

waves is accelerated by high-voltage electrodes to generate the thrust. This technology, which replaces the much heavier solid or liquid fuel used in present propulsion systems, has been used before in stabilizer thrusters but not in the primary spacecraft engine. NASA is planning an ion-thruster demonstration flight in 1998 as part of its New Millennium program. MUSES-C also will rely on a host of new sensors and con-

trols to guide its asteroid landings, and its reentry capsule will require a new type of heat shield to protect it from the much hotter temperatures generated by a higher reentry speed, a result of its trajectory from interplanetary orbit.

In addition to contributing the rover, NASA will also cooperate on the operational aspects of the mission. Although details of the agreement must still be worked out,

NASA expects its contribution to be worth about \$20 million. Next month, NASA Administrator Dan Goldin will meet with ISAS officials at institute headquarters in the Tokyo suburb of Sagami-hara to discuss other ways in which the two countries can pool their resources and technology in space.

—Dennis Normile

With additional reporting by Andrew Lawler.

## FOSSIL TRADE

### For Sale: A Piece of Human History

Paleoanthropologists trolling the Internet last week got an unpleasant surprise: A site called Fossilnet is advertising 20,000-year-old human skulls and even older human jaws for sale online. For \$28,000, buyers can pick up a Cro-Magnon skull, complete with 11 teeth, for their living room; a jaw labeled Neandertal has already sold for \$5700.

Paleontologists are well aware of the brisk trade in fossils, as they watch collectors snap up well-preserved specimens of everything from mollusks to dinosaurs. Indeed, Fossilnet itself is hawking a *Tyrannosaurus rex* for \$10 million (see [www.fossilnet.com/1fossil/findex.htm](http://www.fossilnet.com/1fossil/findex.htm)).

But researchers and dealers alike say that this is one of the most visible instances to date of the sale of such ancient human bones. And even though there is some question about the authenticity of all the bones—and the dealers insist that all transactions have been perfectly legal—paleoanthropologists such as Rick Potts of the Smithsonian Institution in Washington, D.C., call the sale “outrageous.”

Potts says that selling rare human fossils to private collectors represents a loss to science: “Ventures like this can only cause the traffic to increase.” Agrees paleoanthropologist Erik Trinkaus of the University of New Mexico, Albuquerque, “This is scientific material—not works of art to be distributed like Renoirs. It should be in reputable institutions of learning, available to the scientific community.”

For his part, the dealer who runs Fossilnet, Jim Wyatt of Garland, Texas, says, “I would be very happy to see a museum buy this material” but that museums are increasingly finicky about the credentials of the fossils they do buy—and they tend to be short on cash. As for authenticity, Wyatt relies on information supplied by his wholesaler; he identified that dealer only on the condition that *Science* not publish his name. “We take everything on the word of the seller,” he says.

Wyatt, a former magnetic resonance imag-

ing technician and recent entrant into the fossil trade, says he purchased the fossils in February from a European dealer at the world's biggest fossil mart, the Tucson Gem and Mineral Fossil Show in Arizona. That dealer told *Science* that the bones were among those excavated in the 1920s and '30s by an Italian named Frederic Zambelli Hosmer, from caves in the Balzi Rossi (red earth) region in Liguria, Italy, near the French border. Zambelli sold them to finance further research. According to the European dealer, they ended up in the hands of an Italian ar-

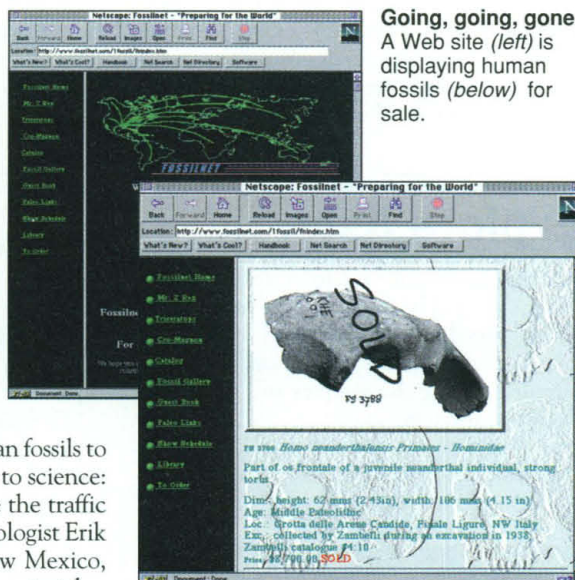
bones found on U.S. public land.

The area of Zambelli's excavations is indeed a well-known fossil region, containing hundreds of limestone caves known for their rich trove of human fossils spanning some 200,000 years, says Neandertal expert Trinkaus. And although it seems that the fossils in question “have very little in the way of reliable geological or archaeological context,” he says that they could be of scientific value if they were “properly excavated and appropriate notes taken.”

But other anthropologists warn that in this case, buyers should be wary. Judging from photos at the Web site, paleoanthropologist Chris Stringer of the Natural History Museum in London says a “Neandertal” frontal bone (see photo), listed as “sold” for \$8700, appears to lack the characteristic double-arched brow ridge of Neandertals; he says a left mandible also looks too modern. Duke University paleoanthropologist Steve Churchill adds that there are discrepancies between the information on Fossilnet and that contained in the *Catalogue of Fossil Hominids*, which lists all known hominid specimens. For example, he says, the Neandertal frontal bone is said to have been excavated from the Arene Candide cave in 1938, but according to the catalog, that cave wasn't discovered until 1940 and doesn't hold anything as old as Neandertal bones. In response, Wyatt cites his wholesaler as a reputable one. Because no one can be sure the bones aren't authentic, Stringer says, “It's very bad that they're being sold this way when they actually may have some important information.”

The European dealer argues that other human fossils from Balzi Rossi remain accessible. The museum in Finale Ligure, a town near the excavations, is already bursting with fossils from Zambelli's digs, he says. Wyatt, who is working on a B.S. in paleontology at the University of Texas, Richardson, stresses that “what we're doing is completely legal. ... If a bus driver decides to buy a piece for \$28,000 and put it on his dashboard, I have no problem with that.” In any case, Wyatt's business is booming: “Later this year, I'm hoping to get some *Australopithecus* material from Ethiopia.”

—Constance Holden



Going, going, gone. A Web site (left) is displaying human fossils (below) for sale.

chaeologist who recently did the same thing, divesting himself of a quarter of a million dollars' worth of fossils in order to finance excavations in Tunisia.

Because Zambelli sold his fossils before strict European laws governing the disposal of excavated material came into effect, both Wyatt and the European dealer maintain that all their transactions are legal. In the United States, paleontological materials are not covered by antiquities laws, which apply only to artifacts, says Smithsonian paleobiologist Bill DiMichele. The only U.S. law governing human remains is the Native American Graves Protection Act, which covers ancient human