along with the capabilities of the Australian Synchrotron (a 3 GeV national synchrotron radiation facility in Melbourne, Victoria, to obtain the crystal structure of the mineral. Since nataliyamalikite grains are tiny and almost invisible, this was incredibly difficult. The mineral and its name were recently approved by the IMA Commission on New Minerals and Mineral Names.

(**http://www.sci-news.com/geology/new-mineral-nataliyamalikite-05017.html**)

A team of Canadian paleontologists has discovered a new fossil species named *Tokummia katalepsis* that sheds light on the origin of the most diverse and abundant group of animals, the mandibulate arthropods. The mandibulates include crustaceans, insects, and myriapods.

Tokummia katalepsis is a large bivalved arthropod from the Burgess Shale of British Columbia, Canada that, for the first time, defines anatomy of

the early mandibulates in detail. The animal had more than 50 small segments covered by a broad two-piece shell-like structure called a bivalved carapace. Despite their very large diversity today, the origin of mandibulates had been a mystery. Until the discovery of the new fossil, scientists had little to go on as to what the first arthropods with mandibles might have looked like. *Tokummia* was a bottom-dweller, much like modern lobsters or mantis shrimps, and at more than three inches long was among the largest of the known Cambrian predators. It is also one of the best preserved soft-bodied arthropods from the Burgess Shale.



Artist's conception of *Tokummia katalepsis*.

Analysis of several fossil specimens showed that *Tokummia katalepsis* had broad, serrated mandibles, as well as large, specialized anterior claws, which are typical features of modern mandibulates. The pincers were large, but delicate and complex, so they might have been too fragile for handling shelled animals. They might have been better adapted for capturing large, soft-bodied prey hiding in mud. The mandibles would have been a revolutionary new tool for cutting flesh into small, easily digestible bites.

A very important aspect of the animal was the inclusion of tiny projections on the limb bases called endites that occur in the larvae of certain crustaceans. These are now thought to have been critical innovations for the evolution of the various legs of mandibulates, and even for the mandibles themselves. The multi-segmented body of *Tokummia* is reminiscent of the myriapod arthropods, the group that includes centipedes, millipedes, and their relatives, as is the lack the second antennae typically found in crustaceans.

In addition, the discovery of *Tokummia* resolves some problems of the affinities of other enigmatic Burgess Shale fossils. The researchers believe that *Tokummia* and fossils such as *Branchiocaris*, *Canadaspis* and *Odaraia* form a group of crustacean-like arthropods that can now be placed at the base of all mandibulates arthropods.

(**http://www.sci-news.com/paleontology/tokummia-katalepsis-cambrian-marine-predator-04820.html**)

Israeli scientists have uncovered what may provide a quantitative assessment for the commencement of significant human impact on the Earth's geology and ecosystems. The scientists found the evidence, dating to at least 11,500 years ago, in a core sample retrieved from the Dead Sea that recorded basin-wide erosion rates incompatible with known tectonic and climatic regimes of the period.

The Dead Sea in Israel.

The core sample contains a sediment record of the last 220,000 years, and the newly-discovered erosion occurred during the Neolithic Revolution when human cultures transitioned from hunting and gathering to agriculture and settlement, which resulted in an exponentially larger human population on the planet. All of this resulted in deforestation and changes in vegetation that resulted in intensified erosion of the surface and increased sedimentation, such as that discovered in the Dead Sea core sample. The scientists noted, for example, a sharp threefold increase in

fine sand carried into the Dead Sea by seasonal floods, intensified erosion that is incompatible with tectonic and climatic regimes during the Holocene.

(**http://www.sci-news.com/othersciences/anthropology/evidence-humans-impact-geological-processes-israel-04922.html**)

Andrew Snelling, an Australian geologist and director of research at Answers in Genesis, a "Christian science" group that believes in the literal interpretation of the Bible, has been given permission to collect rock samples from the Grand Canyon. Snelling, who is trying to prove the existence of Noah's flood, had sued the US Department of the Interior in May alleging religious discrimination after his proposal to collect 50 to 60 rock samples had been rejected for lack of scientific merit. While his lawyers argued that the park violated a recent Donald Trump executive order expanding religious freedom, Snelling was telling Australian newspapers that his request was declined "because they didn't like the question I was asking".

The Grand Canyon at the level of the Colorado River

Most geologists agree that scientific evidence disputes Snelling's hypothesis that the Grand Canyon was carved by the great flood. There's nothing unusual about the rocks of the canyon; they show no evidence of catastrophe. Geologists also agree that the canyon was carved by the Colorado River about 5 ma. The oldest exposed rocks in the canyon are about 2 ga and the youngest are about 270 ma. Snelling apparently wants to show that all the rocks formed very quickly over the past 10,000 years, rather than slowly over geological times, with some kind of deluge. Answers in Genesis believes the Bible's story of creation is historical and not a myth, and have constructed a replica Noah's Ark in Williamstown, Kentucky. The Department of the Interior approved Snelling's project in July after he agreed to drop his lawsuit.

(**https://www.theguardian.com/world/2017/jul/07/australian-creationist-uses-trump-order-to-get-permission-to-take-rocks-from-grand-canyon**)

Researchers at the University of Oxford in England think episodic volcanism probably played a key role in the end-Triassic mass extinction 201.5 ma. One of Earth's five largest mass extinctions, the end-Triassic die-off set the stage for the rise of the dinosaurs. Large crocodile-like reptiles, numerous marine invertebrates, and some land plants, among other biota, disappeared while the early dinosaurs survived this event and went on to fill in many of the niches left vacant by the extinction. Early mammals and amphibians also survived and thrived.

It has long been thought that the release of volcanic CO_2 into the atmosphere was at least a major contributing factor to this extinction event. Although Late Triassic volcanic rocks occur on four continents, representing the Central Atlantic Magmatic Province, or CAMP, no one was certain of the global extent of the volcanism. Volcanoes emit mercury gas emissions that can spread globally through the atmosphere before becoming incorporated in sediments through precipitation, so existing sedimentary rocks that had been deposited during a large volcanic event should have unusually high mercury content. The Oxford researchers, therefore, decided to investigate the mercury content of sedimentary rocks deposited during the extinction event. They studied six Late Triassic sedimentary formations from Europe, Africa, and North and South America, analyzing the mercury contents.

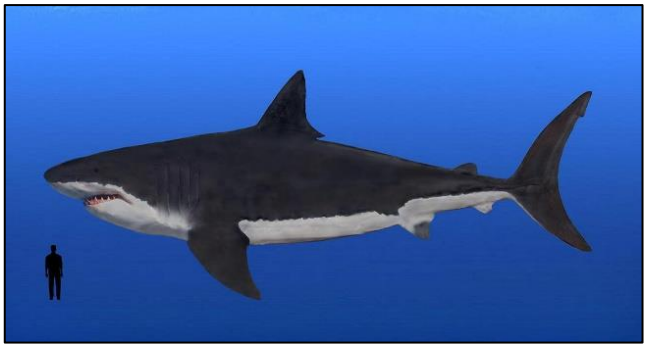
Did periodic global volcanism set the stage for the rise of the dinosaurs?

. Five of the six analyses indicated there was a large increase in mercury content starting at the end-Triassic extinction horizon, with additional peaks occurring between the extinction horizon and the Triassic-Jurassic boundary about 200,000 years later. The higher mercury levels also occurred contemporaneously with periods of increased atmospheric CO_2 concentrations from volcanism that had been established previously. The results of this study support the concept of repeated episodes of volcanic activity at the end of the Triassic, with the onset of volcanism occurring during the end-Triassic extinction, and strengthens the proposed tie between the extinction and volcanic CO_2.

(**http://www.sci-news.com/geology/end-triassic-volcanism-dawn-dinosaurs-04974.html**)

And speaking of extinction events, a previously unrecognized extinction that saw the demise of almost 1/3 of all large marine mammals occurred around 2-3 ma, according to a team of German paleontologists. Warm-blooded animals such as manatees and baleen whales were more likely to become extinct. The team analyzed fossils of Pliocene and Pleistocene marine megafauna and showed that the marine megafaunal communities that occurred during the course of human evolution were already greatly diminished in diversity. Marine mammals lost 55% of their diversity, whereas sea turtles lost 43%, sea birds lost 35%, and sharks lost 9% (this was when the gigantic shark, *Carcharocles megalodon*, disappeared from the fossil record).

The researchers concentrated on shallow coastal shelf areas, analyzing the effects that the loss of entire functional entities had on coastal ecosystems. Functional entities are groups of animals not necessarily related biologically, but which share similarities in how they function within an ecosystem. The researchers found that seven functional entities went extinct in coastal waters during the Pliocene. Although the loss of seven functional entities, and 1/3 of the species, is relatively small for a mass extinction event, the loss still caused an important erosion of functional diversity. There was a 17% loss of the total diversity of ecological functions in the ecosystem; there was also a 21% change in functions. Common predators died out, replaced by new species that required the biota to adjust.



The gigantic Pliocene shark, Carcharocles megalodon, with an average human for scale.

So what happened? The researchers found that, at the time of the extinction, coastal habitats were reduced as the result of sea level fluctuations. The team suggested that physical factors such as altered currents, along with the sudden loss of the productive coastal habitats, at least contributed to the extinction. Their results indicate that ancient marine megafaunas were more vulnerable to global environmental changes than had been assumed previously. And, overall, levels of diversity seen during the Pliocene have not been reached since.

(**http://www.sci-news.com/paleontology/mass-extinction-marine-megafauna-pliocene-04988.html**)

PGS WEBSITE OF THE MONTH

National Science Foundation
WHERE DISCOVERIES BEGIN

https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=106951

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Officer Contacts: If you wish to contact a current PGS Officer, you can email Peter Michael, President, at shabell9@comcast.net; Tamra Schiappa, Vice President and Speaker Coordinator, at tamra.schiappa@sru.edu; Kyle Fredrick, Treasurer, at fredrick@calu.edu; and Ken LaSota, Secretary, at lasota@rmu.edu.

Memberships: For information about memberships, please write PGS Membership Chair, PO Box 58172, Pittsburgh PA 15209, or e-mail jharper.pgs@gmail.com. Membership information may also be found at our website: www.pittsburghgeologicalsociety.org.

Programs: If you would like to make a presentation at a PGS meeting or have a suggestion for a future speaker, contact Tamra Schiappa, Program Chair at tamra.schiappa@sru.edu.

Newsletter: To contact the Newsletter Editor, Karen Rose Cercone, with questions or suggestions for articles, job postings or geological events, please email kcercone@iup.edu.

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Fun Fact Having Nothing to Do with Geology

"Facebook Addiction Disorder" is recognized by psychologists as an actual mental disorder.

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