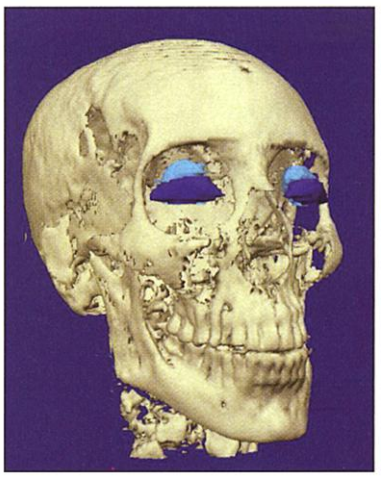
RANDOM SAMPLES

edited by JOSH GEWOLB

Computer Identifies Mummy

During Egypt's 22nd dynasty, Tjenmutengebtiu was a priestess in the Great Temple of Karnak at Thebes. Now Australian scientists have "unwrapped" her mummy and pinpointed her geographical origin, without cracking her body-hugging coffin.

The researchers began by putting "Jeni"—coffin and all—through a conventional medical x-ray computed tomography (CT) scanner, then they analyzed a digital 3D image of her head, neck, and skull.



A computer program correctly identified this ancient skull.

The electronic reconstruction was so good, it's possible to see linen stuffed up Jeni's nose and eye holes by embalmers "to mop up residual fluid" after they removed her brain, says Stephen Hughes, a medical physicist at the Queensland University of Technology in Brisbane, who led the team.

Forensic anthropologist Richard Wright of the University of Sydney was even able to measure Jeni's virtual skull, from nasal breadth to occipital length, as if it were the real thing. "Remarkably, [the 3D model] allowed 27 of my standard 29 measurements," he says.

Wright put the data into CRANID, a computer program he wrote to correlate cranial form and ancestral origin. CRANID compared Jeni's measurements to a database of 2802 skulls from 64 groups of people worldwide. The canny program concluded that the probability was 52.9% that she was an Egyptian Dynasty female.

The successful identification is welcome news to investigators examining bodies encased in coffins or ice, where it is important not to destroy remaining soft tissue or clothing attached to a corpse, says Estelle Lazer, a forensic anthropologist at the University of Sydney. "It's pretty damn amazing. You don't need to deflesh remains to do measurements," she says. "I can see huge potential for such a noninvasive process."

Balzan Prize

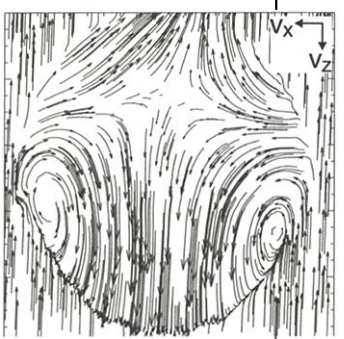
Groundbreaking research in climatology and neuroscience have earned two researchers the Balzan Prize, one of science's richest awards. Worth 1 million Swiss francs (about $600,000), the prizes rotate through different scientific disciplines each year.

The International Balzan Foundation honored climatologist Claude Lorius, director of CNRS, France's basic research agency in Grenoble, for his studies of climate change in recent geological time. His pioneering work on the composition of fossil air bubbles in polar ice was an early indicator of global warming.

Jean-Pierre Changeux of the Pasteur Institute in Paris was recognized for his work as one of the fathers of modern neurobiology. His early research on fish made major contributions to the study of acetylcholine receptors.

The recipients are expected to donate half their award to training young scientists. They will receive their prizes on 9 November in Bern, Switzerland.

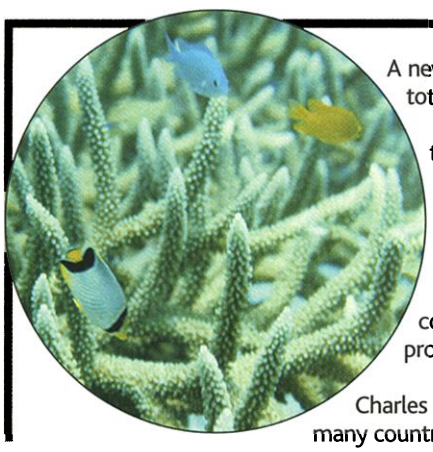
Faucet Physics



The drip, drip, drip of a leaky faucet is enough to drive most people batty, but it doesn't bother physicist Song-I Han. Along with her colleagues at the Institute of Technology of the State of Nordrhein-Westfalen in Aachen, Germany, Han used nuclear magnetic resonance (NMR) to take a snapshot of the vortices within a falling drop of water.

Few scientists thought that NMR was up to the task—including Han herself. Because NMR is slow compared to the rate at which a drop falls, it seemed unlikely that it would be able to take a clear picture. Han thought that the differences between drops would make the image useless. But the snapshots turned out to be invariant, the researchers report in the 1 October *Physical Review Letters*, which allowed them to combine 30,000 into a single composite. The result: an unprecedented image of convection currents that will allow theoreticians to check their models.

"I was just flabbergasted when I saw this," says Eiichi Fukushima, a physicist at New Mexico Resonance, a nonprofit laboratory in Albuquerque. Han hopes that the technique will help scientists understand processes that involve drops of fluid or aerosols—and other drip-related problems that keep them up at night.



Atlas Maps Coral Reefs

A newly published atlas offers the most accurate estimate ever of the world's total coral reef area: 284,300 square kilometers, or about the area of Italy.

To arrive at the new estimate, U.N. Environment Programme scientists combined wildly disparate data, from recent satellite images to maps drawn during the 18th century voyage of Captain Cook. The result is an estimate of global reef area that is substantially smaller than past numbers, in large part because the atlas covers only reefs in less than 30 meters of water. Such shallow reefs are considered to be the most important to marine life and to coastline erosion control.

Most of the 428-page *World Atlas of Coral Reefs* (University of California Press) is a country-by-country accounting of reef area and status. Maps show the distribution of marine protected areas, coral species, coral diseases, and dive centers.

Although such details are useful, the atlas's "value lies more in its global synthesis," says Charles Sheppard, a marine ecologist at the University of Warwick, U.K. For the first time, he notes, many countries will have an accurate accounting of coral reefs in their waters.

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