lar system on the winds of a nearby supernova explosion or, perhaps, spawned by particles from the young sun, ^{26}Al was first proposed as a heat source for the early solar system back in 1955. With a half-life of 730,000 years, ^{26}Al could have melted early asteroids, then disappeared long before our own planet grew to full size. But it wasn't until the mid-1970s that researchers found indirect evidence for ^{26}Al's existence: the presence of its decay product, magnesium-26, in calcium-aluminum–rich inclusions, the first specks thought to have formed in our solar system's primordial gas cloud and

Clue to early solar system. A rare isotope hints at the energy source responsible for melting the parent asteroid that spawned this ancient meteorite, found in India.

preserved in ancient meteorites. But researchers came up empty-handed when they looked for ^{26}Mg in meteorites from parent asteroids that once had molten interiors. Complicating the search, these so-called differentiated meteorites make up fewer than 5% of those that hit Earth.

Lucky for Srinivasan and his colleagues, just such a meteorite thundered into the desert state of Rajasthan in western India on 20 June 1996. Called Piplia Kalan after a nearby village, the 42-kilogram meteorite resembles basalt, and its tiny crystals suggest it cooled rapidly after melting. Auspiciously, one section contained crystals of plagioclase, an aluminum-laden mineral that might once have been rich in ^{26}Al. And compared to most other differentiated meteorites, the grains contained little magnesium. That led Srinivasan and his team to think they had a good shot at finding the ^{26}Mg produced by ^{26}Al decay, which would be swamped by common magnesium in most plagioclases. Indeed, ^{26}Mg levels in four grains of Piplia Kalan were up to 3% higher than the usual amount in terrestrial plagioclase. By cosmic chemistry standards, says Srinivasan, "this excess is very significant."

The finding "strengthens implications that ^{26}Al was the heat source" at the heart of asteroids, says Glenn MacPherson, a geochemist at the Smithsonian Institution in Washington, D.C. For connoisseurs of asteroid history, it also suggests how long it took for the parent body of Piplia Kalan to melt and cool after the formation of the solar system. Like measuring time according to sand in an hourglass, our solar system's initial allotment of ^{26}Al can be extrapolated from the ^{26}Mg in calcium-aluminum inclusions. The tricky part is that in molten rock, the hourglass wouldn't collect falling sand, so to speak, because any ^{26}Mg would have been elbowed out of minerals that prefer aluminum atoms. After the molten rock cooled into crystals, however, the ^{26}Mg would become trapped and begin to accumulate; its abundance would reveal that of ^{26}Al during crystallization. By comparing ^{26}Mg abundance in the calcium-aluminum inclusions to the vastly smaller amount in Piplia, the team estimates that 5 million years must have elapsed before the plagioclase in Piplia crystallized. This time span for accreting and melting the parent body jibes with computer models of the process, providing "a real shot in the arm for theoretical work," says geochemist Richard Carlson of the Carnegie Institution in Washington, D.C.

The hunt is on for longer lived isotopes, such as samarium-146, manganese-53, and iron-60, that may have been trivial heat sources in the early solar system but, by their abundance in differentiated meteorites, could help narrow the window on when asteroids began solidifying. Such radiometric dates "will help explain processes operating 4.6 billion years ago in the inner solar system," says Srinivasan. And that, notes Carlson, could help us better understand modern features of our solar system, such as the chemical composition of different planets.

–ERIK STOKSTAD

CREDITS: (TOP) G. SRINIVASAN; (BOTTOM) DAVE CHESKIN/PRESS ASSOCIATION NEWS

ENVIRONMENTAL POLICY

EPA's Piecemeal Risk Strategy on Way Out?

In diagnosing the ailments afflicting the Florida Everglades, researchers at first painted phosphorus as the archvillain: The nutrient, they concluded, nurtured the cattails that choked the saw grass and sent many species into decline. Among the staunchest advocates of this message were Environmental Protection Agency (EPA) scientists, who since the 1970s had trained a harsh light on phosphorus

ScienceScope

Opening New Vistas British astronomers have secured $36 million for a new telescope that will map the southern skies. The 4-meter Visible and Infrared Survey Telescope for Astronomy (VISTA) will be located in Chile and capture more than 100,000 stars and galaxies in every 10-minute exposure, researchers announced. "This will be the largest telescope fully dedicated to surveys," claims Jim Emerson of the Physics Department at Queen Mary and Westfield College in London, who heads an 18-university consortium planning the instrument.

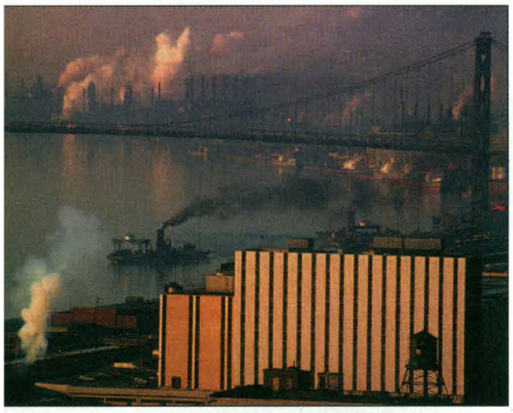
Britain's Joint Infrastructure Fund coughed up cash for the project, which will flag interesting objects that can be studied in depth by more powerful telescopes. VISTA's broad scope "will unquestionably identify many unusual [objects]," says astronomer Bruce Margon of the University of Washington, Seattle. But planners are still figuring out exactly where to put their new eye on the sky, which is expected to see first light in 2004.

Altered Food Redux A study that stirred concerns over the safety of genetically modified (GM) foods in the United Kingdom was seriously flawed, a scientific panel has concluded. Last year, biochemist Arpad Pusztai (below) sparked controversy by publicizing preliminary data suggesting that rats fed transgenic potatoes had stunted growth and suppressed immune systems (*Science*, 19 February, p. 1094). But this week, an anonymous six-member panel convened by Britain's Royal Society concluded that poor experiment design and a host of other problems rendered Pusztai's data—which had not been peer reviewed—"inadequate."

Pusztai is disappointed in the panel's conclusion and says there still "needs to be a scientific debate about testing GM food." And Derek Burke, a former head of the government's Advisory Committee on Novel Foods, says the controversy has "done a great disservice to the GM debate." But whether the panel's findings will help calm the continuing storm over altered foods—which has prompted calls for everything from labeling to import bans—remains to be seen.

Contributors: Michael Balter, Dennis Normile, Govert Schilling, Helen Gavaghan

in U.S. estuaries. But when experts from several dozen agencies began in the last decade to plot a strategy for restoring the Everglades' natural plumbing, they discovered that phosphorus's impact on the ecosystem is dwarfed by the effect of dredging canals and other large-scale physical disruptions of water flow.



The sky's no longer the limit? In new approach to risk, EPA would look beyond single pollutants in Detroit air, for example.

The EPA's tunnel vision in the Everglades is just one example of how the agency sometimes fails to look at the bigger picture when assessing risk, says Mark Harwell, an ecologist at the University of Miami. But that may soon change. Earlier this month, a blue-ribbon panel released a draft report calling on EPA to broaden its outlook by assessing whole suites of chemicals and other threats to health and ecosystems, not just single pollutants. "This really calls for a big change," says Joan Daisey, a physical chemist at Lawrence Berkeley National Laboratory in California and one of 49 members of an EPA Science Advisory Board (SAB) panel that spent 3 years on the report.

In a 1990 report, the SAB urged the agency to set priorities by ranking risks according to scientific reviews rather than mandates from Congress and lawsuits. Laws often focus on single pollutants in specific media, such as air or water, and EPA has tended to hew to the boundaries set by the legislation, despite having leeway to take a broader approach to analyzing risks and crafting policy. Many scientists argue that EPA's ability to improve environmental quality through this pollutant-by-pollutant tack is diminishing, much like a curve nearing an asymptote, says Harwell, a report author.

To help steer the agency toward a more wide-ranging approach to environmental threats while carrying out mandated legislation, EPA Administrator Carol Browner and Congress in 1995 asked SAB to update its risk report. The panel's latest offering, called Integrated Environmental Decision-Making in the 21st Century, has a two-part remedy for EPA. Half the prescription is to probe the breadth of risks to human health—suspected carcinogens and hormone mimics in drinking water, say—or to an ecosystem. The other half is to investigate a "broader range of risk reduction options," which boils down to providing a larger menu for regulators: from strict caps on industrial emissions to guidance on how the public can voluntarily avoid certain risks.

The report lauds a few good models, such as a 1996 law that instructs EPA to assess the health risks of pesticide combinations. New efforts, the report states, could include examining the range of pollutants of particular risk to city dwellers, or helping an industry devise a better strategy for reducing overall risk from its emissions. The report offers EPA a load of suggestions on the finer points of this new direction: The agency should invest more in gathering data on the universe of potential risks and in the social science expertise needed to figure out how best to address them, for example, and work more closely with other agencies on issues that tend to fall between the cracks, such as the threats to ecosystems from tampering with water flows. EPA officials declined to comment on the report, which still must undergo peer review.

The SAB's recommendations are a tall order for an agency still groping for a system with which it would routinely use the best science in setting policy. And the report is no panacea. "It's not as big a step as I think it could have taken," says economist Paul Portney of Resources for the Future, who wanted to see some examples of how EPA might weigh a range of health threats—for example, whether the cheapest way to cut overall risks from air pollution might be to tackle nitrogen oxides rather than particulate matter. But most agree that the report will help to set EPA on a path toward heeding science more regularly. "This is the kind of thing the scientific community has been calling for," says Bailus Walker, a toxicologist at Howard University in Washington, D.C. "It's good to see the SAB is giving it a nudge." –JOCELYN KAISER

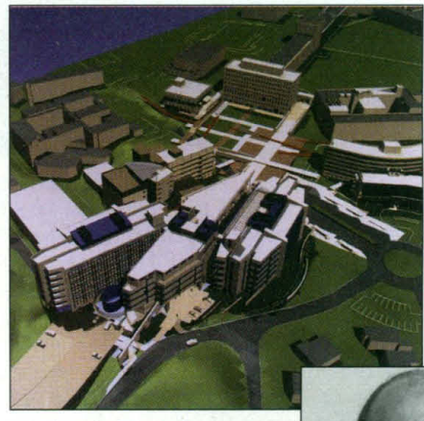
AUSTRALIA

Budget Backs Report On Boosting Biotech

MELBOURNE—With 4 years as research director of California Biotechnology under his belt, Australian molecular biologist John Shine returned home in the late 1980s hoping to apply his knowledge of the burgeoning biotech industry to a start-up company based on the cloning of a key brain neuropeptide receptor. But the company, Pacific Biotechnology, couldn't survive in Australia's notoriously conservative investment climate: Within 3 years it had folded from a shortage of capital, one of several essential steps in a process of turning academic breakthroughs into products.

Last week the Australian government announced a new budget that scientists say signals its desire to change that climate. Its plan to more than double spending on basic medical research over 6 years—to $235 million by 2004–05—mirrors a recommendation last December by a high-level review panel looking at ways to improve the country's competitiveness in health and medical research. In addition to the government's speedy adoption of one of the report's three recommendations, other parts of the budget address its call to strengthen health management. Scientists are optimistic that support for the third leg of the stool—reform of tax laws to encourage venture capitalism—is not far behind. And they give much of the credit to the review panel's chair, businessman Peter Wills, and to Health Minister Michael Wooldridge.

"They are the two big W's," says Shine,



Research bonanza. Peter Wills led a review of Australia's biotech policies that has boosted spending on such activities as genome sequencing at Brisbane's new Institute of Molecular Biosciences.

who is now director of Sydney's prestigious Garvan Institute. "Wills and his committee did an outstanding job of painting a picture of the economic value [of investing in biotechnology], and we had a committed [health] minister. If either one hadn't been there, we would have lost the opportunity."

The review, which Wooldridge commissioned, described the need for a comprehensive strategy to create a robust health-care and biotech industry. It called for boosting the size and duration of grants from the National Health and Medical Research Council (NHMRC), as well as raising salaries and allowing researchers greater mobility. It

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