Backtracking a Mummy Virus

People who lived in the Chilean Andes a millennium ago were cursed with the same virus that afflicts many modern Japanese people, a new study suggests. The virus, associated with leukemia and lymphoma, appears to have traveled to the New World with its early settlers, who are believed to have come from northern Asia via the Bering Land Bridge more than 12,000 years ago.

Human T cell lymphotropic virus–type I (HTLV-I), a blood-borne retrovirus, causes leukemia in about 3% of carriers. It's most common in parts of southern Japan, where it infects at least 4% of the population. Isolated groups in Colombia and Chile also harbor HTLV-I, but researchers couldn't be sure whether it had arrived with ancient Americans or later with European colonizers.

Andean harbored Asian virus.

To unravel the virus's origins, Japanese and Chilean researchers led by epidemiologist Kazuo Tajima of the Aichi Cancer Center Research Institute in Kanokoden, Japan, examined 104 mummies buried 1200 to 1500 years ago and preserved by the dry Atacama desert. They were able to get DNA from only two mummies; they found shards of HTLV-I virus in the bones of one. After sequencing the DNA, the researchers report in the December issue of *Nature Genetics*, they found that it closely matched that of HTLV-I virus in modern Japan. Because scientists assume that the virus originated in Asia, the finding not only demonstrates its venerability but adds to evidence that northern Asians peopled South America, says evolutionary geneticist Kenneth Kidd of Yale University: "Our pathogens have been around as long as we have."

Monarch Magnetism

Each fall, millions of monarch butterflies migrate thousands of kilometers south to the same wintering grounds their ancestors left the previous spring. How do they figure out where they're going when the sun's not out? Researchers have found that they, like migratory fish and birds, have a built-in "compass" that enables them to orient to Earth's magnetic fields.

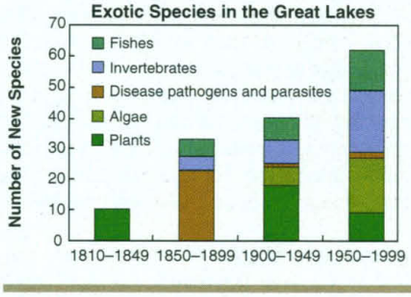
In the winter, monarch butterflies hang out at a dozen sites in the mountains of central Mexico. Come spring, they head up to Texas, where they reproduce and die, leaving their offspring to fan out to points north. A couple of generations later, as winter looms, the butterflies head for Mexico.

Researchers suspected that the critters relied on magnetism for navigation, because a monarch zapped with a brief magnetic pulse will become disoriented. So entomologist Orley Taylor of the University of Kansas, Lawrence, and colleagues captured some southbound monarchs and put them into a 1-meter-diameter column in which the magnetic field could be manipulated. The 40 butterflies that flitted through Earth's standard magnetic field tended to head southwest. When the field was reversed, another group went northeast. And when the field was eliminated, a third contingent flapped around in all directions, the researchers report in the 23 November *Proceedings of the National Academy of Sciences*.

"I'm convinced by the Kansas research that monarchs use magnetic fields to know which way is south," says entomologist Karen Oberhauser of the University of Minnesota, Minneapolis. But how they home in repeatedly on the same tiny wintering grounds is still a mystery.

Ecological Report Card

Waterway-choking foreign species such as the zebra mussel have made big inroads in the Great Lakes in the past 190 years, as seen in this chart from a report by the Heinz Center, a Washington, D.C., think tank. Commissioned by the White House Office of Science and Technology Policy, the report (at www.us-ecosystems.org) assesses what are the most useful yardsticks of ecosystem health. This one focuses on croplands, forests, oceans, and coastal areas. The next roundup, in 2001, will also cover cities and suburbs, arid and rangelands, and more freshwater.



Pickled Animals on Parade

With 68 million plant and animal specimens, London's Natural History Museum boasts one of the greatest zoological collections in the world. The public now gets to see only the most glamorous 1%. Soon, however, most of the other 99% will be brought out of the closet and put in a new Darwin Center now under construction. The aim, says museum director Neil Chalmers, is to "turn the museum inside out."

Specimens collected over the past 300 years will be exhibited for the first time—including millions of jars containing the remains of animals from parasitic worms to alligators, some collected by Pacific explorer James Cook, others by Darwin himself. As part of the $160 million project, the museum's 300-plus scientists will also go on display—through lab tours, talks, and demonstrations. The undertaking also includes $32 million to make databases and other research tools available to anyone over the Internet. The zoology collection will be ready for viewing by summer 2002, with plants and insects to follow later.

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