Briefings

edited by CONSTANCE HOLDEN

World Bank Environment Fund

The World Bank, which has been hounded for years by environmentalists for failing to heed the consequences of its loan policies, is setting up a fund called the Global Environment Facility (GEF) to help finance the environmental aspects of development projects. Proposed 2 years ago by France, the idea was formally agreed upon at a meeting in Paris last November. Commitments totalling $1.5 billion have been made for a 3-year pilot program offering low-interest loans and grants in four areas: global warming, marine pollution, biodiversity, and ozone depletion.

According to Nicholas Van Praag of the bank's environment department, the fund will help poor countries obtain money to make a needed project environmentally defensible—for example, adding scrubbers to a proposed power plant using high-sulphur coal. The fund will also encourage more participation by nongovernmental organizations—for example, in planning small biodiversity projects, says Van Praag.

U.S. environmental groups are all in favor of such a fund but don't think the World Bank is the place for it given its lamentable record, according to Bruce Rich of the Environmental Defense Fund. He says the money is merely "a drop in the bucket" toward ameliorating the effects of projects, particularly in forestry and energy, that are ill-advised to begin with.

Proving Einstein Right (or Wrong)

According to legend, late 16th-century Italian scientist Galileo Galilei performed a simple experiment in which he dropped a lead and a wooden cannonball from the leaning tower of Pisa and showed that the different masses struck the ground at the same time. Now, two Stanford physicists, C.W. Francis Everitt and Paul Worden Jr., have proposed a test of this principle—now known as the equilvalence of inertial and gravitational mass—that they say will improve the accuracy of Galileo's results by 14 orders of magnitude.

The principle is the foundation for Einstein's geometrization of gravity in his general theory of relativity. It stems from the fact that unlike other fundamental forces—electromagnetism and the strong and weak nuclear forces—gravitational acceleration can be expressed as a function of mass and is therefore comparable to inertial accelerations. "The more you think about it, the stranger this is," says Everitt. Any breakdown in the equivalence of gravitational and inertial mass would show limits to the theory of relativity.

To test the limits of equivalence, the two physicists have proposed a satellite-based experiment consisting of three differential accelerometers, each a solid rod floating within a hollow cylinder. If the equivalence principle holds, as expected, the rod will remain centered in the cylinder as the satellite orbits the earth. Any "drifting" of the rod will indicate that gravity is tugging more strongly at one of the two objects, leading them to travel in slightly different orbits.

If approved by the European Space Agency—which is cosponsoring the project with NASA—the experiment might be lofted into orbit by the end of the decade. Price tag: $18 million for the launch alone.

Fine Arts Gallery of San Diego

Galileo. *An era of cheap science.*

Looking for Planets

In the past decade, there have been tantalizing hints—from both ground- and space-based telescopes—that there are planets orbiting stars other than our sun. While there have been no confirmed discoveries, the National Research Council thinks the time is ripe for an aggressive search for new planetary systems. Such a program would be "technologically feasible, scientifically exciting, and richly rewarding," says a report by the NRC Committee on Planetary and Lunar Exploration.*

The report is the product of 6 years of study by a 29-member committee headed by University of Colorado astronomer Larry Esposito. It calls for a decade-long hunt for extrasolar planets, accompanied by laboratory studies to understand how planetary systems form, and theoretical and computer models to guide the search. "We want to go beyond what we know about our solar system," says Esposito. "We want to know how common a phenomenon it is to have planets, and to compare our solar system with other planetary systems."

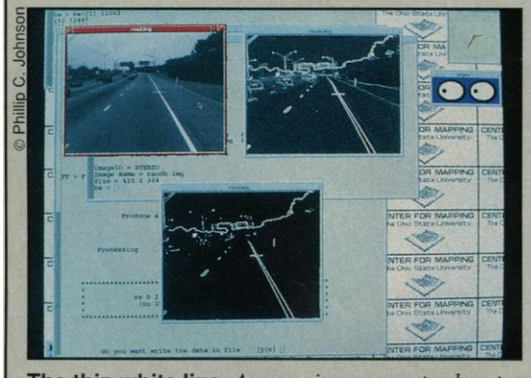
The report includes no cost estimates, and funding prospects may seem dubious at a time when approved projects such as the space station are being cut back. But Esposito says that NASA is already aiming in the right direction: The planetary division is spending about $.5 million this year on research and planning for a search that would

Cruising the Digital Highway

It's late, and you've taken the wrong exit off the interstate. You don't know where you're headed, and your road atlas is out of date. So you flip a switch on the dashboard and let your car's navigation system plot a course to your destination.

Science fiction? Not to Ohio State University's Center for Mapping, where a team led by geodesist Phillip Johnson has a new way to make computer-readable digital maps—a basic element of the infrastructure necessary to support "smart" cars. These days, such maps are produced (for monitoring road conditions) by individually digitizing existing maps, a costly, time-consuming, and ultimately not very accurate procedure. Johnson's team has taken a more direct approach by digitally mapping the highway itself.

Outwardly, their mapping vehicle—a standard Ford van with two externally mounted digital videocameras—is not overly impressive. But inside, sophisticated equipment records the van's exact location by obtaining readings from the Pentagon's Global Positioning Satellite system. The combination of video input and precise positional information makes it possible to create a high-quality digital road map in about the time it takes to drive down the highway, plus additional time for post-processing.



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The thin white line. *A mapping computer locates the edge of the road in a video image.*