the canisters, says Rashid Alimov of the St. Petersburg office of Bellona, a Norwegian environmental foundation. This is only the latest in a string of such incidents chronicled in a 24 November Bellona report.

The Arctic lighthouses have long been a bête noire for antiterrorism experts. When built in the 1970s, each RTG contained between 30,000 and 180,000 curies' worth of strontium, depending on the intended use. (Approximately 40,000 curies of strontium-90 was released during the 1986 Chornobyl explosion and fire.) With a half-life of 29 years, the strontium-90 in Russia's 1000-odd RTGs in operation or at large today remains highly radioactive—and highly vulnerable. "They're just sitting there ripe for the plucking," says health physicist Joel Lubenau, a senior adviser to the Center for Nonproliferation Studies at the Monterey Institute of International Studies in California.

IAEA deems the loose RTGs a grave threat. "This source is dangerous and one of the most worrying for us," says Abel Julio González, director of IAEA's division of radiation and waste safety. In January 2002 the agency launched an operation to hunt down abandoned RTGs in the Republic of Georgia (*Science*, 1 February 2002, p. 777). Later that year IAEA, Russia, and the United States inked a deal to work together to round up RTGs and other orphaned sources—including truck-mounted seed irradiators filled with cesium-137 powder—throughout the FSU, outside Russia. "My gut feeling is that we have identified most of the major sources," says González.

Dealing with derelict RTGs is a high priority, according to a new ranking by a team at Los Alamos National Laboratory in New Mexico (see table). Its September report also reveals that orphaned RTGs are not solely a Soviet legacy: Of 134 strontium-90 RTGs made in the United States, the report states, only 47 have been accounted for. Among other unsung threats, the Los Alamos team highlights new types of truck-mounted irradiators. One model "of particular concern," the report notes, is a 67-ton irradiator used for treating crops or for research purposes and made by the Beijing Institute of Nuclear Engineering. It contains a staggering 250,000 curies of cesium-137.

The Los Alamos report weights risk according to how vulnerable a source is to theft. That is what's particularly unnerving about the drama playing out in the rebel republic of Transdniester. The contraband had not been identified as *Science* went to press. What happened was "probably not malevolent," says González. Cold comfort, perhaps, considering the radioactive smorgasbord around the world that has yet to be secured.

–RICHARD STONE

INVERTEBRATE PALEONTOLOGY

Gutsy Fossil Sets Record for Staying the Course

Over the past half-billion years, evolution has dished up an almost endless variety of novelties: lungs, legs, eyes, wings, scales, feathers, fur. So when paleontologists find a creature that *doesn't* change, they take note.

Witness *Colymbosathon ecplecticos*. *Colymbosathon* was an ostracode: a tiny crustacean with a clamlike carapace. Fossil ostracode shells are so common and so varied that geologists use them to date and analyze rocks. On page 1749, however, paleontologists describe a much rarer specimen: one that reveals the oldest soft tissue known for an ostracode. The 425-million-year-old fossil preserves a jaw-dropping amount of detail, including gracile limbs used for swimming and the oldest penis in the fossil record. What's most amazing, ostracode experts say, is how eerily similar the soft-tissue anatomy is to that of modern relatives. "I was flabbergasted," says Koen Martens, a zoologist at the University of Amsterdam, the Netherlands.

The 5-centimeter-long specimen comes from a remarkable deposit of Silurian-age fossils in Herefordshire, U.K. The marine animals were buried in volcanic ash, then rapidly mineralized within nodules that preserved their bodies in three dimensions. A few years ago, a team of paleontologists—David Siveter of the University of Leicester, U.K.; Derek Siveter and Mark Sutton of the University of Oxford, U.K.; and Derek Briggs of Yale University—figured out a way to reveal the intricate detail. They grind the rock away, photographing polished cross-sections as they go. Then they assemble the digital images into a three-dimensional reconstruction, a technique that has already uncovered a strange, soft-bodied mollusk (*Science*, 23 March 2001, p. 2292), a king crab arthropod, and a bristle worm.

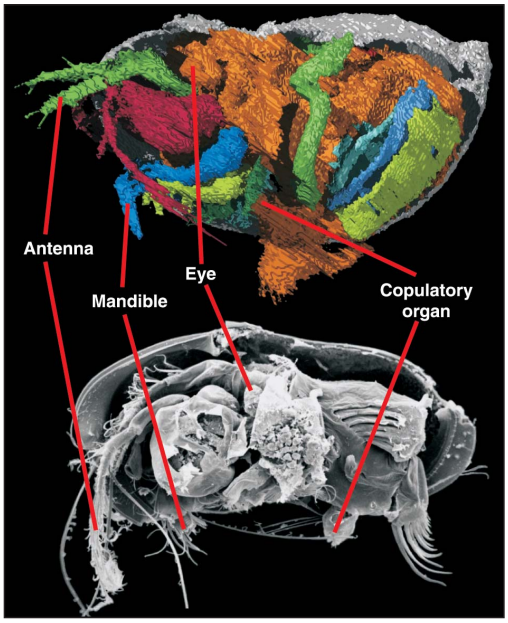
Colymbosathon is the latest wonder from this trove. "The whole animal is amazing," David Siveter says. "We've got something we could only dream about." Features include limbs used for sensing, feeding, and swimming; a "furca," probably used to grasp prey and carrion; and a stout copulatory organ. (The creature's name is Greek for "amazing swimmer with a large penis.") Six pairs of gills help peg it as a member of a living family called the Cylindroleberididae, David Siveter says.

Some ostracode specialists are stunned. "This is a demonstration of unbelievable stability," says Tom Cronin of the U.S. Geological Survey in Reston, Virginia. Whereas ostracodes diversified into some 33,000 living and extinct species, "these guys have just been plodding along totally unfazed."

Finding a modern cylindroleberid in the Silurian clashes with molecular data, which suggest that the group and related families originated relatively recently, says evolutionary biologist Todd Oakley of the University of California, Santa Barbara. There's no conflict for zoologist Anne Cohen, a research associate at the California Academy of Sciences in San Francisco, who thinks *Colymbosathon* actually belongs to a long-extinct family. In any case, the new fossil indicates that a basic ostracode body plan was already present in the Silurian. It could also help sort out evolutionary relationships of fossil ostracodes.

The Herefordshire specimens may reveal other long-lost evolutionary blueprints, says David Horne of Queen Mary College in London: "The probability that they will find similarly preserved representatives of other ostracode lineages, and of other arthropods, is both high and extremely exciting."

–ERIK STOKSTAD



Family resemblance. Soft tissue of this fossil (top) closely mirrors that of a modern ostracode.

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