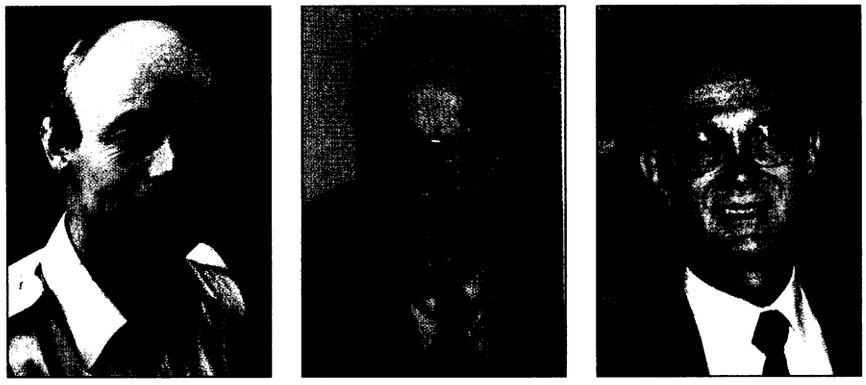
GERMANY

Agencies Tout Reforms, Seek Greater Support

BERLIN—Stung by criticism from an international panel, the leaders of Germany's DFG basic research funding agency and the prestigious Max Planck network of research institutes last week outlined initiatives to make Germany's research system more flexible, better coordinated, and more open to fresh ideas and top researchers from abroad. The reforms also include plans for closer relations between Max Planck researchers and their university counterparts and increasing diversity among DFG peer reviewers. But DFG president Ernst-Ludwig Winnacker and Max Planck president Hubert Markl say that they can only do so much: The German government, they argue, must do its part by easing federal regulations and boosting spending.



With one voice. Teamwork and flexibility are the hallmarks of proposed reforms by, from left, Helmholtz's Ganten, DFG's Winnacker, and Max Planck's Markl.

The Max Planck and DFG initiatives, announced at an unprecedented joint press conference here, follow a separate move last month by the Helmholtz Association, which represents the country's 16 federally funded national research centers, to centralize some decision-making and foster work in six interdisciplinary areas. All three research organizations are responding in part to outside pressure. The Max Planck and DFG initiatives follow a report in May by an international evaluation commission that criticized the quality of German university research, branded the DFG as stodgy, and urged Max Planck to move more swiftly into new research areas (*Science*, 4 June, p. 1595). Helmholtz was recently jolted by the government's decision to shift one of its centers to the Fraunhofer applied science network, with hints of further changes. Together, the actions of these major research players signal an openness to reform as the country heads into the new millennium. "We want to become more flexible in pursuing fresh new research fields, more cooperative in our work with universities, and more attractive to top international scientists," Markl told *Science*.

At Max Planck, the strengthening of a research planning panel and reforming the way institutes are evaluated should allow it to move more swiftly into new fields. Chagrined by the recent loss of three top scientists to international competitors, Markl also intends to strengthen overseas recruitment efforts. This summer Max Planck will make its first real foray into education by opening several international research schools that will offer advanced scientific degrees in tandem with German universities. Markl is also preparing to launch a program to create interdisciplinary teams from several institutes, starting with three projects in such areas as mixed-phase catalysts for fuel cells and materials analysis.

Winnacker would like to open up the DFG's peer-review system to more women and younger scientists by wrestling some control over appointments from Germany's scientific societies. In an effort to make the system more transparent, DFG will soon publish a first-ever list of its approximately 5000 outside reviewers. It also plans to attract foreign scientists by supporting focused research programs at several universities.

The reforms deviate somewhat from the recipe laid out last spring by the international panel, led by materials scientist Richard Brook, chief of Britain's Engineering and Physical Sciences Research Council. For example, Winnacker rejected the group's suggestion that the DFG use more of a "top-down" approach in setting research priorities for its university grantees. Such directed research, he says, should be limited to nascent fields such as bioinformatics. Markl and Winnacker also noted that the reforms need to be combined with larger changes to the research enterprise. "It's difficult to make reforms when you are handcuffed by overregulation and limited by a lack of funds," said Winnacker, noting that Germany is falling behind the United States and Japan in the share of its economy devoted to research.

Although she has not responded directly to their challenge, federal Research Minister Edelgard Bulmahn has expressed support for reforming employment practices and has pledged to lobby for increased spending after the current round of budget cutting ends in 2003. "We plan to relieve research institutions and universities from some of these bureaucratic restrictions and strengthen their independence," she said in a statement. An expert panel that includes Winnacker will begin a study early next year on how to solve such bureaucratic problems.

Some changes already are under way. At a recent meeting, Helmholtz president Detlev Ganten, who directs the Max Delbrück Center for Molecular Medicine, and the Helmholtz oversight board were given more power "to improve the coordination of research" among its facilities, which are intended to meet national needs. Although the six strategic areas cover such broad topics as the "structure of matter and basic physics" and "health research and life sciences," Ganten says that the government has made it clear that "no center can do just what it wants to do anymore." This spring the science council will conduct a systematic evaluation of Helmholtz and its centers, which range from Hamburg's DESY synchrotron to Potsdam's research in geosciences. Ganten predicts that the review "will lead to significant changes" in the association and its components.

–ROBERT KOENIG

ASTRONOMY

New Tragedy Hits French Observatory

Disaster has struck the Institute of Millimetric Radioastronomy (IRAM) in France for the second time this year. On 15 December, a helicopter en route to the mountain observatory crashed, killing at least three people on board. The passengers—one IRAM technician and three employees of a subcontractor—and the pilot were on a service mission to the observatory, which sits atop the 2552-meter Bure plateau in the French Alps. "We are still entirely in shock," says IRAM astronomer Michel Bremer.

In July, a cable car servicing the observatory came loose from its cable, plummeting 80 meters to the ground and sending 20 IRAM staff and subcontractor employees to their deaths (*Science*, 9 July, p. 181). It's not clear what caused last week's crash.

The observatory, which is currently accessible only by helicopter because of wintry conditions, has been operated by a small crew since the July accident, says Bremer. Run jointly by the French basic research agency CNRS, Germany's Max Planck So-

CREDITS: (LEFT TO RIGHT) GANTEN; DFG; R. STONE

ciety, and Spain's National Geographical Institute, the observatory is in the process of being linked to a 30-meter telescope at Pico Veleta in southern Spain; together, they will form a so-called very large baseline millimeter array, a virtual telescope the size of the distance between the two observatories. The accident is expected to slow completion of this effort even further, Bremer says.

–ALEXANDER HELLEMANS

Alexander Hellemans writes from Naples, Italy.

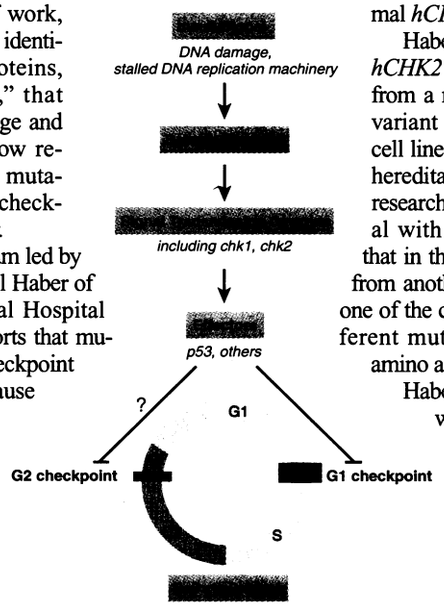
HUMAN GENETICS

Checkpoint Gene Linked To Human Cancer

As any driver knows, reliable brakes are every bit as important to safety as the gas pedal. The same can be said about cells when it comes to dividing. They have to know when to stop, say, when their chromosomes have been damaged, because if they don't the resulting mutations may propel them down the road to cancer. Over the past several years, a great deal of work, much of it in yeast, has identified a network of proteins, called "checkpoints," that helps cells sense damage and put on the brakes. Now researchers have linked mutations in one of these checkpoint proteins to cancer.

On page 2528, a team led by cancer geneticist Daniel Haber of Massachusetts General Hospital (MGH) in Boston reports that mutations in a known checkpoint gene called *hCHK2* cause some cases of Li-Fraumeni syndrome (LFS), a hereditary cancer susceptibility that leaves its patients prone to developing any of several cancers, including breast and brain cancers and certain leukemias. This is not the first gene linked to LFS. In 1990, Stephen Friend's team, also at MGH, found that inherited mutations in the well-known tumor suppressor gene *p53* can cause the condition. Subsequent work showed that *p53* mutations account for only about 75% of the cases, however. The new work provides an explanation for some, although not all, of the remaining LFS cases. And even though the number of LFS patients may be small—only about 200 families worldwide have been reported—the discovery of *hCHK2* and additional LFS defects in the future may "help [us] to understand the molecular mechanisms of tumorigenesis" reaching far beyond LFS, says Friend, who is now at the Fred Hutchinson Cancer Research Center in Seattle, Washington.

The finger of suspicion already pointed at cell checkpoints as being important. Indeed, the p53 protein itself halts cell division in response to chromosomal damage. So Haber and his team studied several members of four LFS families that did not have *p53* mutations, looking for mutations in the human counterparts of genes previously identified in yeast as playing a major role in checkpoint control. Most such genes turned up as perfectly normal. But in one family, three LFS patients had identical mutations in one copy of the gene encoding chk2, a kinase enzyme that passes on the stop signal in damaged yeast cells by attaching phosphate tags to other proteins. The protein produced by the mutated gene would be unable to perform this function, Haber says, because part of it, including its enzymatic center, is missing. A healthy relative, in contrast, had a normal *hCHK2* gene.



Genetic quality control. Cells have "checkpoint" pathways that sense chromosomal damage and stop cells from dividing to allow time for repair. Mutations in checkpoint components, such as *p53* and *chk2*, can pave the way to cancer.

Haber's team next looked at *hCHK2* in 18 patients suffering from a related syndrome called variant LFS and in 49 cancer cell lines from a variety of nonhereditary human tumors. The researchers found one individual with a mutation similar to that in the first family. The gene from another individual and from one of the cancer cell lines had different mutations, changing one amino acid to another. Although Haber doesn't know for sure whether these "spelling errors" debilitate the kinase, he notes that his team failed to detect them in the gene from 50 healthy control individuals. "This suggests that these alterations are not simple sequence variants that are prevalent in the general population," says Haber.

The results are likely to receive a warm welcome in the cancer community. "This is great. People have been searching for mutations to explain LFS [in families with intact *p53*] for almost a decade and [have] found absolutely nothing," says Friend. But he adds that, because *hCHK2* mutations turned up in only one of the four families studied, "there is a good likelihood that [other LFS families] will have mutations in other interesting genes." Paul Russell, a yeast cell cycle expert

CREDITS: (LEFT TO RIGHT) BELL *ET AL.*/VERITAS

ScienceScope

Star-Crossed? The U.S. Forest Service has decided to take another look at a controversial plan to build the world's largest array of ground-based gamma ray telescopes near a Native American sweat lodge at the base of Arizona's Mount Hopkins.

In September, the agency rejected a request from astronomers at the Smithsonian Institution in Washington, D.C., for a permit to build the $16.6 million, seven-reflector array on public land (*Science*, 10 September, p. 1650). It said then that the 4-hectare site, which is less than 1000 meters from a multitribe steam hut, conflicted with "Indian religious practices." But at the Forest Service's invitation, the Smithsonian submitted a new plan last week.

The revised proposal uses the same site, says Trevor Weekes, principal investigator for the Whipple Observatory project, but moves the access road farther from the sweat lodge and sets the dishes closer to the ground. But those changes don't satisfy Native American groups, who object to the presence of any scientific facility so close to the sweat lodge. "[The Smithsonian] can't take no for an answer," says sweat lodge operator Cayce Boone, a Navajo, who feels "betrayed" by the Forest Service for keeping the issue alive.

In the Wind The American Meteorological Society has decided to do something about the weather—or at least what it claims is the government's relative inattention to atmospheric policy. The society has put up $400,000 to address the problem and has recruited two prominent National Science Foundation officials—former atmospheric division director Richard Greenfield and outgoing geosciences chief Robert Corell—to lead the effort from its Washington, D.C., office.

The Atmospheric Policy Program represents a "considerable investment" for the 12,000-member Boston-based organization, says executive director Ronald McPherson. The idea, he says, is to self-fund a few studies on hot topics—such as the growing commercialization of weather data—then persuade agencies and other funders to pick up the tab for future activities. Although the program won't lobby the government on legislation, Greenfield says he hopes to provide graduate students and professionals with a better understanding of atmospheric research. "I can't name anybody at the top levels of government with a strong background in atmospheric sciences," McPherson says.