need of improvement. It recommends that the traditionally independent Max Planck Society forge closer ties to universities and develop research groups that can respond more quickly to rapid new developments in science. In addition, it suggests that universities replace the post–Ph.D. "habilitation" qualification for aspiring professors with something like the U.S.–style "assistant professor" system, and that the DFG restructure its peer-review system and its strategy for promoting new disciplines. Overall, panelists found, the research system tends to be driven by middle managers, such as Max Planck institute directors. "There are great merits in a strong middle, but we'd also like to see a bit more life at the upper and lower levels," says Brook, who directed a Max Planck institute in Stuttgart from 1988 to 1991.

After its yearlong inquiry, the panel concluded that closer cooperation between Max Planck institutes and university researchers might help improve what Brook calls the "mixed reputation" of German universities. Some scientists criticize Germany's university system for being too rigid, especially during the habilitation years. German federal research minister Edelgard Bulmahn, deputy chair of the BLK, has pointed out similar shortcomings. In a recent interview with *Science*, she said she wants to phase out the habilitation—a lengthy process during which postdocs do major projects under the strict supervision of professors—and bolster ties between university and nonuniversity research. Last week, Bulmahn called for "an intensive discussion" of the report's findings.

Brook says the panel found the DFG granting agency to have "a conservative nature" that could be revitalized by revamping aspects of its structure and programs, and perhaps by more actively steering researchers toward areas of research that it deems important. The report suggests a "strategically oriented program" for research grants, as well as a more active approach to funding progressive university programs, such as those supporting the early independence of young scientists. It also recommends opening up the DFG's peer-review system—for example, by including more women and younger researchers as reviewers.

Both the DFG and Max Planck responded swiftly to the report. The DFG's president, biochemist Ernst-Ludwig Winnacker, calls it "a thorough analysis" and says the DFG has already set up new funding programs for independent young scientists and is expanding its roster of peer reviewers. But Winnacker questions the suggestion that the DFG cherry-pick areas of new high-priority research: "The DFG cannot, must not, and should not compete with the federal and state governments, which are extensively involved in research funding that is guided by general political criteria."

In a statement, Max Planck said it was already "well prepared" to implement some of the commission's suggestions, in part because the society is in the midst of an internal reassessment, and also because it has already taken steps to strengthen its connections to universities and to bolster its programs for young researchers. The society plans to establish several "International Max Planck Research Schools" near universities, increasing the number of Ph.D. students who conduct research at its institutes.

Brook says he expects German research to continue to thrive, especially if reforms are embraced: "It's much more difficult to evaluate a high-quality research system, such as Germany's, than a low-quality one."

–ROBERT KOENIG

PHYSICS

Come Fly With Me, Goldin Tells Physicists

BATAVIA, ILLINOIS—Space is the final frontier for particle physics, NASA Administrator Daniel Goldin declared in a 28 May press conference here at the Fermi National Accelerator Laboratory (Fermilab). But Goldin's vision of joining forces with the Department of Energy (DOE) and other agencies in an all-out assault on the mysteries of gravity and high-energy physics failed to uplift some listeners when he labeled Earth-bound accelerators—the focus of DOE's high-energy physics program—a "smokestack approach" to research.

The message of the press conference, which also included representatives from DOE and the National Science Foundation

All aboard. Goldin wants high-energy physicists to propose space experiments.

CREDITS: (TOP) RICHARD THOM/VISUALS UNLIMITED; (BOTTOM) RICK KOZAK

ScienceScope

Experimental Shellfish Mussel Shoals—now known as Muscle Shoals—may once again live up to its name. The U.S. Fish and Wildlife Service (FWS) announced last week that it wants to reintroduce 16 species of endangered shellfish to the 20-kilometer stretch of Alabama's Tennessee River, once known for its dense populations of freshwater mussels.

In the 1930s, pollution and dam construction devastated the shelly shoals. But the river has bounced back, and biologists believe that they could soon begin to restore monkeyface, pigtoed (above), and other mussels. Before replanting can begin, however, the FWS has to reassure some local shellfish harvesters and governments that the protected species won't bring unwanted regulation. To jump that hurdle, the service has proposed calling the returnees "nonessential experimental" populations, a designation that "will avoid lawsuits," says one FWS official. Shellfish friends and foes have until 26 July to comment.

Making Amend(ment)s The battle over a law that requires federally funded scientists to hand over raw data to anyone who files a request has shifted back to Congress. This spring, the White House Office of Management and Budget (OMB) collected more than 8,000 comments on its proposal for implementing the 8-month-old measure, many from scientists worried that it would hinder research by threatening patient confidentiality and proprietary collaborations with companies. In response to that concern, House appropriations committee members James Walsh (R–NY) and David Price (D–NC) plan to offer an amendment to OMB's funding bill that would put a 1-year hold on the law pending a study on its effects.

Business groups are squaring off over the amendment. Supporting the delay are pharmaceutical, biotech, and other firms, including GM and IBM. They are opposed by a legion of oil companies, the U.S. Chamber of Commerce, and small business groups. No use handicapping this contest: "It could go either way," says a Walsh staffer.

If approved by the House and Senate, the amendment—which could be offered as early as next week—wouldn't go into effect until 1 October, after OMB is expected to have issued its final rule.

frayed ends capped with hydroxyl groups. Trying to coax the stable CP-263,114 into a more unstable form proved very difficult. After numerous attempts, the team designed another cascade reaction, which finished the job. When the resulting compound passed muster in a structure-determining nuclear magnetic resonance machine, the climb was complete. Atop the mountain, says Scripps Ph.D. student Phil Baran, "it feels like a 200-ton anvil has lifted off my back."

Yet in some ways the work is just beginning. Now the hunt is on to come up with CP analogs that are more potent and simpler to make. The Scripps team is also launching studies of the detailed biological effects of CPs and their kin. Of course, the search is also on for new molecular mountains to climb.

–ROBERT F. SERVICE

BEHAVIORAL GENETICS

Fickle Mice Highlight Test Problems

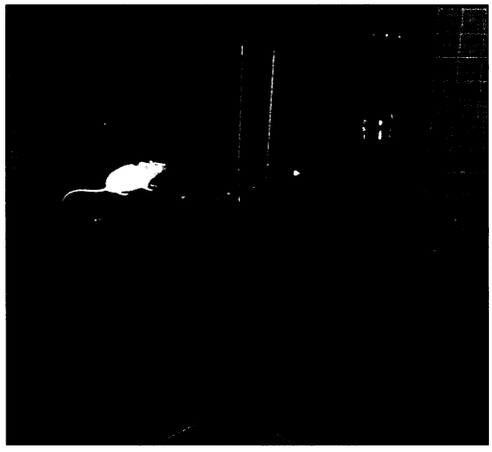
Studying the genetics of behavior is often like riding a roller coaster. A standard way to look for the genetic basis of a behavior—anxiety, say, or aggression—is to knock out a suspect gene in a mouse strain and test the animals in the laboratory. But no sooner has one group of researchers tied a gene to a behavior when along comes the next study, proving that the link is spurious or even that the gene in question has exactly the opposite effect. Now, on page 1670, a study born in part out of frustration over this phenomenon shows how easily such discrepancies may arise.

Behavioral geneticists from three labs across North America applied the same battery of behavioral tests to the same strains of mice, under almost exactly the same circumstances—and yet they often got strikingly different results. This implies that almost undetectable environmental differences may have large behavioral consequences. The finding is bound to complicate efforts to pin down the genetic influences on behavior. "It's the kind of study that needs to be done, but nobody wants to be doing," says behavioral neuroscientist Elizabeth Simpson of the University of British Columbia in Vancouver. "You're looking into something that people would like to believe is not a problem."

The three labs, led by John Crabbe, a behavioral geneticist at the Veterans Affairs' Portland Alcohol Research Center and Oregon Health Sciences University, Douglas Wahlsten of the University of Alberta in Edmonton, Canada, and Bruce Dudek of the State University of New York, Albany, carefully standardized the tests. All three started on 20 April 1998 between 8:30 and 9:00 a.m. local time, and each used a total of 128 77-day-old mice from the same eight strains. Conditions in the three labs, from the light-dark cycle to the brand of mouse feed, were painstakingly equated, to the point of driving the researchers "nuts," says Crabbe. And yet, genetically identical mice often behaved differently, depending on where they were tested.

One puzzling result came from a standard test for anxiety, the so-called "elevated plus-maze." In this test, researchers place a mouse in the center of a big horizontal plus sign fixed about 1 meter above the floor and then measure how much time it spends in each of the four arms, two of which have transparent plastic walls, while the other two are open. Animals that prefer the safety of the walled arms are thought to be anxious, while the ones that venture onto the open arms, nosily peering over the cliffs, are deemed less inhibited. As it turned out, anxiety levels among mice of all strains were lowest in Edmonton. In addition, one strain, in which a receptor for the neurotransmitter molecule serotonin was knocked out, gave different results in all three cities: In Portland, it showed more activity on the maze than controls with intact serotonin receptors; in Albany, it was less active; and in Edmonton, lacking the receptor didn't seem to make any difference.

The same mutant also provided an unpleasant shock for Crabbe. In 1996, his team reported in *Nature Genetics* that the animals drank much more alcohol than control mice having the receptor—a major result, addiction researchers said, because it seemed to firmly nail the importance of the serotonin pathway in addiction. The team had replicated the finding four times. But this time, all three teams found that the animals were no fonder of drink than controls. "It was a bad surprise," says Crabbe, who is



Puzzling plus. Outcomes in the "elevated plus" anxiety test varied from lab to lab.

CREDITS: (TOP TO BOTTOM) RICHARD NOWITZ/PHOTOTAKE/PNI; BRUCE DUDEK/ SUNY

ScienceScope

On the Move The headquarters of a global research collaboration aimed at eradicating malaria in Africa is moving to the National Institutes of Health (NIH) near Washington, D.C. The Multilateral Initiative on Malaria (MIM) will soon arrive at NIH's Fogarty International Center, with British advisors in tow, following an 18-month start-up run at the Wellcome Trust charity in London.

Though the Trust played a key role in launching MIM, it did not want permanent custody of the program, which coordinates a wide range of malaria-related research. The move, announced 26 May, is designed to prevent the effort from becoming firmly "embedded in any organization," says Trust official Catherine Davies. Officials are mum on whether other makeovers will accompany MIM's change of address.

Clear Skies? European radioastronomers have won greater protection from the electromagnetic smog produced by a flotilla of satellites. The European Science Foundation announced this week that Iridium, a company that last year turned on a globe-girdling communications network of 66 spacecraft, will limit interference that is drowning out radio whispers produced by galactic gas clouds.

Last year, Iridium signed similar agreements with U.S. and Indian astronomers, promising to silence its satellites for a few hours each night so that radiotelescopes could tune in to one prized signal (*Science*, 2 October 1998, p. 34). But European astronomers said those pacts didn't go far enough for them. The hard-nosed stance appears to have paid off, with Iridium promising clear skies over Europe about 50% of the time until 2006 under the new agreement. The company has already promised to completely eliminate its smog after 2006.

But interference caused by other satellites could continue to grow worse, says astronomer Jim Cohen of the U.K.'s Jodrell Bank Observatory. He and other researchers are organizing to defend key pieces of the radio spectrum at a May 2000 allocation conference in Geneva, Switzerland.

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