PALEOANTHROPOLOGY

Rocking the Cradle of Humanity

The nation of Ethiopia is seeking to leverage its past—including its most famous daughter, the hominid called Lucy—to help secure its future

ADDIS ABABA, ETHIOPIA—At the National Museum here, Stephanie Melillo sits within arm's reach of almost 5 million years of human evolution—literally. Crammed into a corner in a temporary lab, transferring notes penned in a battered yellow notebook to her computer, this Stanford University graduate student must move out of the way so researcher Timothy White can unlock the filing cabinet that houses the reconstructed teeth of the famed 4.4-million-year-old hominid, *Ardipithecus ramidus*. A second cabinet nearby contains the cranium called Herto, which at 160,000 years old is one of the oldest known modern humans, plus skulls of *Homo erectus* and *Homo rhodesiensis*, 1 million and 500,000 years old, respectively.

White, of the University of California, Berkeley, co-leader of a team that discovered many of these fossils, eagerly explains the bones' significance to visiting government officials while Melillo and other researchers from three continents jostle elbow to elbow, desperately trying to finish their work before their visit here ends. It's clear that the group needs more space and that these priceless fossils need a better home. "We're coiled up here like a spring ready to explode," White complains.

In a few months, however, White and other researchers should each have their own office during their stays in Ethiopia, while the hominids rest in cushioned vaults. Even as Melillo works and White talks, hammering and other construction noises outside their windows herald the impending opening of the museum's new research center. Built with $10 million from the Ethiopian treasury, it is symbolic of a burst of scientific enterprise from a country besieged with AIDS, periodic famine, and, occasionally, armed conflict.

Kenya once held the world's attention for its contributions to understanding human evolution. But Ethiopia has its own cache of ancient treasures, and its leaders hope to use them to advance both the country's image and the science within its borders. "We want to catch up with the rest of the world," says Mohammoud Dirrir, minister of culture and tourism.

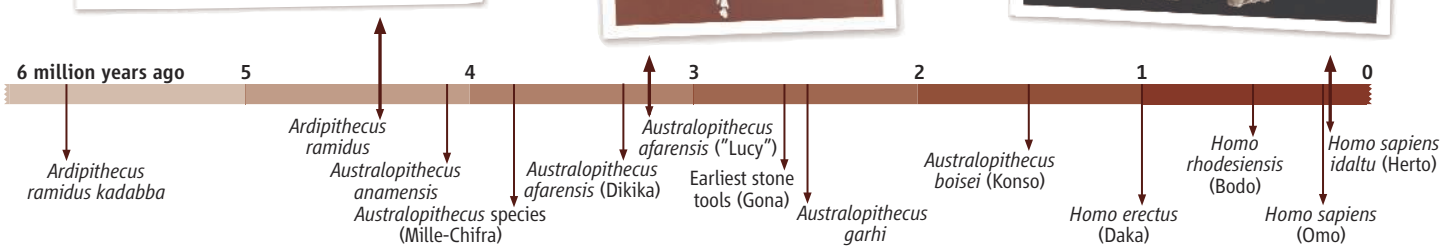
Not just the national museum but also universities and outreach efforts are expanding, in hopes of building Ethiopia's internal scientific capacity, encouraging research, and developing tourism. As part of its millennium celebration (Ethiopia follows the Egyptian Coptic calendar, in which this is the year 2000), the government hosted an international meeting* last month to foster links between research and development. For researchers, "everything is more positive, welcoming," says paleoanthropologist and native Ethiopian Sileshi Semaw of Indiana University, Bloomington. "Everyone is realizing our work is important."

Many obstacles exist. Ethiopia still lacks the funds and skilled teachers needed to realize its vision of being a scientific leader in Africa. And tourism and outreach sometimes conflict with research. Despite protests from scientists, the Lucy skeleton is now on tour in the United States. But there is optimism as well. The government and scientists "are now working together very well," says White. "We need to build on this collaboration as we move forward together."

Move to modernize

Working in Ethiopia hasn't always been so amicable. When Emperor Haile Selassie was overthrown in the 1970s, researchers were kicked out and the search for fossils suspended for several years. Even after White and others were allowed back in, the government paid little mind to their discoveries. But today, Lucy's discoverer, Donald Johanson of Arizona State University in Tempe, calls Ethiopia "Africa's most promising country to expanding our knowledge of the past." His project in Hadar in the Afar region of eastern Ethiopia is one of about 25 active paleontological or archaeological field sites in the country (see map, p. 1183). All fossils and artifacts unearthed stay in the country; once researchers leave the

* "International Conference on Transforming the Might of a Century-Long Research Output into Development," 12–15 January, Addis Ababa, Ethiopia.



Step by step. Ethiopia is home to fossils representing many stages of hominid evolution from *Ardipithecus* to *Homo sapiens*.

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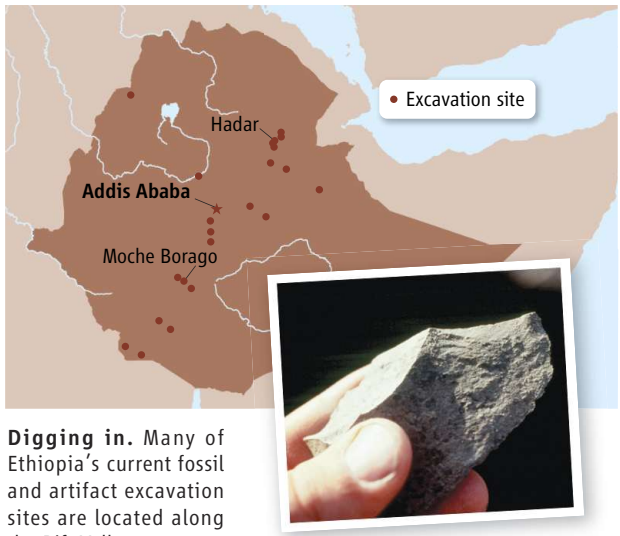
field, they must go directly to the museum to drop off their finds, even if it means a late-night rendezvous with caretakers.

So it is no surprise that the museum is bursting. For decades, researchers squeezed into the former governor's residence; a small lab building was added in 1982 with funds from the U.S. National Science Foundation. But space remained tight. Some decades-old specimens are still wrapped in the newspaper or even the dried grass they were delivered in, waiting to be processed. "If two or three teams showed up at the same time, it was very hard to work," Johanson recalls.

Then in 2003, that lab was razed to make way for a six-story, modern structure that includes a two-floor library, a 500-person auditorium, and 200 rent-free offices, plus storage and study space for more than a million specimens. The three wings are devoted to paleontology and archaeology; art and history; and administrative, conservation, and educational spaces.

Although scheduled to open in the next few months, the building is still a dusty shell of concrete and glass, with unfinished wiring poking out of walls, ceilings missing tiles, and a gaping hole on the ground floor where a giant elevator is to go. The museum needs more than $5 million to outfit the new facility—there are almost no books for the library, for example—and less than $200,000 has been raised so far.

Foreign aid is helping: France is supplying furniture, and Japan may outfit the hominid spaces. Everyone involved is thrilled and not just with the prospect of more space. "It shows how much emphasis has been given [to research]," says Ethiopian native and paleoanthropologist Yohannes Haile-Selassie of the Cleveland Museum of Natural History in Ohio. "In a country that has a lot of needs, the government could have easily used that money for something else."



Digging in. Many of Ethiopia's current fossil and artifact excavation sites are located along the Rift Valley.

Beyond concrete and glass

But a six-story building that serves primarily as a second home to researchers from abroad is just the first step. "We must train more Ethiopians," says Berhane Asfaw, an Addis Ababa–based paleoanthropologist who often works with foreign teams. Toward that end, the Ethiopian government has about tripled the number of universities in the past 3 years and promised $10 million toward educating 10,000 master's students and 2000 Ph.D.s in the next 5 years. Addis Ababa University will shift its focus from undergraduate to graduate education.

Natural as well as applied sciences will get a boost, with new graduate programs sprouting up, including interdisciplinary ones key to fields such as paleontology. In the works are a botanical garden and a new natural history museum to promote research that is focused more on biology and earth sciences than is the national museum. And the goal for the next generation—unlike that of Haile-Selassie, Berhane Asfaw, and about a dozen other prominent Ethiopian researchers, all educated abroad (*Science*, 29 August 2003, p. 1178)—is to have "most of the training done in-house," says Araya Asfaw, dean of science at Addis Ababa University. The hope is to foster permanent research programs within Ethiopia that depend less on foreigners.

At the same time, "one of the most important things that needs to happen is the integration of tourism and science," says White. And that, too, is happening. National Geographic has pledged support for an educational center at the village nearest to Hadar, home of the 3.2-million-year-old Lucy. With better roads under construction, "it could easily be a destination spot for tourists," Johanson predicts. Exhibit plans are still taking shape, but there likely will be casts of Lucy and other fossil hominids, as well as photographs from the site.

Steven Brandt of the University of Florida, Gainesville, has similar visions for Moche Borago, an excavated cave an 8-hour drive southwest of Addis Ababa. Here, Brandt's team has dug up stone tools and other artifacts that help reveal the transition to complex societies about 50,000 years ago. Brandt hopes to set up a small research center at a local university, and he talks enthusiastically about the cave's potential as a stop-off, complete with displays and craft shops, for tourists heading to see native tribes farther south. "If he is committed [to that project]," says Yonas Beyene, research director at Ethiopia's Authority for Research and Conservation of Cultural Heritage, "it would be very much appreciated."

Researchers hope also to build another museum in or close to Addis Ababa devoted to human evolution, with an expected €10 million from the European Union, says Berhane Asfaw. The new museum will boost public outreach about hominids in a way the National Museum, with its limited exhibit space, cannot, he adds.

Are these goals a pipe dream? Maybe. Ethiopia faces an acute shortage of professors to teach graduate courses and at the moment can support little research by local scientists. "They have no money," says geologist Maurice Taieb of the Centre Européen de Recherche et d'Enseignement des Géosciences de l'Environnement in Aix-en-Provence, France.

Already, the government's decision to send Lucy abroad has raised the ire of some. Many Ethiopian and Western scientists argued that the skeleton was too fragile to travel (*Science*, 27 October 2006, p. 574). "Obviously, the Ethiopian government has made its own decisions on how to use Lucy in terms of tourism and economic gains," says Haile-Selassie, as the priceless bones are now on display in Houston, Texas. Lucy is scheduled to stay in the United States for several years, although no additional exhibitions are yet confirmed. Money earned by Lucy's travels will help improve the National Museum, says museum director Mamitu Yilma.

And even if, as Ethiopian officials hope, Lucy sparks a run of tourists visiting Ethiopia, Brandt worries about the fate of sites those tourists might want to see. Many sites are already vulnerable, he says, and better roads may destroy them or make them too accessible. "By opening up [to tourism], we can lose everything we have," agrees Berhane Asfaw.

Yet Seyoum Bereded, director of the Ethiopian Millennium National Festival Council Secretariat, is unfazed by these challenges, saying that science and tourism can be a compatible, and profitable, match. He's ready to push Ethiopian science into the 21st century. "If we have peace, we can do anything."

–ELIZABETH PENNISI

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