

EDUCATION

Notes From Underground

If you've ever wondered how caves form or why different minerals sometimes share the same chemical formula, dig into The Dynamic Earth, the Web version of geology exhibits at the Smithsonian Institution's National Museum of Natural History. Caves open because acidic ground water seeping through limestone gradually hollows out a cavern. The site descends beneath the surface to see how heat and pressure bend, fold, and cook rocks, often transforming their minerals. The recipe for turning basalt into greenstone, for example, requires between 2000 to 4000 atmospheres of pressure and a long bake at 350°C. You can also wander a gallery of rocks and minerals, such as this chunk of apophyllite and prehnite from Virginia (above). Launched earlier this year, the Web exhibit is evolving, and curators plan to add sections on plate tectonics and volcanoes and on the solar system.



www.mnh.si.edu/earth

RESOURCES

Wayward Worms on the Web

Many nematodes, such as *Acrobelles complexus* (below), are solid citizens that peacefully slurp up soil bacteria. Others are tiny terrors that victimize crops, domestic animals, and us. This trio of sites teems with information for aficionados of the ubiquitous worms.



At NEMBASE,* a genome database from the University of Edinburgh, U.K., you can analyze and compare DNA sequences from 10 parasitic nematodes that infest humans and other animals. The list of malefactors includes the worms behind the human diseases river blindness and filariasis, which can cause grotesque

swelling of the limbs. Link to the lab's home page for more information on the evolutionary relationships of these and other species.

Wriggle over to this site† from the University of Nebraska, Lincoln, to find descriptions of the 15 "least wanted" plant pest species, as well as accounts of common nematodes that assault crops such as corn and potatoes. Nematodes also plague insects, and some researchers are hoping to exploit the worms' hunger to control pests. Biocontrol is the subject of this site‡ from Ohio State University in Columbus. Gardeners will cheer the photos of insects falling victim to worm attack.

* nema.cap.ed.ac.uk/nematodeESTs/nembase.html

† nematode.unl.edu

‡ www.oardc.ohio-state.edu/nematodes

Send site suggestions to netwatch@aaas.org. Archive: www.sciencemag.org/netwatch

LINKS

Damage Report

The rumble of summer thunderstorms heralds relief from the heat for some people but disaster for others. Lightning kills around 75 people each year in the United States, while property damage from floods totals some \$4.5 billion. Societal Aspects of Weather from the University of Colorado, Boulder, rounds up scores of links that document and analyze the effects of floods, tornadoes, hurricanes, and other weather-related phenomena on people and the economy. Although some links are old, others steer you to up-to-date information that ranges from historical statistics on damage and death from hurricanes to this year's forecast for wildfire risk.

sciencepolicy.colorado.edu/socasp/toc_img.html



EXHIBITS

Delivering the Spark of Life

It looks like a hybrid between a sewing machine and a car's starter motor, but this contraption from the early 1930s (above) is the forerunner of today's miniaturized pacemakers and implantable defibrillators. New York City cardiologist Albert Hyman coined the term "pacemaker" to describe his invention for jump-starting the heart and restoring its rhythm. Learn more about the history of these devices at the Web exhibit Electricity and the Heart, sponsored by the North American Society of Pacing and Electrophysiology in Natick, Massachusetts.

A timeline highlights key findings since the mid-1800s, while features delve into advances such as Hyman's device, which delivered too little electricity to revive patients. Biographies—some with audio interviews—profile nearly 50 heart rhythm pioneers, such as Paul Zoll (1911–1999) of Beth Israel Deaconess Medical Center in Boston. He showed in 1952 that applying an electric current to the chest could spark the heart—surgery to expose the organ wasn't necessary. An historic film clip shows a patient living with a late-1950s machine. The device was the size of a microwave oven, and he couldn't stray beyond a 6-meter lifeline.

www.naspe.org/ep-history

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