search Centre and with scientific agencies in E.U. member nations.

Some European scientists are welcoming the recommendations, but others complain that the new authority would lack teeth: With no direct power to inspect suspect food shipments, punish violators of European food laws, or dictate policy to E.U. member nations, it would have nowhere near the clout of the U.S. Food and Drug Administration (FDA). Some are also disappointed that the proposed organization would play no role in public health policy. The E.U. has a drug-analysis lab—the European Medicines Evaluation Agency in London—but has no equivalent to either the FDA or the U.S. Centers for Disease Control and Prevention.

As public debate on food safety has raged over the past several years, the commission has struggled to beef up its authority. In 1997, the commission sought to insulate its scientific advisory panels on food safety from outside pressures—especially from industry—by moving them to the consumer directorate. But that shift solved only some of the problems, says physiologist Philip James, director of the Public Health Policy Group, a U.K. think tank, and a member of the commission's Scientific Steering Committee—an independent advisory panel that deals with multidisciplinary issues related to public health. "The commission's demands on scientists have at times been ridiculous, the remuneration for scientists has been too low, and the size of the 'scientific secretariat' support staff has been ludicrously small," he says. Indeed, the white paper itself says "The existing [scientific advice] system is handicapped by a lack of capacity, and has struggled to cope with the increase in the demands placed on it."

James and two other members of the steering panel—German toxicologist Fritz Kemper and French food safety expert Girard Pascal—last month issued a 74-page report criticizing the scientific advisory structure and suggesting the creation of a wider European authority that would cover both food safety and public health. They argued that the European public's confidence in scientific and government analyses "has declined because of a perceived bias toward political and industrial rather than consumer interests." Says Kemper, a Münster University professor who was a key player in developing the 1997 reforms: "We have to restore the confidence of European consumers, which was badly damaged by the BSE and other food safety debates." The new proposals are "a step toward improving the commission's scientific advice system on food safety—but it is only an initial step," says James. "Ideally, we would have a powerful agency like the FDA, but in Europe we have to do things one step at a time," adds Kemper.

But even this first step may be difficult. The European Parliament gave an initially tepid response to the white paper's proposals, and some consumer and food industry groups criticized the plan. David Barling, a researcher at the Centre for Food Policy in London, sees possible tension between the new E.U. Food Authority and the national food agencies that operate in eight of the 15 E.U. member nations. "There are some obvious fault lines," he says, including "the potential for future conflict when you create a European Food Authority at the same time that national food safety agencies are emerging."

–ROBERT KOENIG

EUROPEAN UNION

Getting Researchers to Pull Together

Like a fragmented empire of powerful fiefdoms, research in the European Union (E.U.) tends to be driven by the policies and leading laboratories of its 15 member nations rather than by any overarching vision across the whole community. Although that landscape is unlikely to change significantly anytime soon, the E.U.'s new research commissioner, Philippe Busquin, this week proposed steps to make the borders on the map of European research a bit less distinct.

Decrying the "fragmentation, isolation, and compartmentalization of national research efforts" in Europe, Busquin delivered a white paper policy statement on 18 January that outlined his concept for a "European Research Area." "There is no real research policy in Europe now, and the coordination of the member states' national policies and the European Commission is insufficient," says Busquin. "The research effort is often too little, too late, and too much centered on the national context—especially in comparison with our main competitors, the U.S. and Japan."

Cohesion needed. Philippe Busquin.

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A significant part of Busquin's plan is the creation of a new "council of high representatives" from pan-European research centers such as the CERN particle physics lab, the European Molecular Biology Laboratory (EMBL), the European Space Agency, and the European Southern Observatory. These and other centers have a major influence on European research, but are run in-

ScienceScope

Booster Shot The Korea-based International Vaccine Institute (IVI) has received a 5-year, $40 million grant from The Bill and Melinda Gates Foundation to introduce vaccines for cholera, dysentery, and typhoid in six Asian countries. The money—for studies on topics such as disease prevalence and better vaccine delivery—is aimed at convincing policy-makers in the developing world that vaccines are a cost-effective way to improve public health.

"While the grant is large, it's small in terms of the job we face," says John Clemens, director of the 3-year-old IVI, which carries out collaborations with U.S. and European researchers and is building labs at Seoul National University. Focusing on Bangladesh, China, India, Indonesia, Thailand, and Vietnam, the money targets diseases that kill nearly 2 million people worldwide every year.

Mir's Nine Lives Slated to have been junked in the Pacific this year, the former pride of the Soviet Union is about to get a new lease on life as the loftiest outpost of capitalism. A Bermuda-based company called Mir Corp. Ltd. has raised some $20 million (primarily from telecom tycoon Walter Anderson) to renovate the creaking space station and plans to make a buck by selling time and space aboard what CEO Jeffrey Manber calls "one of the world's great destinations." He envisions that advertising and maybe even some research will keep the station afloat. Mir Corp. will be under majority control of RKK Energia, the firm that builds much of Russia's space hardware.

Try, Try Again As scientists duke it out over the safety of genetically modified (GM) organisms, nations have reached a frustrating impasse on crafting trade rules. Signatories to the 1992 biodiversity treaty agreed to address the environmental impact of certain GM products. After hammering away for 8 years at a new treaty on the export of GM products, negotiators will pick up the beat again next week in Montreal.

Major ag exporters, including the United States, argue that any treaty on segregating and labeling GM crops should apply only to seeds or organisms that could escape into the wild. However, delegates from Europe—where passions over GM foods have flared (*Science*, 7 August 1998, p. 768)—plan to lobby for broader language that would give countries the right to ban products even in the absence of strong scientific evidence that they are unsafe. Don't count on any compromises just yet.

dependently by different groups of countries, not by the E.U. Busquin's idea is to get them working together, discussing funding sources, international cooperation, and access for non-E.U. scientists.

Initial reaction to this proposal has been positive. "A substantive council that could identify and follow up opportunities for cooperation with the E.U. and among the centers would certainly contribute to the dynamism of European science," says EMBL director-general Fotis C. Kafatos. Although the centers focus on widely differing fields, Kafatos says he foresees "the possibility of fruitful collaborations ... for example in informatics, in modeling complex systems, and in engineering tasks."

The council is the most visible of several proposals Busquin included in his white paper. He also wants to commission a "benchmarking" study of research efforts in all E.U. nations; find ways to network the best European research centers into "virtual centers of excellence"; help to create an "E.U. patent" that would be simpler and cheaper than the current European patent; encourage national research centers to give technical support to start-up companies; and attract outside researchers to work in the E.U. Busquin's vision also includes a "thorough rethink" of plans for the E.U.'s next flagship research program, Framework 6, focusing more on areas that should be tackled at a Europe-wide level. The current framework funds a large number of crossborder projects in many fields, but accounts for only about 5% of public research expenditure in Europe.

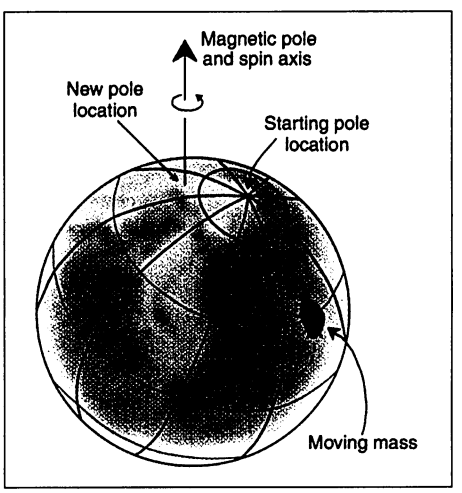
Busquin is hoping his white paper will spark a 6-month debate in European labs and the European Parliament over the best way to make E.U. research more cohesive. He must win the support of both the European Parliament and E.U. member governments to implement many of his proposals, but he aims to ask research ministers to endorse the plan in June. –ROBERT KOENIG

GEOPHYSICS

Did the Dinosaurs Live On a Topsy-Turvy Earth?

Earth's surface is constantly on the move. Over tens of millions of years, the drift of continents carries land from tropics to poles, from poles to temperate latitudes. But another agent of change may be at work beneath our feet, occasionally jerking not just a continent but the whole globe into new climate zones. On page 455 of this issue of *Science*, two researchers report evidence that 84 million years ago the whole Earth rolled like a ball, turning 15° to 20° in a couple of million years. That would be enough to rotate Washington, D.C., into the tropical latitudes of the Caribbean today. To paleoclimatologists, such a rapid whole-Earth tumble would trigger climate shifts that seem to have come out of nowhere. This "true polar wander," so called because the geographic poles could actually travel across the globe, would move land and sea 10 times faster than continental drift ever has. And it may be symptomatic of unusual turmoil within the deep interior of Earth.

Earth's poles are a wobbly crew, as scientists have long known. The magnetic poles ramble around a bit with the vagaries of the churning core that produces the magnetic field. Averaged over tens of thousands of years, though, they stick close to the geographic poles marked by the spin axis, which wobbles predictably while remaining fixedly pointing to the same stars. But despite all this wandering, experts have disagreed for decades about whether the geographic poles ever rapidly shifted their position. "Virtually every test we've done in the past 5 years suggests true polar wander has been overestimated," says paleomagnetician John Tarduno of the University of Rochester, New York. But paleomagnetician Richard Gordon of Rice University sees something like the 84-million-year event in his own data.



Try, try again. Intending to crawl from equator to pole, a bug sees the pole wander away as Earth tumbles to keep the bug's mass at the equator.

The principles of true polar wander have been straightforward enough since physicist Peter Goldreich of the California Institute of Technology and mathematician Alar Toomre of the Massachusetts Institute of Technology applied some basic physics to the problem in 1969. A spinning Earth is most stable when its most massive parts, such as an ice sheet on its surface or a lump of particularly dense rock within it, are farthest from its spin axis as marked by the poles—that is, when the extra mass is at the equator. If the mass forms or moves elsewhere, Earth will roll to bring it to the equator, while the spin axis remains pointing at the same stars. In a classic figure (see above), Goldreich and Toomre likened the excess mass to an oversized bug heading from the equator to the pole. If it walks too slowly, the pole will wander away from it, keeping the bug forever near the equator.

The physics worked, but it fell to paleomagneticians to show whether true polar wander has ever happened. They got the nod because they can track ancient magnetic poles, which coincide with the spin axis poles in the long run. The magnetic field is frozen into rocks as they solidify from lavas, recording the pole location. Paleomagnetician William Sager of Texas A&M University in College Station and geochronologist Anthony Koppers of Scripps Institution of Oceanography in La Jolla, California, have compiled 27 ancient pole locations dated to between 120 million and 39 million years ago by radiometric argon-argon dating. They assumed that each of the Pacific Ocean seamounts—mountain-sized piles of lava—had locked in a single magnetic field whose orientation points to the pole's location at the time the lava solidified.

After weeding out the lower quality or undated pole positions, Sager and Koppers found an odd situation about 84 million years ago. Seamounts from that period, give or take 2 million years, yield two pole locations 16° to 20° apart. Plate tectonics couldn't have operated quickly enough to shift the poles that far in the few million years allowed, says Sager: "It looks like there was a rapid polar shift 84 million years ago." By their analysis, the area of the Atlantic Ocean would have moved as fast as 110 centimeters per year southward compared to the top speeds of plate tectonics today of 10 centimeters per year.

Not everyone finds the data convincing. Sager and Koppers "call it true polar wander," says paleomagnetician Dennis Kent of Lamont-Doherty Earth Observatory in Palisades, New York, "but maybe it's something else. Maybe it's bad data." "I think they underestimated the effect of data selection," adds Tarduno: In Sager and Koppers's study, the 84-million-year event is defined by just four poles, he notes.

Gordon, on the other hand, thinks something unusual happened in the Pacific around 84 million years ago. He also sees a large, although less abrupt, polar shift about that time in Pacific paleomagnetic data of a different sort: paleopoles derived from the magnetic field locked into long stripes of Pacific Ocean crust. For complete confidence, true polar wander should appear worldwide, by definition. However, the shift is far less obvious in paleopoles determined

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