

Black Death Diagnosis

Bubonic plague, which first broke out in Europe in 1347, killed some 75 million Europeans before it was brought under control in the early 19th century.

Archaeologists continue to unearth mass graves. Up till now, scientists have looked for the DNA of the plague organism, *Yersinia pestis*, to determine if people died of the plague. But the method is unreliable and in medical testing, it's recently been replaced by a cheaper, faster, and more accurate rapid diagnostic test (RDT) that reveals the presence of a protein specific to *Y. pestis*.

Anthropologist Raffaella Bianucci, working at Turin University in Italy, decided to apply the RDT to the remains of four 17th century nuns and two priests from different parts of France who, records show, took care of the poor and sick. Bianucci confirms in the March issue of the *Journal of Archaeological Science* that all were victims of the Black Death.

"This is very important research," says mummy expert Bob Brier of Long Island University in Brookville, New York. There are conflicting views of how widespread the plague was in Europe. "Now we don't have to rely just on historical sources" to trace its pathways, he says. Bianucci plans to use the test at more sites. Next up will be Lazzaretto Vecchio, the plague infirmary founded on an island in Venice, Italy, in 1403, where 1500 skeletons await their checkup.

Back to the Tap

Bottled water can use up to 2000 times as much energy as tap water, according to a study in *Environmental Research Letters*.

Despite rising concerns about "green" consumption, Americans are drinking 70% more bottled water than they did in 2001, according to Peter Gleick and Heather Cooley of the Pacific Institute in Oakland, California. The pair have added up the energy use in every step of the process. Bottle manufacture alone uses 50 million barrels of oil a year globally, they estimate. Transport is the other big cost. Depending on the distance traveled, U.S. bottled water consumption in 2007 required the equivalent of 32 million to 54 million barrels of oil. In effect, says Gleick, each bottle is 15% to 25% oil.

Hyung-Chul Kim, an industrial ecologist at Columbia University, says the analysis didn't include savings from recycling bottles. Gleick counters that most bottles end up not in new bottles but in carpet, clothing, or toys from China.

Swept Away

Geologist William Dickinson thinks he's worked out when and how coral atolls became habitable abodes for Pacific Islanders. Based on that understanding, he says most may go under during this century.

In the March issue of *GSA Today*, Dickinson, of the University of Arizona, Tucson, explains how swings of sea level formed more than 175 atolls strewn across 9000 kilometers of the tropical Pacific. About 2000 years ago, he says, falling seas allowed waves to build stable islets of sediment on old reefs where 180,000 people now live.

But as global warming drives sea level back up, the process will reverse, notes Dickinson. Once the sea rises higher than the solid atoll foundation, the water "starts to chew into the flanks long before the islets are overtopped," he says. So well before livable areas are flooded, he predicts they'll be washed away "some time between a few decades from now and a century from now." Geologically, "it's a nice story," says geologist Robert Ginsburg of the University of Miami in Florida. Culturally, not so good.

Saliva's Secrets

There's a world in your mouth, and it bears little relation to the world about you.

Mark Stoneking, a molecular anthropologist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, wondered whether mouth bacteria could tell a tale of evolution and human migration analogous to what has

Donating saliva samples in the Philippines.

been revealed by different strains of the stomach bug *Helicobacter pylori*.

Stoneking and colleagues collected saliva from 10 volunteers at each of a dozen locations around the world and sequenced parts of a key bacterial gene in each sample. They found 101 known bacterial genera, 39 of them newly seen in the mouth, and about 64 novel types. Individuals had between six and 30 kinds of mouth bacteria. The big surprise was that there were no geographical patterns in species' presence, despite presumed regional commonalities in diet and environment, the team reported 26 February in *Genome Research*. People in each location shared about 60% of the genera; individuals from different places had about 50% in common.

The study adds to the growing awareness of the personalized world of human-associated microbes, an underappreciated aspect of human health and disease until recently, says Ruth Ley, a microbial ecologist at Cornell University: "These communities are very complex, and the degree to which they vary between people continues to surprise [us]."

