Rochester Academy of Science

BULLETIN

"An organization of people in the Natural Sciences"

February, 2015 - Vol. 69, #2

President's Message

One of the benefits and pleasures of being an academy member is hearing interesting talks and meeting people doing research. At a fossil Section meeting a few months ago a graduate student from Syracuse University shared with us his research with bivalves. We examined some extinct and extant study specimens and learned about his challenges investigating environmental controls that influence clam longevity. I was inspired to read about research involving clams and to create a short introduction on this for the Bulletin.

Not only does the Academy recognize the scientific research of students at our meetings and the grand Fall Paper Session, but we also support undergraduate projects with grants. You can read about the latest grants awarded on page 2 of this Bulletin.

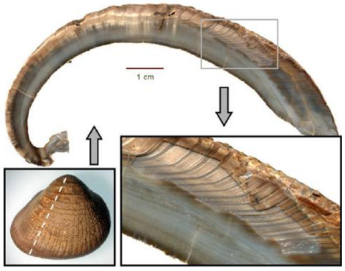
Jutta Siefert Dudley,
President RAS

LONG LIVED CLAMS A FOCUS OF RESEARCH

Amazingly, some clam species hold longevity records for non-colonial sea critters. *Arctica islandica* for example, can live several hundred years. Researchers from the University of Bangor (Wales, UK), dredging for live samples of the clam, off the seabed of Iceland, measured the ages of many specimens and discovered one clam, affectionately named "Ming," was 507 years old! Commonly known as the ocean quohog, this species is a popular fisheries industry catch. Now you know, the clams in your chowder could be very old!

Modern Arctica islandica collected near Caernafron, United Kingdom. Photo credit David Moss.

A.islandica and other centurion clams are of interest to climate researchers because they are useful as proxies for past climatic variables. Their skeletons are historic archives of clues locked in the carbonate materials that accrete as seasonal bands. The band patterns may be matched, like tree ring patterns, to create long records that can be used along with isotopic compositional studies to infer past climatic conditions. For example, the Bangor researchers established a 1357-year record for Iceland from which sea temperatures and salinity can be inferred, improving the story of ocean circulation and changes in climate.



Cross section and close up of growth bands from Cucullaea raea.

From Ivany, L.C., 2012. Reconstructing Paleoseasonality from Accretionary Skeletal Carbonates-Challenges and Oppoprtunities. In L.C. Ivany, and B.T. Huber (eds), Reconstructing Earth's Deep-Time Climate: The State of the Art in 2012. Paleontological Society Papers, v. 18.

The lives of centenarian clams raise questions about environmental factors that

influence longevity. High latitudes and cold temperatures appear to relate to a long life, yet the warm, "greenhouse" paleoenvironments of the Eocene and Cretaceous produced centenarian sea animals at high latitudes. When researchers at Syracuse University analyzed isotopic ratios of C and O along growth bands of *Cucullaea raea* , an Eocene bivalve from Antarctica, they unexpectedly discovered the clams had been growing during the dark, winter months. That this would happen during a time of limited nutrient intake is leading to interesting hypotheses and more research.

To learn more about the application of clam research to paleoclimate, longevity, and other studies, read about the work of Linda Ivany and her students at Syracuse University (http://paleoecology.syr.edu/) and the work of Paul Butler's research group at Bangor University (http://www.bangor.ac.uk/oceansciences/research/php/theme.php?project=524).

Jutta Dudley
President, Rochester Academy of Science

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STUDENT RESEARCH GRANTS AWARDS

The Grants Committee has completed its review of the 2014-2015 Student Research Grant proposals. This year, we had a challenging time making a decision on the awards. The proposals were all very good with a variety of research topics and some most interesting questions to explore. The committee was disappointed, however, that so many proposals had good ideas but were not well-written or the applicant failed to follow directions in the Request For Proposals. The grant review committee recommended partial funding for most of the projects.

Emily Artruc from Syracuse University was awarded $200 for her proposal, "Measuring Growth Rate of the Heteromorph Ammonite *Diplomoceras maximum* Using Stable Isotopes of Accretionary Shell Carbonate." Michael Breen, University of Rochester was awarded $499.73 for his proposal, "Replication-competent influenza A and B viruses expressing a fluorescent "Timer" protein." Joshua Cho, University of Rochester was awarded $200 for his proposal, "Estrogen-mimicking compound induces differential expression of long non-coding RNA to promote kidney cancer growth and metastasis." Mary Fisher, Cornell University was awarded $200 for her proposal, "Salinity, SNPs and genetic structure quantifying and modeling genetic differentiation of the eastern oyster (*Crassostrea virginica*) along an environmental gradient in the Delaware Bay estuary." Eric Grim, Syracuse University was awarded $200 for his proposal, "Synthesis of a Multifunctional Dicarborane Containing Dendritic Macromolecules for Boron Neutron Capture Therapy." Robert Katz, SUNY Oswego was awarded $163.99 for his proposal "Identifying juvenile archosaur (Reptilia; Archosauria) microfossils from the Ghost Ranch locality, NM, USA." Kareem March, Hartwick College was awarded $200 for his proposal "Purposeful biofilm disassembly with non-natural alkyl and aromatic D-Amino Acids." Rachel McClatchey, Houghton College was awarded $300 ($200 from the Grants Fund and $100 from the Life Science section) for her proposal "Genetic variability of cranberry, leatherleaf and purple pitcher plant in bogs of New York State." Anne Pysnik, Nazareth College was awarded $300 ($200 from the Grants Fund and $100 from the Life Science section) for her proposal "Hydroponic Removal of Bisphenol A Using Phytoremediation." Juliana Shaw, Rochester Institute of Technology, was awarded $200 for her proposal "Using biochemical techniques to determine the orientations of P6 in nontypeable *Haemophilus influenza."* Robert Swanda, Syracuse University, was awarded $100 for his proposal "Response of Cells and Biochemical Pathways to Biological Temperature Dependence." Allison Wilcox, Hobart and William Smith Colleges, was awarded $350 for her proposal "Mimicking the Intracellular Environment: Macromolecular Crowding's Influence on YADH Kinetics." Samuel Williams, Hobart and William Smith Colleges was awarded $100 for his proposal "Using stable carbon isotopes for quality control in the craft beer industry."

William Hallahan, PhD
Chair, Student Grants Committee

Events for February, 2015

For updates to events, check the Academy website, http://www.rasny.org, and Section websites.

Tues 3 FOSSIL SECTION MEETING

7:30 p.m. Brighton Town Hall Downstairs Meeting Room. The speaker for the evening will be a representative from the Paleontological Research Institute in Ithaca who will talk on the field of conservation paleontology. Refreshments will be served immediately following the talk. For more information, contact Dan Krisher at 293-9033.

Fri 6 ASTRONOMY SECTION MEETING

7:30 p.m.–10:00 p.m RIT, Gosnell Hall, Room A300. ASRAS General Members Meeting. The speaker will be Dr. Jen Connelly and her topic will be "Cosmic Nature versus Nurture: Studying Galaxy Evolution in Groups".
For more information, contact Valerie Rapson at (585) 301-3424.

Tues 17 MINERAL SECTION MEETING

7:00 p.m.-9:00 p.m in the Downstairs Meeting Room of the Brighton Town Hall, 2300 Elmwood Ave, Rochester, 14618. Program to be announced. For more information contact Stephen Buschaert at 732-5321.

Sat 21 LIFE SCIENCES HERBARIUM WORKSHOP

10:00 a.m.-2:00 p.m. Life Sciences section will hold a workshop at the RAS Herbarium, located in the basement of the Rochester Museum and Science Center (RMSC). We will continue work on replacing torn and damaged genus folders, as well as repairing specimens as needed. It is a great way to see interesting plants from the Rochester region and around the world! No experience needed! The Museum café is open until 2 pm, if you wish to buy lunch. If you plan to attend, please send an RSVP to Elizabeth Pixley. Then, at RMSC, go to the front desk and ask staff person to call ext. 368, phone in the Herbarium. For more information, contact Elizabeth Pixley, herbarium curator (334-0977 or epixley@rochester.rr.com).

Sat 21 LIFE SCIENCES

2:30 p.m. After the Herbarium Workshop at RMSC we will meet at the Nature Center parking lot at Mendon Ponds Park for an afternoon of tree identification with Karen Wolf. For more information contact Larry Hirsch at 429-6199.

Wed 18 RAS BOARD MEETING

7:00 p.m. Brighton Town Hall, Stage Conference Room.

ONGOING EVENT

ASRAS will operate the telescope, or one on the sidewalk, at Strasenburgh Planetarium on mostly clear Saturday nights. Contact Jim Seidewand at (585) 703-9876. Note: We have a new Celestron 11 inch SCT permanently mounted on the deck outside the Cave observatory. Come and check it out!

Peregrine falcon at Wild Wings poses for visitors at the January Winterfest in Mendon Ponds Park.
Photo by JSDudley

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