species on life support. That means more thinking will be needed about how to prioritize funds spent on endangered species.

–ERIK STOKSTAD

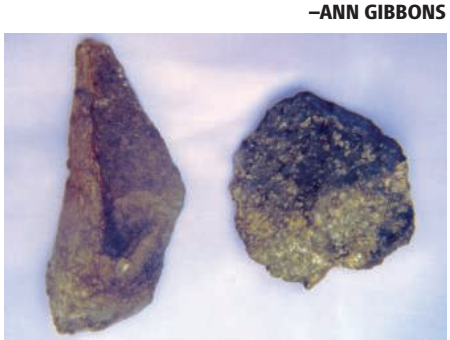
First Globetrotters Had Primitive Toolkits

Ever since researchers found fossils of *Homo erectus* beneath a medieval castle in Dmanisi, Georgia, they have been chipping away at the image of this venerable human ancestor. At 1.8 million years old, the fossils are the earliest members of the human family known outside Africa. Now, it turns out that they managed to trek all the way across Africa and the Middle East with the most primitive kind of stone tools known rather than with more sophisticated stone hand axes that were thought to be essential for intercontinental travel.

The textbook vision of the first world traveler has changed, says paleoanthropologist David Lordkipanidze of the Georgian National Museum in Tbilisi. This is the third time Lordkipanidze's team has revised the textbook view of early *H. erectus*, suggesting that it was more primitive than expected. First, his group published the brain size of the fossils at Dmanisi, which had a volume of just 650 cubic centimeters—not much larger than an australopithecine's brain volume of 450 cc. Then, the team found leg bones and announced that the Dmanisi people were short. Now, they have found Oldowan, Mode 1 stone tools at Dmanisi (see picture), not the retouched Acheulean hand axes that were a kind of Swiss Army knife for *H. erectus* in Africa.

"I'm not at all surprised," says paleoanthropologist Robert Blumenschine of Rutgers University in New Brunswick, New Jersey. He says it's not uncommon to find evidence of both types of technologies in the same fossil locality. "The Oldowan tools were still good tools—they used them for different things," says Blumenschine. There was no such thing as technological obsolescence—yet.

–ANN GIBBONS



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ECOLOGY

Tree Rings Tell of Angkor's Dying Days

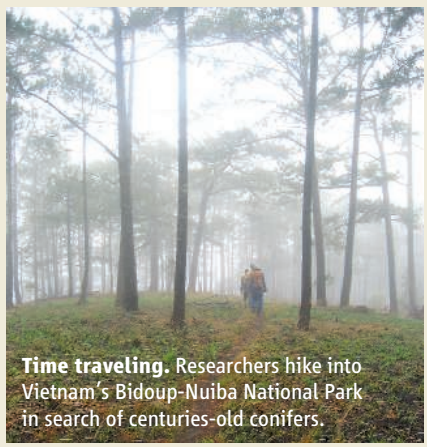
Archaeologists have long puzzled over the collapse of the mighty medieval Khmer kingdom in Southeast Asia best known for its resplendent capital, Angkor. New findings suggest that a decades-long drought at about the time the kingdom began fading away in the 14th century may have been a major culprit.

Evidence for a megadrought comes from centuries-old conifers that survived the Angkor era. At a conference* earlier this week in Dalat, Vietnam, tree-ring scientist Brendan Buckley of Columbia University's Lamont-Doherty Earth Observatory in Palisades, New York, described how the annual growth rings of conifers in Vietnam reveal a sharp weakening of Asia's summer monsoon from 1362 to 1392 C.E. and again from 1415 to 1440 C.E., just as the Little Ice Age was setting in and right when the Khmer kingdom was reeling. The tree-ring chronologies "represent a major breakthrough in tropical dendrochronology," says David Stahle, a tree-ring expert at the University of Arkansas in Fayetteville.

Finding this new trove of data wasn't easy. Many tree species in Southeast Asia lack growth rings or have ones that cannot be used to reveal annual patterns, says Buckley. But in the past 5 years, he and others have validated several species in the region with annual growth rings. The evidence presented in Dalat comes from a rare conifer, the po mu (*Fokienia hodginsii*), spanning 7 centuries.

Its drought-revealing tree rings corroborate similar climate data from coral reefs and, most recently, stalagmites and stalactites that peg monsoon changes to the fall of other Asian societies (*Science*, 7 November 2008, p. 837). "The evidence for pronounced weakening of the monsoon is indisputable," says Daniel Penny, co-director of the Greater Angkor Project (GAP) at the University of Sydney in Australia.

The Khmer kingdom, which encompassed much of modern-day Cambodia, central Thailand, and southern Vietnam, would not be the first civilization to literally bite the dust. A series of droughts devastated the Maya city-states of the Yucatán Peninsula between 800 and 900 C.E., around the time Angkor was rising. It's still unclear whether prolonged drought several centuries later brought a vibrant Khmer kingdom to its knees or was a coup de grâce to a staggering society. Nevertheless, the medieval tree rings may offer a lesson for the modern world: Harsh weather events, predicted to grow more frequent with global warming, may imperil communities on the knife edge of sustainability.



Time traveling. Researchers hike into Vietnam's Bidoup-Nuiba National Park in search of centuries-old conifers.

Angkor's rulers, on the backs of a huge corvée labor force, built hundreds of temple complexes—including Angkor Wat, humanity's largest religious monument—and carved hundreds of kilometers of canals and massive reservoirs that appear to have been used both for irrigation and for religious ceremonies. Then, in one of archaeology's enduring mysteries, Angkor was largely abandoned by the 16th century.

Theories abound for how the wealthy kingdom fell, with one of the latest ideas being that Angkor's vaunted waterworks grew too complex to maintain (*Science*, 10 March 2006, p. 1364). Recent archaeological and pollen findings from GAP indicate that Angkor's great reservoirs and storage ponds began operating at sharply reduced capacity several decades before the back-to-back droughts. That evidence suggests Angkor was in trouble long before drought set in, says GAP co-director and Sydney archaeologist Roland Fletcher. "Climate instability would have been a severe problem for a massive and inflexible water network to manage," he says.

"I'm very concerned that the story will end with, there was a drought and Angkor collapsed," adds Penny. "It's not as simple as that—and [it's] far more interesting."

–RICHARD STONE

*Climate Variability in the Great Mekong River Basin, 16–18 February.

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