der analysis, which may have been as brief as a statement that there were no significant sex differences. That share remained constant over the period, Vidaver adds.

NIH's Pinn says that the analysis is premature, because the studies would have been funded before the 1993 law was implemented. But Greenberger counters that the NIH began urging the inclusion of women starting in 1986, adding that "we thought at least we'd see a trend" toward more gender analyses.

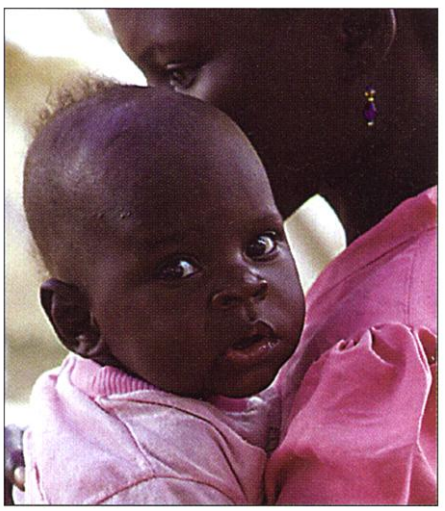
The society isn't waiting for NIH to make things happen. On 25 May, it wrote to the editors of 32 leading journals, calling on them to revise publication guidelines to require a sex analysis. **–LAURA HELMUTH**

VACCINE DEVELOPMENT

Radical Steps Urged to Help Underserved

BETHESDA, MARYLAND—These are miraculous times for researchers working on vaccines for the world's major scourges. For years, their plea for more funding, political attention, and greater involvement from the pharmaceutical industry fell on deaf ears. But recently, their cause has been embraced by politicians around the world—indeed, President Clinton seems determined to make it part of his legacy—and industry leaders have promised to do what they can. Suddenly, anything seems possible.

So when a broad group of researchers, big-pharma CEOs, and public health experts met last week at Clinton's request to discuss the main obstacles on the road to new vaccines for AIDS, malaria, and tuberculosis,* meeting organizers urged them to think big. "Now is your chance, folks!" beamed Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases (NIAID), who said the ideas would help shape the Administration's future policy. The participants were happy to comply, with proposals that range from a 10- or 20-fold budget increase to a new, more flexible funding agency to circumvent the National Institutes of Health's (NIH's) bureaucracy. A few even proposed a crash effort akin to the Apollo program that put a man on the moon within a decade.



CREDIT: AP PHOTO/T. HADEBE

Unmet need. Malaria kills a million people a year, mostly in Africa, but no vaccine exists. Momentum is building to change that.

Epidemiologists say vaccines are the only practical way to cut the death toll from AIDS (currently estimated at 2.6 million annually), TB (which kills 1.5 million to 2 million), and malaria (more than a million). Doing so would also be a boon for development, economists point out: In Africa, especially, sickness and death take a huge toll on the economy.

Yet funding for most types of vaccine research has been hard to come by because the big killers overwhelmingly afflict the developing world. NIH currently spends a paltry $6.5 million a year to find a vaccine for TB and $25 million for malaria. (Vaccine studies for AIDS, which poses more of a threat to the U.S. population, will get an estimated $250 million this year.) Pharmaceutical companies have been reluctant to bet much of their R&D budgets on these vaccines, as expected returns are low, and developing countries don't always respect industry patents. For the same reasons, cash-starved small biotech companies have a hard time attracting venture capital.

To help break the pattern, Clinton proposed a Millennium Vaccine Initiative in January, which includes increased funding for NIH, a $50 million contribution to the Global Alliance for Vaccines and Immunization, and a $1 billion tax break on vaccine sales to stimulate industry investments. Several bills before Congress would do more or less the same, and some European countries are considering similar steps. The issue will also be on the agenda when leaders of the eight major industrial nations meet next month in Okinawa, Japan.

Not all of the proposals to come out of the NIH meeting, however, are likely to make it onto the table, at least in their current form. The malaria researchers, for instance, want the president to initiate an "aggressive malaria vaccine program" and raise funding to $500 million a year. The group also thinks the U.S. should agree to purchase $500 million a year worth of vaccines, if one gets developed, to guarantee that there is a market. The AIDS group pleaded for a 10-fold funding hike for vaccine studies in general, while the TB researchers suggested setting up something

* Vaccines for HIV/AIDS, Malaria and Tuberculosis: Addressing the Presidential Challenge, 22 to 23 May, at NIH.

ScienceScope

Vaccine Variation The National Institutes of Health (NIH) is restructuring its HIV vaccine research in a move designed to spark flagging efforts to combat the global AIDS epidemic. The agency recently abandoned its current two-pronged approach, which used separate networks of academic and clinical centers to run early-stage domestic and late-stage international vaccine trials. In its place, NIH is forming a single HIV Vaccine Trials Network, a system of nine U.S. academic centers. Most will be paired with clinics in countries suffering the brunt of AIDS deaths.

The shift is a response to criticism that the existing networks—the U.S.-based AIDS Vaccine Evaluation Group and the international HIV Network for Prevention Trials—lacked coordination. Critics also argued that scientific priorities were being set by NIH bureaucrats, not researchers. The new approach will move much of the administrative control and priority setting to a Core Operations Center run by Lawrence Corey of the Fred Hutchinson Cancer Research Center in Seattle, Washington.

The makeover isn't a sure bet to succeed, says Mark Mulligan, who runs one of the new network's centers at the University of Alabama, Birmingham. But, he adds, "when there's not success, the structure gets changed to try to stimulate some new vitality."

Family Quarrel Energy Secretary Bill Richardson moved quickly last week to break up an internal fight over the future of the world's largest laser. While publicly supportive of the National Ignition Facility (NIF) being built at California's Lawrence Livermore National Laboratory, some officials at New Mexico's Sandia and Los Alamos national laboratories have long privately attacked the project as ill conceived. And recent news that NIF is $1 billion over budget (*Science*, 5 May, p. 782) has only added to fears that Livermore may eat into its sister labs' budgets.

To prevent that, Sandia vice president Tom Hunter told the *Albuquerque Tribune* on 25 May that NIF should be downsized so that it will not "disrupt the investment needed" at the other labs. But Hunter's statement was "out of line," "the type of lab divisiveness which is extremely unhelpful," and "will be totally disregarded," Richardson promised in a statement. The discord, however, may raise questions in Congress, which will vote on NIF's budget later this year.

Contributors: David Malakoff, Jocelyn Kaiser, Robert F. Service

akin to the Defense Advanced Research Projects Agency—which prides itself on attracting daring ideas and funding them swiftly—and endowing it with $3 billion. "We need out-of-the-box thinking," says Barry Bloom, dean of the Harvard School of Public Health in Boston.

The meeting ended without a set of recommendations, but NIAID's Fauci says his institute will write a summary and pass it on to Health and Human Services Secretary Donna Shalala. Most participants, like Malegapuru Makgoba, president of the Medical Research Council of South Africa, were optimistic that tangible results are within reach: "I'm confident that we'll see an AIDS vaccine in the next 5 or 6 years."

But the lack of clear-cut plans on how to proceed left some a tad disappointed. "We shouldn't continue to have these very general meetings, where a shopping list is read out," says Richard Feachem, director of the Institute for Global Health in San Francisco and a veteran of similar gatherings, some with the same cast, over the past year. "This is a very special time," he asserts. "There's an energy now that we need to harness quickly, because it might be lost." **–MARTIN ENSERINK**

QUANTUM PHYSICS

Furtive Glances Trigger Radioactive Decay

Quantum physicists love to shatter conventional wisdom—even their own. Take radioactive decay. Common sense says you can't keep an atom's nucleus from decaying simply by looking at it. Quantum mechanics says you can. Now two Israeli physicists have come up with a way in which watching a nucleus might make it decay *faster*.

The decay-preventing process, known as the quantum Zeno effect, has fascinated physicists for 25 years. It takes its name from the paradox-mongering Greek philosopher who imagined himself repeatedly interrupting an arrow's flight to chop its trajectory into smaller and smaller bits—thus proving (he thought) that motion was impossible.

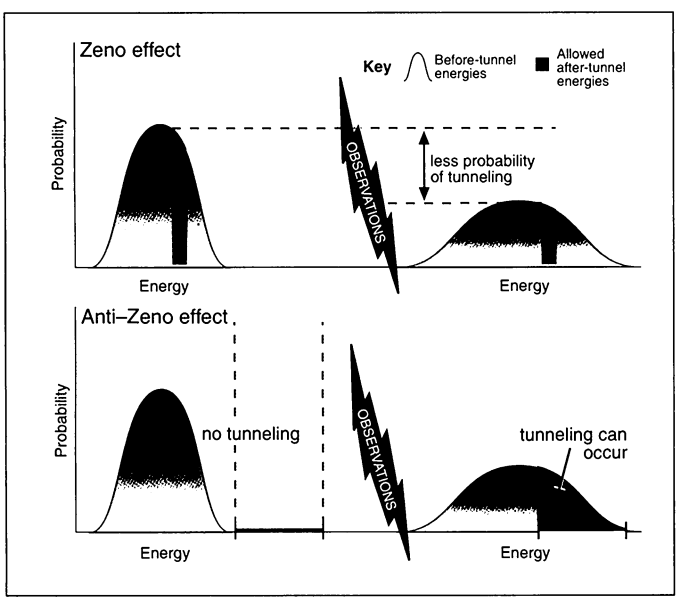
In the quantum case, what is ruined by interruption is not motion but processes such as nuclear decay. Imagine an alpha particle, two protons and two neutrons, lodged inside a much larger, radioactive nucleus. The particle is there because it can't hurdle the nuclear "energy barrier" that holds it in. Sooner or later, though, the particle probably *will* escape, causing the nucleus to decay. It can do that by tunneling through the barrier, in a strange quantum way. At first, the particle is firmly stuck on one side of the barrier, but as time goes on, it "spreads out" and starts to exist in a "superposition" of bound and free states that puts it, in effect, on both sides of the barrier at the same time. From this superposed state, the particle may decide that it is on the far side of the barrier, break free, and escape.

But there's a twist. If someone observes the particle, by, say, bouncing a photon off it, whatever superposition there is "collapses," and the particle must instantly decide which state it is in—inside or outside the barrier. "You make your measurement and, bingo! You're in one and only one state," explains Peter Milonni, a physicist at Los Alamos National Laboratory in New Mexico. By repeatedly measuring and prodding the particle, a scientist can keep destroying the superposition before it gets established, drastically reducing or even eliminating the possibility that the particle will tunnel through the barrier. "The exponential decay process could be slowed down or completely interrupted by the Zeno effect," says Gershon Kurizki of the Weizmann Institute of Science in Rehovot, Israel. In short, the watched pot never boils. Physicists think they've seen this quantum Zeno effect in experiments with photons and with trapped ions.

Now Kurizki and his colleague Abraham Kofman argue in this week's issue of *Nature* that the reverse can happen: Under certain conditions, the watched pot *always* boils. Kurizki and Kofman think of the Zeno effect as an interaction of overlapping energy states. Before tunneling, a particle can take on a certain range of energies; after tunneling, it has another range. A particle can tunnel only if those energy ranges overlap. Energy ranges, however, can change. If you knock a particle by measuring it, for example, the jolt from the photon broadens the range of energies the particle can take on. The faster you repeatedly measure the particle, the broader the range gets. With more energy options to choose from, the particle spends less time in any particular part of its range. Thus, by repeatedly observing a before-tunneling particle, physicists can ensure that it spends almost all its time at energies that don't overlap with after-tunneling energies. The result: no tunneling, and no nuclear decay.

Kurizki and Kofman realized that the exact opposite can happen. Suppose, they said, your before-tunneling energies and after-tunneling energies don't overlap to begin with. In that case, the particle can't escape. But repeated measurements might broaden the range of before-tunneling energies so that it creeps into the after-tunneling zone, allowing the nucleus to decay. "If you do it sufficiently fast, you would see an increase of the decay rate," Kurizki says. "The same procedure leads to the opposite of what is expected."

Although nobody has yet seen the anti–Zeno effect in action, Kurizki believes experiments will verify it within a few years. In fact, he thinks the anti–Zeno effect ought to be much more common than the Zeno effect—"the rule rather than the exception." If so, that could be bad news for scientists trying to develop quantum computers. Some physicists have proposed using the Zeno effect to keep quantum bits from losing the information they contain. But a repeated measurement might induce an anti–Zeno effect instead, Kurizki says. "It might have the opposite effect." **–CHARLES SEIFE**



Zeno phobia. By spreading out a particle's energy curve, observations can make it either less (top) or more likely to escape by quantum tunneling.

NSF REAUTHORIZATION

Closed Ethics Case Sparks Dueling Bills

A 2-year-old case of financial impropriety by a former National Science Foundation (NSF) senior staffer has exploded like a time bomb on Capitol Hill, sending the agency running for cover. The surprise battleground is new legislation to reauthorize NSF's programs, a process normally carried out with little fanfare. The dispute pits the chair of the House Science Committee, James Sensenbrenner (R–WI), against Nick Smith (R–MI), chair of the panel's basic research subcommittee. Caught in the crossfire is NSF Director Rita