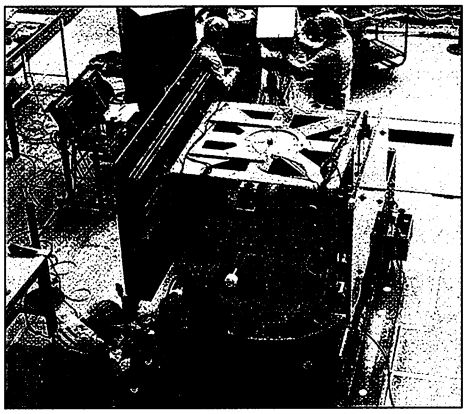


Fine-tuning. Europe's Smart-1 undergoes tests in the Netherlands.

CREDITS: (TOP TO BOTTOM) ESA; DAVID JENNINGS/AP

however, disagree. Although the mission "will create a massive data set on the moon, much of it unfortunately would not add materially to the things we already know," says lunar researcher Wendell Mendell at NASA's Johnson Space Center in Houston. Mizutani counters that "the quality and precision of the Selene instruments will provide much better data than those obtained by previous or existing observations."

A second Japanese probe, the $100 million Lunar-A, will swoop to within 40 kilometers of the surface in 2005 and launch two "penetrators"—80-centimeter-long projectiles that will pierce the surface to a depth of up to a few meters. Positioned on opposite sides of the moon, the sensors will monitor seismic waves traveling through its core. Analysis of the waves should reveal the size of the moon's core and determine whether or not it is liquid. Sensors on the penetrators will also measure heat flow through the crust, essentially taking the moon's internal temperature. "These geophysical data would be tremendously important toward understanding the moon as a planet," says Mendell.

The aim of ESA's more modest Smart-1 is to test new technologies, such as solar-powered ion propulsion, for later missions including ESA's Bepi-Colombo probe to Mercury. After the $80 million spacecraft is launched at the end of 2002, it will take 16 months to reach the moon, using only sunlight to drive it. Solar panels will provide the power to ionize xenon atoms and fling them out the back of the craft. "It is the first time that it will be used as a primary means for transportation," says Foing, ESA's project scientist for Smart-1.

Smart-1's tiny suite of six sensors, weighing only 15 kilograms in all, may help explain the moon's origin. In the most widely accepted theory, the moon is a bit of Earth broken off by a collision with a Mars-sized object. If so, the relative abundances of the moon's common constituents—iron, magnesium, and aluminum—should match those on Earth. Smart-1 will create a global map of abundances. The most important ratio is magnesium to iron, says Manuel Grande, a space physicist at the Rutherford Appleton Laboratory near Oxford: "That number really constrains whether the Earth and moon come from the same place."

Just as Cold War politics whipped up the moon frenzy in the 1960s, political forces may be behind the upcoming moon shots, some analysts contend. "The Selene mission ... is really the first step toward a resource-oriented commercial development," contends Mendell. Mizutani, however, insists it is far too early to talk about exploiting the moon. "We will need more basic study," he says. **–ALEXANDER HELLEMANS**

Alexander Hellemans is a writer in Naples, Italy.

STEM CELL RESEARCH

Reports Give Green Light in Australia, Israel

BERLIN AND MELBOURNE—Two countries at the forefront of work on human embryonic stem (ES) cells, Australia and Israel, have just recommended policies to ease the way for their researchers.

After 2 years of deliberation, an Australian government committee has endorsed legislation that would allow both ES cell research and the derivation of ES cells from unwanted embryos created during fertility treatments. The 10-member committee, made up of members of parliament, also called for a national licensing body to monitor and regulate all such research, whether publicly or privately funded. And although the parliamentarians unanimously condemned the use of ES cells for reproductive cloning, they left open the door to the creation of embryos as a source of genetically matched ES cells—so-called therapeutic cloning—by calling for a 3-year moratorium on the practice. The Australian government is expected to seek legislation to implement the recommendations.

This stands in stark contrast to restrictive conditions imposed on U.S. researchers. On 9 August, President George W. Bush announced that federally funded scientists could obtain ES cells only from existing cell lines; shortly before, the U.S. House of Representatives passed a bill that would ban cloning for research purposes.

In Australia, Catholic commentators condemned the report for failing to ban outright the creation of embryos for research. But medical ethicists such as Helga Kuhse of the University of Melbourne and Monash University believe the committee should have gone further. "I can't see why scientists should be limited to surplus embryos" from fertility treatment, she says. "Embryos are hard to come by, and, to me,

ScienceScope

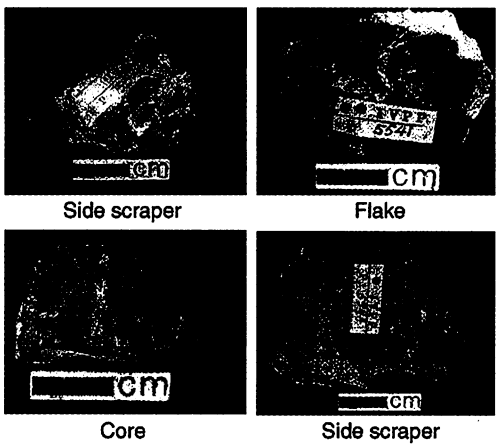
Court Asked to Reconsider Several academic groups are asking the Maryland Court of Appeals to reconsider part of a recent decision that they say could halt "virtually all" research involving children.

The 16 August ruling, which concerned a study of home lead cleanup by the Johns Hopkins University (JHU)–affiliated Kennedy Krieger Institute, says no child or legally impaired adult should be allowed to participate in "nontherapeutic" studies involving "any risk" (*Science*, 31 August, p. 1567 and 14 September, p. 1997). This sweeping wording "would have a devastating impact" on research by barring standard procedures such as needle sticks and the use of placebos, says an amicus brief filed by JHU, the Association of American Medical Colleges, the Association of American Universities, and the University of Maryland Medical System. The groups ask the court to rescind this portion of the decision. An AAMC spokesperson says the court has indicated it may hear the appeal in October.

West Nile Watch The West Nile virus keeps popping up in more U.S. states. In the last month, health authorities in Maine, Illinois, Wisconsin, Iowa, Kentucky, Alabama, and Tennessee reported detecting the agent in birds or other animals for the first time.

West Nile, which had never been found in the Americas until it hit New York City in 1999, has now been reported in 24 states and the District of Columbia, and "we need to assume that it's going to spread throughout the country," says Duane Gubler, head of the Centers for Disease Control and Prevention's arthropod-borne virus lab in Fort Collins, Colorado. Gubler suspects that migratory birds transported the virus to southern states such as Florida and Louisiana in the fall of 1999 or 2000; from there, it probably hitched a ride to the northern Midwest this spring.

So far, the human toll has been relatively low: Early this week, there were 26 reported or suspected cases, including one fatality, compared to 62 cases in 1999 and 18 last year. And even if it conquers the rest of the country, good surveillance, prevention, and control measures should prevent the virus from becoming a major public health threat, says Gubler: "This is a virus we can deal with."



Stone ages. New dates put these stone tools from China at 1.36 million years old.

1 million years old, but dating sediments in China has been notoriously difficult because there is no volcanic material for radiometric methods. So the Chinese and American team used high-resolution paleomagnetic dating, relying on known, ancient shifts in Earth's magnetic field to tie the tools to a particular period, says Rixiang Zhu, a geophysicist at the Institute of Geology and Geophysics at the Chinese Academy of Sciences in Beijing.

The members of Zhu's team hung from ropes alongside steep hillsides at two sites in the basin, sampling soil every 25 to 35 centimeters in a vertical column that cut through the horizontal layers of sediment, including the layer of grayish-white clay in which the tools were deposited. This clay layer was laid down during a long period when Earth's polarity was flipped. Sediments bearing the signature of this reversed polarity are sandwiched between a layer indicating normal polarity—a period dated radiometrically at Africa's Olduvai Gorge to 1.77 million to 1.95 million years ago—and another normal-polarity layer dated to 1 million years ago. From the location of the clay layer in the band of reversed-polarity sediments and an estimated sedimentation rate, Zhu and his team, including geophysicist Ken Hoffman of California Polytechnic State University in San Luis Obispo, concluded that the tools were at least 1.36 million years old. The team's efforts impressed dating expert Brown, who calls it "great work" that provides a "jumping-off point" for dating other basin sites.

Although no human fossils have been found in the basin, the tools' antiquity shows that early humans had already managed to adapt to life at 40 degrees north, says coauthor Rick Potts, a paleoanthropologist at the Smithsonian Institution in Washington, D.C. But he adds, "What were they doing at the margin of the range for hominids? How did they adapt to this northern climate?"

Potts speculates that the climate may have been relatively warm at the time and that the toolmakers had to adapt to life in the north because the massive Qinling Mountains blocked them from migrating south. To reach the site, *H. erectus* had to cross the Tibetan Plateau and somehow get around the Himalayas. Regardless of how they got there, says archaeologist Kathy Schick of Indiana University in Bloomington, who has worked at tool sites in the basin since 1989, these dates show that "very early on, *Homo* had the capability to spread out of Africa and to move significantly northward across long distances with relatively simple tool kits."

–ANN GIBBONS

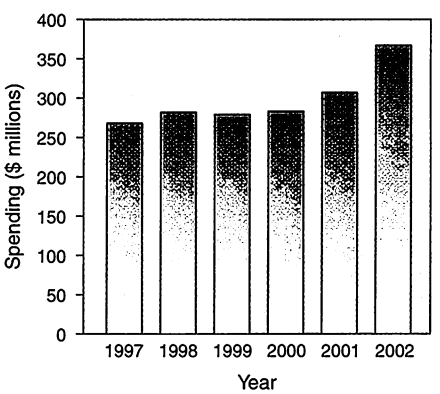
FRENCH SCIENCE

Budget Backs University Research, Job Creation

PARIS—As fears of war and economic recession sweep the world, French scientists got at least a sliver of good news last week. New budget proposals would boost grant money for long-suffering university researchers by nearly 20%, while public research agencies would be able to hire 500 additional researchers and technicians.

The big picture for science is more sobering. France's civilian R&D budget increase in 2002 would barely beat inflation, rising 2.2% to $8 billion. That modest growth would, however, put science in a better position than many other public sectors: The overall government budget is set to increase by a meager 0.5%. Not surprisingly, the mixed news is drawing mixed reviews: Whereas some French scientists welcome the spending plans, others complain that French R&D will gain little ground on R&D in the United States and other research powerhouses.

At an 18 September press conference announcing the new budget figures—which are subject to parliamentary approval later this year—French research minister Roger-



Good news. With a 19.3% increase next year, French university research would be a big winner.

ScienceScope

Self-Policing Clinical researchers at the University of Michigan (UM) are taking steps to keep ahead of ethics regulators. In a "proactive" move, says spokesperson Kara Garvin, a review of genetic and molecular medicine this year resulted in stepped-up oversight of all clinical protocols and a 3-year suspension of research privileges for Alfred Chang, a top cancer investigator.

The self-initiated audit, according to the university, turned up inadequate or late documentation of informed consent, noncompliance with protocols, and improper reporting of adverse events. Chang's suspension and a decision to quadruple spending on clinical oversight, announced several weeks ago, are designed to reinforce "the importance of the rules governing clinical research trials, particularly those protecting human volunteers," said UM vice president Gilbert Omenn.

In a Web posting (www.umich.edu/%7Enewsinfo/Releases/2001/Aug01/chang.html), Chang argues that many patients had benefited from his studies but acknowledges the need for better compliance with the rules.

Stem Cell Fight The Wisconsin Alumni Research Foundation (WARF), which holds the patent on human embryonic stem cells, has gone to court again in a bid to curb efforts by biotech company Geron to expand its claims over WARF's cell lines. The California company has an exclusive commercial license to use six types of cells derived from the Wisconsin stem cells, but it is claiming it still has an option for more.

WARF says no, it doesn't want all its cells tied up by Geron and unavailable to other researchers, and it filed suit on 13 August to get a federal court to back up its reading of its agreement with the company. This week, WARF added a stipulation to the complaint: It wants the court to declare that Geron—contrary to the company's claim—has no exclusive rights to "research products" of the stem cells, such as cell-based screening assays, except where they have been combined with Geron's own patented technology.

"We're anxious to be able to license other companies to make research products ... without the cloud of Geron claiming that we've breached the agreement," says WARF managing director Carl Gulbrandsen. A Geron spokesperson says the company doesn't comment on pending litigation.

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