and now—argues for water travel, says Sandweiss. "If you had watercraft, then you could carry water and you could move more quickly" than traveling overland, he says.

Even researchers who have invested their careers searching for the earliest South Americans in highland sites are now giving the maritime idea serious consideration. "I've long pushed the idea of people moving down the flanks of the mountain zone all the way from the Isthmus of Panama down the Andes," says archaeologist Tom Lynch, director of the Brazo Valley Natural History Museum in Bryan, Texas. "But it may be that people actually came along the coastal fringe." –HEATHER PRINGLE

Heather Pringle is a writer in Vancouver, British Columbia.

ANIMAL EXPERIMENTATION

Strict Rules Rile Indian Scientists

NEW DELHI—Proposed rules to create a government-run system to regulate research using animals have triggered a fierce debate in India. Drafted by a committee chaired by social justice minister Maneka Gandhi, an outspoken animal-rights activist, they are set to go into effect on 8 October. But research groups are trying to block them, arguing that they are extreme and threaten valuable research.

PALLAVA BAGLA

Government guardian. Social justice minister Maneka Gandhi says rules are meant to protect "my animals."

Issued last week, the proposed rules would require all labs doing animal experimentation to register and obtain prior written approval from the government. They would effectively ban animal testing and other contract work for foreign institutions and companies by prohibiting any research done on behalf of unregistered institutions. Registered labs would also need to provide quarterly updates on their activities and could neither transfer nor acquire animals without permission. Gandhi describes the proposed rules "as conforming to well-established norms adhered to in the West."

The new system would be run by the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), which Gandhi chairs. It would supplant voluntary guidelines issued in 1992 by the Indian National Science Academy. Last week the committee released a survey done by a private advocacy group that found that many of the country's leading research labs haven't been following even those guidelines. "Why should my animals be subjected to cruel tests for the sake of Western companies?" Gandhi said in an interview with *Science*. "I am very happy that there will be more paperwork [for the scientists]. ... They are used to doing whatever they feel like. Now they will have to fall in line."

Perhaps, but not quietly. Last week officials from the National Academy of Sciences urged Prime Minister Atal Bihari Vajpayee to prevent the implementation of the proposed rules. A dozen heads of biomedical labs and secretaries of government scientific departments also met last week and called for more discussion. "They are fraught with serious consequences to the progress of biomedical research in India toward new vaccines and new drugs," says Vulimiri Ramalingaswami, a pathologist and former chief of the Indian Council of Medical Research (ICMR). International research would also be jeopardized, says Chhitar Mal Gupta, director of the Central Drug Research Institute in Lucknow, which has a long-running project with the U.S. Walter Reed Army Institute of Research testing new therapeutics against malaria. "This collaboration will fall apart and drug development will be shattered," he says.

Each year Indian scientists at 5000 laboratories use more than 5 million animals—ranging from frogs and rats to monkeys and buffaloes—at a cost exceeding $10 million. India has traditionally been a major source for experimental Rhesus and Bonnet monkeys caught in the wild, and several international pharmaceutical companies stepped up their animal testing facilities in the country after a 1978 ban on exports. Experts say that such tests cost one-tenth as much as they would in the West.

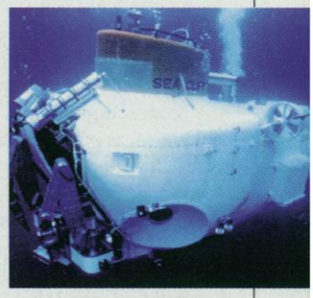
Institutions are supposed to follow the academy's voluntary guidelines, which lay down broad policies on housing and feeding of animals and proper experimental procedures. They specify that all institutions should have animal ethics committees that must include at least one outside scientist and one member of the public. Whereas ICMR Director-General Nirmal Kumar Ganguly says that "all Indian institutes are conforming to the [academy] guidelines," a new survey carried out at the behest of the CPCSEA found otherwise.

The survey released last week found that of 30 labs sampled (including many national research institutes, pharmaceutical companies, and at least one veterinary college), only half had any form of animal ethics committee, and only two had any outside members. In fact, *Science* has learned that

ScienceScope

VINTAGE SUB AWAITS FATE

Scientists are trying to decide whether to retool a new gift to science—a Cold War submersible—or strip it for parts. Either way, they say, U.S. oceanographers could profit.



WHOI

Sea Cliff. Spare parts?

Last month, the U.S. Navy delivered *Sea Cliff* to the Woods Hole Oceanographic Institution (WHOI) in Massachusetts. The submersible has cruised to 6000 meters below the surface—the deepest of any U.S. sub—while on military search-and-recovery operations. Now, engineers are evaluating how much it would cost to outfit the vintage-1968 craft for civilian research.

If making the switch proves too expensive, researchers may transfer the *Sea Cliff*'s sturdy lights, arms, and other gear to WHOI's underwater flagship, the *Alvin*. But the retrofit can't impair *Alvin*'s reliability, says Dick Pittenger: "In trying to make *Alvin* better, we don't want to lose what we've got."

CANADA'S UNIVERSITIES SHY AWAY FROM FASTER INTERNET

Who should be using Canada's next-generation Internet? That question is being debated in the wake of a review claiming that too few academics are taking advantage of the high-speed data pipeline.

In a report obtained by *Science*, external reviewers found that only 28 of Canada's 80 universities are linked to the CA*net II electronic backbone, which became operational in 1996 and can transmit data at speeds reaching 100 megabytes per second. The panel concluded that high hookup costs—which schools must bear by themselves—are keeping many universities off-line.

Bill St. Arnaud of the Canadian Network for the Advancement of Research, Industry & Education (CANARIE), a CA*net II architect, says the network was never intended to lure academic users. Rather, he says, it is designed to foster Internet commerce. Scant university use, however, could prove problematic when CANARIE makes its pitch later this year for $80 million in government funds to complete the third phase of its networking projects. One government official's ironic take on the issue: "We built it and no one's using it—there's a real incentive to support phase 3."

SCIENCE EDUCATION

A Record Grant for College Programs

The Howard Hughes Medical Institute (HHMI), best known for picking elite researchers and providing them with generous funding, announced this week that it is making a huge investment in the next generation of potential Hughes investigators. It will provide the largest grant in U.S. history to support undergraduate education in biology: $91.1 million to 58 universities.

The initiative will serve "to train the next generation" of biologists, says Joseph Perpich, HHMI's vice president for grants and special programs. "But it's also to provide very strong biology education to anyone who wants it." The new grants, which range from $1.2 million to $2.2 million over 4 years, continue an undergraduate science program Hughes launched 10 years ago. All but four of the recipients have received grants in the past.

Existing HHMI-funded programs range from a Biology Scholars Program at the University of California, Berkeley, that reaches out to women and minorities underrepresented in the life sciences, to matching undergraduates with faculty members conducting lab research at the University of Arizona, Tucson. That program has expanded from 19 participating faculty members in 1988 to more than 230 today. HHMI support for undergraduate science "has really helped change the value system at research universities," says Sam Ward, a professor of molecular and cellular biology at the University of Arizona and program manager for the HHMI grant.

One of the rookies in this year's program, Clemson University in Clemson, South Carolina, plans to spend its $1.6 million grant on a combined effort among the biology, education, and earth science departments in training middle and high school teachers in hands-on biology methods. The University of Arizona, one of two schools receiving the maximum grant of $2.2 million, will also use some of its money to support teacher training. It plans a sabbatical program in which high school science teachers will spend a year on campus studying science.

HHMI announced its new round of awards just a week after the National Research Council (NRC) released a report that pointed to a glut of life sciences Ph.D.s flooding the academic job market (*Science*, 11 September, p. 1584). Perpich says this new series of grants is not aimed at pushing more biologists into that pipeline. The intent, he says, is to produce graduates better educated in the life sciences, regardless of what career path they choose after college.

C. J. WALKER

One on one. In University of Miami program, undergrads conduct research with professors.

Shirley Tilghman, a biologist at Princeton University who chaired the panel that wrote the NRC report, agrees: "I'm 100% behind these undergraduate science grants." Tilghman, an elite Hughes investigator herself, says the Hughes grants "stimulate faculty [members by] giving them the resources" and the freedom to implement innovative teaching methods. –JENNIFER COUZIN

BIOMEDICAL RESEARCH

China Sets Rules for Foreign Collaboration

BEIJING—China is about to issue new rules governing the export of human genetic materials that will provide a legal framework for foreign collaborations in biomedical research. The rules strengthen the rights of patients involved in international studies and establish a formula for sharing any commercial proceeds among the collaborators. Although scientists who have read the rules generally applaud them, some worry that the additional bureaucratic procedures—including the collection of fees by local authorities at the start of a project—could raise the cost and extend the duration of many projects.

The regulations, drafted by the Ministry of Health and the former State Commission of Science and Technology (now a ministry), will tighten controls on work being done in China by outside researchers and pharmaceutical companies. Press reports of such activities, including one in *Science* (19 July 1996, p. 315), triggered concern that foreigners were plundering China's genetic resources. As a result, all such collaborations ground to a halt last year while the government drafted the new rules (*Science*, 17 October 1997, p. 376).

ScienceScope

RUSSIAN FRONT OPENS IN OZONE FIGHT

The campaign to heal Earth's protective ozone layer is shifting to a new battleground. Last week, United Nations officials marked the 11th anniversary of the 1987 Montreal Protocol—the global pact that calls for phasing out key ozone-destroying chemicals, such as chlorofluorocarbon (CFC) refrigerants—by pledging to help cash-strapped Russia make good on Soviet-era promises.

Scientists predict that Earth's eroded ozone layer, which screens out the nastiest ultraviolet radiation, can be restored by 2150 if nations adhere to the Montreal pact. But some signatories, including Russia, have missed deadlines for ending the manufacture of CFCs and other ozone eroders. Now, in an effort to put tardy nations back on track, the United Nations and the World Bank will pay to put CFC producers out of business. In Russia, for instance, the bank plans to spend $25 million to buy out Russian CFC facilities and close them down by 2000.

RESEARCHERS SEEK CONSENSUS AT MERCURY SUMMIT

A simmering debate among public officials about the health risks from eating mercury-tainted fish will soon get a public airing. In November, the White House will gather experts to review key studies in the hope of ironing out lingering disagreements.

Officials are at odds over how to interpret two ongoing studies of how mercury in fish affects the neurological development—memory and motor skills, for example—of children in the Faroe and Seychelles islands. Last December, the Environmental Protection Agency (EPA) recommended a safe level of no more than 0.1 micrograms of mercury per kilogram of fish, a level supported by the Faroe Islands study. But other agencies have set less stringent levels and say they're backed by the Seychelles results.

NEWMAN/GREENPEACE

Investigators from both studies will be at the mercury summit, hosted by the National Institute of Environmental Health Sciences in North Carolina. The plan is to "sift through the evidence ... and see if we can build a scientific consensus," says White House official Fran Sharples.

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