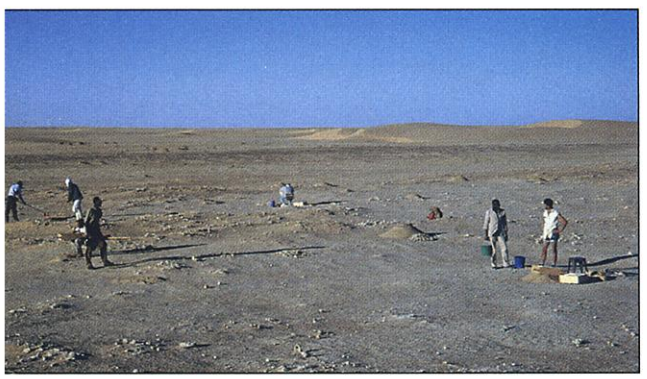
Brunet and his international team to assign them to a new genus and species, *Sahelanthropus tchadensis*. Nicknamed Toumaï, which means "hope of life" in the Goran language of Chad, it was found in beds where shifting sand dunes have exposed thousands of fossils of crocodiles, elephants, and other creatures. Brunet's team compared the mix of extinct species from the site to fauna at other reliably dated sites in Africa and concluded that the cranium is 6 million to 7 million years old, a date that is "apparently on solid ground," says White. That age pushes the limits of many molecular studies dating the split between the hominid and chimpanzee lineages to 5 million to 7 million years ago (*Science*, 15 February, p. 1217).



**Desert treasure.** Chadian and French researchers sift through rich fossil beds in the Djurab Desert.

In keeping with its age, the skull looks most like that of an ancient ape, with a brain the size of a chimpanzee's, large incisors, and widely spaced eyes like a gorilla's. But the shape and size of its canines and lower face resemble those of human ancestors that came later. When Lieberman first saw a cast of the skull, for example, he was stunned by the face. Chimpanzees and other apes have protruding lower faces. But this cranium shows "a short, vertical face" with less of a snout, says Lieberman. "These cranial features astonish me, because they are not present in many early australopithecines. It is in some respects more hominidlike than *Australopithecus afarensis*"—the species of the famed "Lucy" skeleton, dated to 3.4 million years ago and long considered an early human ancestor.

The teeth, too, are hominidlike. Although the team thinks Toumaï was probably a male because of its thick brow ridge, the canines are relatively small and unsharpened, unlike those of other great apes; many consider this trait one of the first to define hominids (along with bipedalism). This change might reflect a shift in social structure toward less competition for females, because big, sharp canines are found in males who compete furiously for mates, says Carol Ward of the University of Missouri, Columbia. Also like hominids, Toumaï has no space between its canines and incisors. "It is a dental hominid," says White.

The skull's unique mosaic of characters invites speculation about its relationships to the two other contenders for first hominid: *Ardipithecus ramidus*, which lived in Ethiopia 4.4 million to as early as 5.8 million years ago, and *Orrorin tugenensis*, which lived in Kenya about 6 million years ago. Brunet raises the possibility that Toumaï and *A. ramidus* might be "sister groups." White goes even further: "An argument could be made that [Toumaï] is an earlier species of the same genus." Comparisons are more difficult with *Orrorin*, which is so far known chiefly from teeth and limb bones rather than a skull, but *Orrorin*'s V-shaped canines are more chimplike than those of Toumaï and *Ardipithecus*.

Outside researchers do offer a caveat. If the new skull is from a female rather than a male, the canines are "less striking" and more in line with those of living and extinct apes, says Ward. Brigitte Senut of the National Museum of Natural History in Paris, co-discoverer of *Orrorin*, says, "When we saw the specimen, we thought, 'This is a female.' " She suggests that Toumaï might be an early gorilla rather than a hominid. This debate could be settled if Brunet's team finds skeletal bones that show that Toumaï was bipedal—and hence a hominid.

In the meantime, some researchers say, the skull is so different from that of other known apes that it might represent a sliver of great diversity of ancient hominids—most of which have not been found. "This fossil is a huge wake-up call," says Lieberman. "It reminds us that we're missing large portions of the fossil record."–ANN GIBBONS

CREDITS: (TOP TO BOTTOM) M. BRUNET; RON EDMONDS/AP

PUBLIC HEALTH

## AIDS Researcher Named CDC Chief

Julie Gerberding, an infectious-disease researcher who rose to public prominence last fall as a spokesperson for the U.S. government's response to the anthrax crisis, has been named director of the Centers for Disease Control and Prevention (CDC) in Atlanta. Gerberding, 46, is a CDC insider. She was recruited to CDC in 1998 from the University of California, San Francisco (UCSF), to run a national program aimed at controlling hospital infections and medical errors and was promoted to her new job from acting deputy director for science.

Making the announcement on 3 July, Sec-

## ScienceScope

**Blood Saga** The 14-year French court battle over the contamination of an estimated 4000 hemophiliacs and blood transfusion recipients with HIV took two new twists last week. But there's still no end in sight.

On 4 July, an appeals court dismissed all charges—including accusations of "poisoning"—against 30 doctors, researchers, and public health officials who allegedly had failed to protect the victims from infection with the AIDS virus during the early days of the epidemic in France. But 5 days later, prosecutors announced that they would take the case to the final appellate level.

The list of those still awaiting their fate include respected scientists such as cell biologist François Gros and epidemiologist Jean-Baptiste Brunet (*Science*, 16 June 1995, p. 1563). Colleagues complain that the government has little basis for an appeal but is merely trying to prolong their legal torment. "This was a politically correct" decision, says immunologist Jean-Claude Gluckman of the St. Louis Hospital in Paris.

**No Litmus Test** National Institutes of Health (NIH) director Elias Zerhouni says that White House officials vetting his appointment never asked him about his views on human embryonic stem (ES) cells. Meeting last week with reporters for the first time since he took office 6 weeks ago, the former Johns Hopkins radiologist says that he is ready to argue for loosening Bush Administration rules that limit ES cell studies to 70-some lines if the science supports that position. But "the science is barely out of the gate," he adds. As for congressional proposals to ban therapeutic cloning, "that's a political question, not a scientific question," he said.

On other topics, Zerhouni says that NIH "needs to look into" a recent National Academy of Sciences suggestion that it find a way to fund worthy research on combating bioterrorism more quickly. He also plans to "review the effectiveness" of NIH, with input from a forthcoming academy study examining the agency's structure. His short-term priorities include filling five vacant NIH directorships.

retary of Health and Human Services Tommy Thompson praised Gerberding for having "the right mix of professional experience and leadership skills" to run the agency as it focuses on new infectious disease threats. The appointment does not require congressional approval. Nevertheless, Senator Edward Kennedy (D–MA), chair of the Senate panel that reviews health policy, chimed in last week that Gerberding is "a strong public health leader" and "a superb choice."

Gerberding, CDC's first female director, appeared in televised briefings and in congressional hearings last fall to explain how the anthrax bacterium causes infection and how to guard against it. "She's a great teacher," says a former UCSF colleague, Paul Volberding, adding that CDC should benefit from her public communication skills. He also notes that during the 1980s and 1990s, Gerberding organized "an incredible consultation service" that worked around the clock to advise health workers and prevent the spread of HIV infection at San Francisco General Hospital.

CDC has been through a rocky period in the past 8 months, observers say, and many hope this appointment will boost morale. Some members of Congress criticized the agency for what they saw as an uncoordinated response to the anthrax mail attacks. CDC's operational response, says Tara O'Toole, director of the Johns Hopkins University Center for Civilian Biodefense Strategies in Baltimore, "was a little rusty." CDC's most recent director, Jeffrey Koplan, resigned on 31 March, leaving the agency without a permanent chief for 3 months.

**Inside choice.** Julie Gerberding advances from science chief to director of CDC.

Gerberding is "a terrific appointment," says O'Toole: "She has great scientific credentials, she's experienced in the real world, and she knows the CDC as an insider." James Curran, a former CDC epidemiologist who is now dean of the Rollins School of Public Health at Emory University in Atlanta, agrees: "She will be an energetic leader for CDC at a time when concerns about bioterrorism and infectious disease are paramount." But others, such as Barry Bloom, dean of the Harvard School of Public Health in Boston, warn that any insider like Gerberding faces a big challenge. "It is time to reexamine the architecture of the CDC and its relation to the other U.S. public health agencies," Bloom says, but it will be hard to bring order to the conflicting fiefdoms.

–ELIOT MARSHALL

MATHEMATICS

## NSF to Double Number Of Math Institutes

American mathematics just multiplied itself by two. On 1 July, the Division of Mathematical Sciences (DMS) at the National Science Foundation (NSF) announced the creation of three new mathematical sciences research institutes, bringing the total number of such NSF-funded institutes to six. DMS's director, Philippe Tondeur, says he has "incredibly high expectations" for the institutes, which he describes as "vessels for start-up activities."

**Castle on a hill.** The American Institute of Mathematics' Research Conference Center in Morgan Hill, California, will host focused workshops.

The new institutes will bring together mathematicians and scientists to work on problems ranging from algebraic geometry to neuronal modeling. The institutes, chosen in a nationwide competition, are the Mathematical Biosciences Institute (MBI) at the Ohio State University, Columbus; the Statistical and Applied Mathematical Sciences Institute (SAMSI), a consortium led by Duke University in Durham in collaboration with North Carolina State University in Raleigh, the University of North Carolina, Chapel Hill, and the National Institute of Statistical Sciences in Research Triangle Park; and the AIM Research Conference Center (ARCC) at the American Institute of Mathematics in Palo Alto, California. They join the Mathematical Sciences Research Institute at the University of California, Berkeley; the Institute for Mathematics and Its Applications at the University of Minnesota, Minneapolis; and the Institute for Pure and Applied Mathematics at the University of California, Los Angeles. MBI and SAMSI will each receive $10 million from NSF over the next 5 years; ARCC is slated for $5 million.

MBI will kick off with a yearlong program on neuroscience, including neuronal modeling of olfactory, auditory, and sensorymotor systems. "The mathematical sciences proved valuable in completing the genome project," notes MBI director Avner Friedman. "The promise of the future is even greater." SAMSI has programs lined up on statistical aspects of environmental modeling and inverse problems. ARCC is to hold workshops on specific problems—the first, scheduled for December, will focus on algebraic geometry—and create a permanent "workshop Web site network" for each.

"We're at an exciting juncture," says Tondeur, who is stepping down as director of DMS this month after overseeing a dramatic 70% increase in NSF math funding over the past 3 years (from $106 million in 2000 to $182 million budgeted for 2003). Mathematics institutes are a "very low cost" way of bringing people together for focused research, he says.

–BARRY CIPRA

VIROLOGY

## Active Poliovirus Baked From Scratch

With mail-order DNA and more than 2 years of painstaking work, researchers for the first time have assembled a virus from its chemical code. The lab-built poliovirus killed mice and was almost indistinguishable from the original. Biologists disagree on how difficult it would be to construct far bulkier viruses such as smallpox to create bioweapons.

Scientists hail the research, described online this week by *Science* (www.sciencemag.org/cgi/content/abstract/1072266), as a technical achievement. But in an age when anthrax travels through the mail, few could avoid the paper's obvious implications, both for polio—a disease that once triggered panicky epidemics and is now nearing global eradication—and other viral diseases. "It is a little sobering to see that folks in the chemistry lab can basically create a virus from scratch," says James LeDuc, director of the Division of Viral and Rickettsial Diseases at the Centers for Disease Control and Prevention in Atlanta. Vincent Racaniello, a virologist at Columbia University in New York City, was more blunt. "Poliovirus," he says, "will never be gone."

A genomic runt at just 7741 bases, poliovirus is composed of a single strand of RNA and ranks among the most thoroughly dissected viruses of all time. Once it infects

CREDITS: (TOP TO BOTTOM) STOTTLER DESIGN GROUP; CDC