

## CLIMATE CHANGE

# Chinese Cave Speaks of a Fickle Sun Bringing Down Ancient Dynasties

A 1.2-meter-long chunk of stalagmite from a cave in northern China recorded the waning of Asian monsoon rains that helped bring down the Tang dynasty in 907 C.E., researchers report on page 940. A possible culprit, they conclude: a temporary weakening of the sun, which also seems to have contributed to the collapse of Maya civilization in Mesoamerica and the advance of glaciers in the Alps. “I think it’s one of the coolest papers I’ve seen in a long time,” says paleoclimatologist Gerald Haug of the Swiss Federal Institute of Technology in Zurich. This latest cave record also points to the potentially devastating effects that climate change—even change that’s mild when averaged around the globe—can have on vulnerable local populations.

Although hardly the final word in such controversial fields, the cave record—which other researchers describe as “amazing,” “fabulous,” and “phenomenal”—provides the strongest evidence yet for a link among sun, climate, and culture. The key to obtaining this was “a really, really clean sample,” says paleoclimatologist Lawrence Edwards of the University of Minnesota (UM), Twin Cities. Paleoclimatologists Pingzhong Zhang of Lanzhou University in China, Hai Cheng of UM, Edwards, and colleagues collected a stalagmite (a mound composed mostly of calcium carbonate slowly precipitated from dripping groundwater) from Wanxiang Cave in northern China at the far reach of the rains of the summer Asian monsoon.

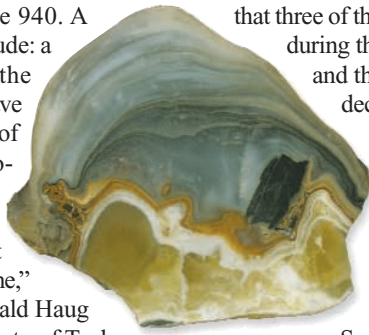
Relatively high amounts of uranium and exceptionally low clay-borne thorium in this stalagmite enabled them to conduct uranium-thorium radiometric dating of the layered deposits to within an average of just 2.5 years. As a result, they could calculate precise dates for subtle variations in the stalagmite’s oxygen isotope composition that reflect variations in rainfall near the cave. “They absolutely nailed the rainfall history

of [northern] China over the past 1800 years,” says Haug.

Comparing their rain record with Chinese historical records, Zhang and colleagues found that three of the five multicentury dynasties during that time—the Tang, the Yuan, and the Ming—ended after several decades of abruptly weaker and drier summer monsoons, possibly poor rice harvests, and social turmoil. In turn, decades that included the strongest, wettest monsoon of the past millennium coincided with the Northern Song Dynasty’s golden age of rich harvests, exploding population, and social stability. “Our results really match the historical record,” says Edwards. “You can’t figure it’s all climate, but when you see these nice correlations, you see that climate probably played an important role.”

The group then looked farther afield. Critical parts of their monsoon rainfall record—in particular the dryness of the late Tang dynasty—match neatly with a previously published climate record from a lake on the southern coast of China, with the advances and retreats of Swiss alpine glaciers, and with records from within and near Central America. Most striking is the correlation between the Asian monsoon and the collapse at the end of the Maya Classic period under severe drought duress around 900 C.E. (*Science*, 18 May 2001, p. 1293), near the end of the drought-stricken Tang dynasty.

Previous research had linked changes in ▶



**Good times.** Monsoon rains were plentiful early in the Northern Song Dynasty of China, according to the isotopic record in a cave stalagmite (top). A cave-wall painting from the same province (above) recorded the bounty.

## Call to Resume Nutrition Program

**PARIS**—After months of quiet diplomacy, Médecins Sans Frontières (MSF) has issued a public call to President Tandja Mamadou of Niger to let the humanitarian organization resume its nutrition programs in the country. The suspension by the Nigerien government “endangers the lives of thousands of children,” MSF said in a statement last week. The French section of MSF operated a massive program in Niger’s central region of Maradi, where malnourished children were given new, peanut-based products said to have revolutionized malnutrition treatment (*Science*, 3 October, p. 36). But the Nigerien government ended the program in mid-July, accusing MSF of breaking rules for nongovernmental organizations and insufficient coordination with the national health care system. Negotiations have been fruitless.

The suspension has also interrupted research into the efficacy of the peanut pastes and a large-scale study of infectious diseases in malnourished children for which subjects were recruited from an MSF hospital. Scientists are hoping they can resume the latter study by recruiting patients from a local hospital instead, says MSF’s Philippe Guérin.

—MARTIN ENSERINK

## Stalking Killers in Africa

**BEIJING**—Virus hunters in West Africa are banding together to better cope with emerging threats and old foes. At the International Consortium on Anti-Virals (ICAV) meeting here this week, researchers from Nigeria, Ghana, and other countries in the region agreed to establish a West African Viral Surveillance Network. “This is a neglected area of the world,” says ICAV co-founder Jeremy Carver, a molecular biologist and professor emeritus at the University of Toronto in Canada.

Organizers have not decided on goals for fundraising, which has just begun, so the focus for now is on forging connections. “Scientists in the region weren’t talking with each other,” says ICAV Africa director Oyekanmi Nashiru of the National Biotechnology Development Agency in Abuja, Nigeria. There is plenty to share. Nigeria has virology expertise but poor infrastructure, Nashiru says, whereas nearby Ghana has top-notch labs at the Noguchi Memorial Institute for Medical Research at the University of Ghana in Legon. Key quarry include bird flu, HIV, and polio, which has yet to be eradicated from West Africa. When it comes to emerging viruses, says Noguchi Institute molecular biologist James Brandful, “now we’ll be better prepared.”

—RICHARD STONE

## PERSONAL GENOMICS

# The Touchy Subject of 'Race'

Nothing makes scientists more nervous than the topic of "race," so much so that they'd like to find a way not to talk about it at all. That was the core issue last week at a meeting\* at the National Human Genome Research Institute (NHGRI) in Rockville, Maryland, where about 40 scientists and ethicists debated how to present the torrent of new findings from human gene sequencing studies to the public.

In different parts of the world, different gene mutations become advantageous and spread quickly through a population, making some variants more prevalent in particular ancestral groups. Some are innocuous enough—such as the emergence of lactose tolerance in farming populations. But there's already much debate over the use in medicine of findings of racial differences in the prevalence of genes associated with certain diseases. Many scientists predict that it won't be long before they have solid leads on much more controversial genes: genes that influence behavior—possibly including intelligence.

Everyone at the meeting agreed on the need for non-"fraught" terminology—"geographic ancestry," for example, instead of "race." But specifying such ancestries is also a minefield. "Amerindian," for example, is offensive to Native Americans, according to one speaker. "Caucasian" is also unacceptable because it implies racial rather than geographic ancestry. Some speakers even advised that it is inappropriate to refer to a "European allele" for lactose tolerance, because it also occurs in other groups.

Participants acknowledged that however they characterize their findings, they can't control what the public makes of them. "When translated into popular culture, society reads whatever term we pick as 'race,'" said Timothy Caulfield, a health law professor at the University of Alberta in Edmonton, Canada. Carlos Bustamante, a population geneticist at Cornell University, said that when his group published a study in *Nature* this year indicating that European-Americans had more deleterious gene mutations than African-Americans, some publications touted the report as suggesting that blacks are fitter than whites.

Some tense moments came during a discussion of a paper on brain genes. In 2005, geneticist Bruce Lahn and colleagues at the



**Ancestry, not race.** Researchers are grappling with how to communicate genetic data on differences among populations.

University of Chicago in Illinois reported evidence for selection in mutations of two genes regulating brain development that are more common in Eurasians than in Africans (*Science*, 9 September 2005, pp. 1717 and 1720). They hypothesized that these mutations were related to the human cultural explosion some 40,000 years ago (*Science*, 22 December 2006, p. 1871). Celeste Condit, a professor of speech communication at the University of Georgia, Athens, criticized the way the papers were written, saying they could be seen as having a "political message embedded" in them: that the genes might contribute to racial differences in brain size and therefore perhaps to racial differences in IQ. Lahn denied any political message, telling her she was "putting words in [my] mouth."

Later, Lahn commented that some scientists "are almost like creationists" in their unwillingness to acknowledge that the brain is not exempt from selection pressures.

At the end of the day, Allen Buchanan, a philosophy professor at Duke University in Durham, North Carolina, warned the group against going overboard. "A visible, concerted effort to change vocabulary for moral reasons is likely to trigger a backlash," he said. There's "risk of ... stifling freedom of expression in the name of political correctness," he said, and losing credibility in the process.

—CONSTANCE HOLDEN

## A Graduate Appetizer

The National Academies' eagerly awaited assessment of U.S. doctoral programs won't be released for another few months. But for the university administrators, faculty members, and graduate students whose lives are influenced by this mammoth undertaking, a description of what's new since the 1995 edition should be available in a few weeks. One wrinkle will be multiple ratings: In addition to a score from peers on overall quality, each of the 5000-plus programs at 212 universities will be ranked according to dimensions such as faculty productivity, diversity, and student outcomes. "They include factors the schools can influence and those that they can't really control," says study director Charlotte Kuh of the National Research Council.

—JEFFREY MERVIS

## Backing Up Hubble

The good news for NASA's Hubble Space Telescope is that controllers last week finally got a balky backup system to take over the job of sending images to Earth after the main system malfunctioned. The bad news is that managers have tacked on several months to the scheduled launch of a mission intended, among other things, to replace the faulty data system and avoid dependence on the backup. In a 31 October press conference, NASA officials said that preparing a replacement data system for launch and installation by astronauts will delay the repair mission, Hubble's last upgrade, until at least May 2009.

—ANDREW LAWLER

## A Basic Change for Korea

South Korea's academic researchers are smiling in anticipation of next year's budget. The Ministry of Education, Science, and Technology is seeking a 9.5% rise in its 2009 budget to \$3.2 billion. "Korea has concentrated on applied science until now, but governmental policy is changing to increase support for basic research" to produce fundamental breakthroughs for technological development, explains Hang Sik Park, director of the ministry's Science and Technology Policy Planning Bureau. He says the proportion of governmental funding going to fundamental research could rise to roughly 28% of the total, up from about 25.6% this year. Other areas in line for big funding boosts include international collaborations, rising 75% to \$34 million, and green technologies, with a 92% increase to \$53 million. Other ministries have not yet announced their R&D requests, but the budget will go before the national assembly in December.

—DENNIS NORMILE

\*Workshop on Ethical, Legal, and Social Issues in Natural Selection Research.