

for 70 million years.

With the government setting the priorities, some scientists were bound to feel left out in the cold. According to medical biochemist Wieland Gevers, the government



Responding to the challenges. NRF president Khotso Mokhele.

has turned a deaf ear to his funding requests for the Institute of Infectious Disease and Molecular Medicine, a new biomedical research facility that he founded on the University of Cape Town campus in 2001. So far, its funding has come from grants that its 25 staff scientists brought with them or from private donations. “It’s a paradox,” Gevers says. “We’re in a country with more than 5 million people infected with HIV, the highest rate of tuberculosis, and malaria on its borders, yet we can’t get support for a major new institute for infectious diseases.” Instead, he complains, funding is lavished on projects with little relevance to the country’s immediate needs: “It’s money going into the stars.”

Adam disputes that characterization. He notes that the leveraging strategy used to land big astronomy projects in South Africa has also won international collaboration in health research. “In the past couple of years, we pumped a lot of cash into the whole bio area,” he says. “If you look at the growth area, it’s not astronomy, it’s biotech.”

Mokhele notes that in 2001 NRF launched a strategy for responding to South Africa’s development challenges. With broad titles such as “Unlocking the future: Advancing and strengthening strategic knowledge” and “Sustainable livelihoods: The eradication of poverty,” the categories are intended to draw in scientists from a range of disciplines. “Instead of saying, ‘This is chemistry, physics, sociology, or psychology,’ we’re saying, ‘Here are the challenges that we’re responding to. How does your scholarship and research respond to them?’” Mokhele explains.

Many South African researchers insist that they are eager to pick up that gauntlet. “Fairly ordinary scientists can actually make a huge difference in whether things succeed or fail here,” says astronomer Patricia Whitelock of the South African Astronomical Observatory. And in stark contrast to how things were a mere decade ago, black researchers will have just as large a role as their white peers in keeping the scientific community—and the country—afloat.

—CHARLENE CRABB

Charlene Crabb is a science writer based in Paris.

New South Africa Puts Emphasis On Reclaiming Humanity’s Past

Some of the world’s most famous archaeological sites are to be found in South Africa, but so far few blacks have entered the field

ELANDS BAY, SOUTH AFRICA—It might not look like prime real estate, but this rocky outcrop studded with prickly fynbos bushes and boulders has been a penthouse of sorts since the dawn of humanity. From the cool shade of a rock shelter in the sandstone face, the earliest known *Homo sapiens* could enjoy an unobstructed view of the Verlorenvlei River valley and the moving feast—a dozen varieties of antelope—that grazed on the grassy banks.

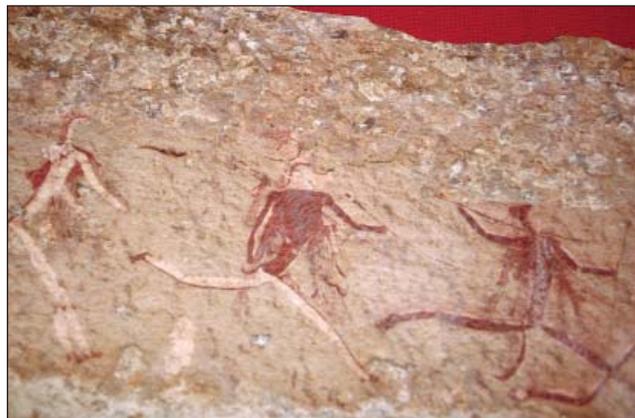
Archaeologists have unearthed a treasure-trove of artifacts under the packed dirt of the shelter’s floor. Among the finds are the remains of a cooking hearth, a trash pile that consists mostly of seafood shells, and fragments of ostrich eggshell etched with geometric patterns, which some claim are the oldest examples of symbolic expression ever found. The deepest layer being uncovered is estimated to be almost 100,000 years old. Closer to the present surface, the accumulated dirt has

yielded stone tools of increasing sophistication. And painted on the walls with red ochre possibly as many as 20,000 years ago are graceful images of antelopes next to human handprints. Under this sheltering stone ceiling is “the oldest record of human cultural evolution in the world,” says Cedric Popenpoel, an archaeologist at the University of Cape Town (UCT), who is directing the excavation.

And this is only one of a plethora of sites in South Africa that reveal not only the origins of human culture but also the evolutionary transition from ape to human. Some 1200 kilometers to the northeast, the Sterkfontein cave near Johannesburg has offered up one of the richest sources of early hominid remains in the world, with over 600 specimens so far including the famous “Little Foot,” a 3-million- to 4-million-year-old skeleton of an australopithecine, our recent apelike ancestor. “Sterkfontein is unusually good for pro-

ducing whole skeletons,” says Phillip Tobias, a paleoanthropologist at the University of the Witwatersrand in Johannesburg, probably because our unfortunate ancestors either fell or climbed down into the cave and couldn’t get back out again. As a result, he says, researchers have the unique opportunity to study a “diversity of specimens cheek by jowl.”

From Verlorenvlei to Sterkfontein and hundreds of sites in between, South Africa has become “probably the best place in the



Homegrown talent. South Africa has abundant rock art, now used in the national crest.

world to study where we came from,” says John Parkington, a prehistoric archaeologist at UCT. “It is certainly one of the cradles of humanity” where many of the key fossils for the modern theory of human ancestry have been unearthed. Hoping to build on its natural endowment of Paleolithic riches, the South African government has designated human origins research as one of its priorities for basic research funding, although so far it has limited support mostly to the handful of well-known sites. But some experts see an equally important task in transforming the demographics of their white-dominated research community.

Bringing South Africa’s ancient wonders to light didn’t always receive such encouragement. During the apartheid era, “I received absolutely no financial support from the government” for excavations, says Tobias. Strongly influenced by the conservative Dutch Reform Church, the apartheid government was loath to fund research on evolution

“that contradicted the Bible,” he says. Moreover, Tobias and other researchers were often cut off from their colleagues overseas by the antiapartheid movement’s academic boycott. This made it “often impossible to attend conferences or to publish in many journals.”

Perhaps no one has a better perspective on how things have changed here than Poppenpoel. In 1962, at the age of 17, Poppenpoel entered the field of archaeology at the only level allowed to blacks under apartheid: as a laborer. He was hired by Barbara Anthony, an archaeologist now retired from Harvard University. As they excavated a remote Stone Age site in the Western Cape province, “she continuously fed me with information and books,” Poppenpoel recalls, and within a year he “fell in love with archaeology.” After the dig, Anthony brought Poppenpoel to the South African Museum in Cape Town, where he helped her sort and analyze artifacts. One day at the museum he was approached by Raymond Inskeep, a renowned UCT archaeologist, who later moved to the University of Oxford, U.K. “He asked me if I’d like to go to the University of Cape Town to study archaeology.”

Poppenpoel was thrilled but anxious: “There had never been a single black archaeology student there.” To get around the apartheid ban on him studying there, Inskeep arranged for the archaeology department to employ Poppenpoel as a staff member, providing a loophole for him to attend classes. He completed the undergraduate course of study, “although of course I was never given the degree.” Everything changed 10 years ago with the arrival of democracy. With all barriers dropping away, Poppenpoel dove into a master’s thesis and is now in the home stretch of a Ph.D. It will be an extraordinary thesis: As the principal investigator at the Verlorenvlei site, he is in charge of one of the most important early human sites in the world.

Poppenpoel’s success story is all too rare here. The ranks of paleoanthropologists and archaeologists in South Africa remain almost entirely white. “Very little has changed since the end of apartheid,” laments Parkington. Part of the problem could be a lingering taint of colonialism. “Archaeology and anthropology were born in colonial circumstances” when white foreigners arrived, grabbed material, and “left nothing behind,” Parkington says. If this work is never taken on by black researchers, he adds, “it would be a great shame.”

One serious barrier to black students, most of whom are from financially struggling families, is the lack of job prospects. Because the study of prehistory “never became part of the public consciousness,” says Parkington, “the whole field has been in de-

cline,” with the number of museum and university positions “shrinking since the 1980s.” Over the past decade, the need for new student scholarships and faculty positions “has not been met.” Tobias agrees but predicts that prospects could soon improve. “There hasn’t been a flood of black students yet,” he says, but the numbers are improving, at least at the undergraduate level.

This is one area where the rest of Africa is coming to South Africa’s rescue. Tobias notes that black paleoanthropologists from the rest of Africa are coming here as visiting faculty members, providing black students with badly needed role models. And in terms of the job market, he adds that the government’s renewed support of the field—which is still largely at the planning stage—is already having “wonderful knock-on effects,” such as the construction of the Human Evolution Research Institute at the University of the Witwatersrand.

Looking ahead, Parkington sees a need to

“democratize” the science: “We should have a cast of Little Foot in every school’s classroom so that children are proud of what they have here.” The government is doing its part to promote such feelings at a higher level, for example by rejoining UNESCO and successfully nominating 13 Paleolithic caves as World Heritage sites. It has also placed rock-art images of human figures in the center of the new national crest.

“I’m enormously optimistic about the future,” says Tobias, who is retiring after a 60-year career. He was one of a minority of scientists here who were openly critical of the apartheid government’s racist policies. With apartheid finally behind them, “South Africa will be a world center for the study of human evolution,” and inevitably, says Tobias, black researchers will be leading the way. In a very real sense, he says, “we are all Africans.”

—JOHN BOHANNON

John Bohannon writes from Oxford, U.K.

Astronomers Attempt to Stay in the Big League

The South African government has made the controversial decision to invest heavily in astronomy, as an inspiration to the nation’s youth

SUTHERLAND, SOUTH AFRICA—With its shiny metal dome and white walls, the Southern African Large Telescope (SALT) looks like an alien spaceship that just touched down among the dry scrub and rust-red rocks in this corner of the Karoo plateau in western South Africa. Even more incongruous is how SALT arrived on the political scene. In 1998, only a few years after the country’s

first democratic election and while grappling with urgent problems such as poverty, homelessness, and AIDS, the South African government made a stunning proposal: It would finance half the cost of a \$20 million, world-class 10-meter optical telescope if international partners stumped up the rest. Barely 2 years later, the groundbreaking ceremony for SALT took place.

The government remains steadfast in its commitment to keeping astronomy a national priority. South Africa has made



African eyes. South Africa will soon have a world-class telescope (SALT, right) on its soil and a share in the HESS project in Namibia (above).



CREDITS: (LEFT TO RIGHT) HESS COLLABORATION; STUART GILDER