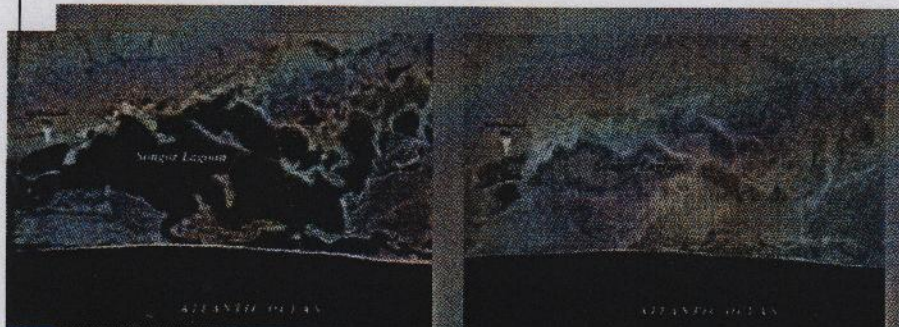


RANDOM SAMPLES

Edited by Constance Holden



The State of Africa's Lakes

The U.N. Environment Programme has assembled a dismayingly picture of the degradation of Africa's 677 lakes. Last week, it introduced a new Atlas of African Lakes at the World Lake Conference in Nairobi, Kenya. Above, satellite images show Lake Songor Lagoon in Ghana, which has lost volume and biodiversity between 1990 (left) and 2000 (right) due in part to salt mining.

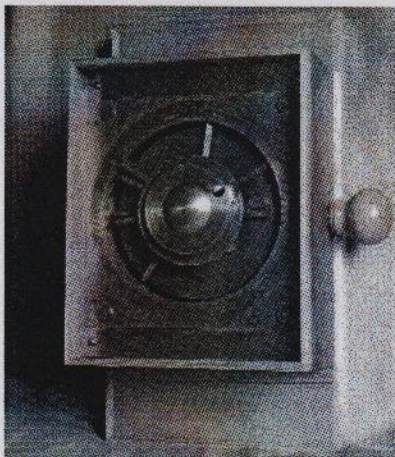
Hellenistic Engineering

Last month in Athens, scientists unveiled a working model of a mysterious instrument discovered a century ago in the ruins of a 2000-year-old Greek shipwreck.

Found as a crusted bronze mass in the cargo of a ship that sank off the island of Antikythera, the instrument, dubbed the "Antikythera Mechanism," was a jumble of gears and dials encased in a wooden box.

Yale University science historian Derek de Solla Price puzzled for many years over the instrument. After x-raying it, he concluded in 1974 that it was designed to compute solar and lunar cycles. He described some 30 bronze gears that required a differential turntable to coordinate them—which would have been a revolutionary technology for the time.

In 1989, engineer Michael Wright, now at Imperial College London, and Sydney University computer scientist Allan Bromley applied more advanced imaging technology to determine the level of each wheel and



Mystery planetarium reconstructed.

gear within the mass. They showed that Price's inclusion of a differential gear was incorrect. Bromley's death interrupted the work, but in 2002, Wright started again on a reconstruction.

His complete working model, unveiled at the Second Conference on Ancient Greek Technology in Athens, demonstrates that the mechanism included a complete planetarium, showing the orbits, or epicycles as the Greeks called them, of not only the sun and moon but also the five planets known to the Greeks: Venus, Mars, Jupiter, Saturn, and Mercury. The instrument shows that intricate geared mechanisms were "an accepted element of Hellenistic technology," says Wright.

Latest in Translation

Grad student Stan Jou was mouthing Mandarin Chinese, but no sounds issued from his mouth. Instead, a robotic voice from a speaker spoke for him, using inputs from electrodes glued to his cheeks and throat. The words, in English or Spanish, were part of a press conference last week at which computer scientist Alex Waibel of Carnegie Mellon University in Pittsburgh, Pennsylvania, and others showed off their latest toys for speech recognition and translation.

The electrodes on Jou's face picked up movements of his face and throat muscles. Software turned them into words, which were then translated. So far, the system can only recognize about 15 phrases. But Waibel predicts that someday people will be able to have face-to-face conversations in alien tongues without the sounds of their original words getting in the way.

The researchers are also developing goggles displaying simultaneous translations of a talk. And they've built directed speakers that can pinpoint a person in a crowd and deliver a translation as if it were being whispered in the ear. Waibel's software for translating spoken language is some of the best in the world, says Satoshi Nakamura of the Advanced Telecommunications Research Institute in Japan, but he doubts such a program will make it to the marketplace in this decade.

Some of this technology could require more-or-less permanent attachments to the listener. But, says Waibel, "I think someday people will accept having a few electrodes implanted in their cheek."



Who's No. 1?

Britain's Royal Society launched two polls this week—an online one for the public and one for scientists—on whether Einstein or Newton is "the greatest scientific heavyweight of all time." Results will be announced at an "Einstein vs. Newton debate" in London on 23 November.

According to Royal Society vice president Martin Taylor, the society is hoping the contest will inspire British students, whose interest in physics has "reached a historical low." Vote at www.royalsoc.ac.uk.

CREDITS (TOP TO BOTTOM): U.N. ENVIRONMENT PROGRAMME; ALEX WAIBEL; MICHAEL WRIGHT