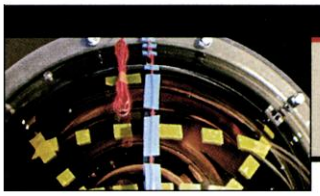
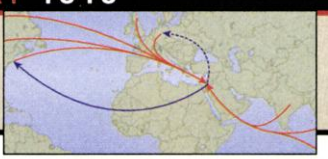
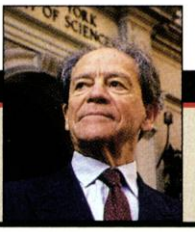


1815
Making a case for neutrino detection

LEAD STORY 1818
Israel leads the way on stem cells





1824
An academy on the ropes

cists who are also at Oak Ridge. Late in May, after the lab had given Taleyarkhan and colleagues the go-ahead to submit their results to *Science*, Lee Riedinger, the lab's deputy director for science and technology, asked Shapira and Saltmarsh to check the work with a more sensitive neutron detector.

Deuterated duo. Rusi Taleyarkhan (*left*) and Richard Lahey hope others will soon repeat their experiment.

They concluded that Taleyarkhan's results had been an illusion.

"There's no evidence for any neutron excess due to fusion," Saltmarsh says. "If the tritium results in Taleyarkhan's paper are correct, and if you assume all the tritium is due to d-d fusion, then you expect a 10-fold increase in the neutron signal. We see a 1% effect." One possibility is that the extra neutrons are left over from the 14-MeV neutrons fired into the cylinder, eventually winding up in the detector after skittering about the room. To rule out that scenario, says Saltmarsh, he and Shapira timed the flashes of light from the bubbles and compared them with the arrival times of the extra neutrons. The effect disappeared. "We didn't see any evidence for a coincidence between neutrons, gamma rays, and light emissions above background," Saltmarsh says.

Taleyarkhan and colleagues dispute Saltmarsh's interpretation of the data and are posting the details of their objections on the Web. Riedinger characterizes the ongoing dispute as "an active dialogue about what could be wrong with either set of measurements." At the same time, he compliments Taleyarkhan's abilities and calls the work "very novel and interesting."

Sharper comments began to pepper *Science*'s editors as Taleyarkhan's paper neared publication. Don Kennedy, the editor-in-chief of *Science*, says that Oak Ridge officials tried to withdraw their permission to publish the paper. "There was certainly pressure from Oak Ridge to delay, if not to kill, the paper," says Kennedy. "I'm annoyed at the intervention, and I'm annoyed at the assumptions that nonauthors had the authority to tell us we couldn't publish the paper."

As knowledge of the pending paper spread, scientists outside Oak Ridge joined the fray. Late in February, physicist William Happer of Princeton University and Richard Garwin of IBM's Thomas J. Watson laboratory in Yorktown Heights, New York, each wrote Kennedy a letter about the paper. They say they were simply encouraging *Science* to publish the Shapira and Saltmarsh data as well, or at least not to hype the paper.

"I like *Science*," Happer says. "I'm a member of AAAS, and I don't want them to shoot themselves in the foot—or some other body part. All I told [Kennedy] was, for God's sake, don't put it on the cover." Happer, who headed the Department of Energy's science office for 2 years in the early 1990s, adds that he is also trying to save the scientific community from another embarrassing fiasco. "I saw it happen with cold fusion. If we're really unlucky, Dan Rather will talk about it on the [CBS] evening news and intone how, providentially, the energy problem has been solved. We as a community will look stupid."

Garwin says that he was troubled by the quality of the research. The version of the paper he saw described how the authors constantly adjusted the experimental setup to keep it tuned properly—conditions ripe for allowing unconscious bias to seep into the data. Given these concerns, he says, "it would be unfortunate if *Science* magazine were to take any position on its correctness."

Kennedy says that publication in *Science* certifies only that Taleyarkhan's paper has cleared the magazine's own peer-review and editing process. After that, it's up to the scientists. "We're not wise enough to certify that every claim will stand up to the active effort of replication," says Kennedy.

The importance of replication, apparently, is one of the few things on which everybody can agree. "There's some small chance that they're right," says Happer. "It should be published. The truth always comes out." Taleyarkhan takes the same position, although he hopes for the opposite result. "I'm looking forward to helping people reproduce the experiment," he says. But until then, confusion, not fusion, is likely to reign.

–CHARLES SEIFE

CREDIT: (BOTTOM) AMY HISE

INFECTIOUS DISEASE

New Culprit Emerges In River Blindness

For decades, people have blamed a parasitic nematode for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit—or at least an accomplice—may be the ubiquitous *Wolbachia*, bacteria that colonize many hundreds of species, including the nematode indicted in river blindness.

On page 1892, researchers report that *Wolbachia* stimulate the severe immune system response that slowly robs people of their vision in areas where the disease is endemic. The work "is one of the most exciting things that's happened in the past 10 years" in research on parasitic nematodes, comments Jan Bradley, a parasitologist at the University of Nottingham, United Kingdom. It "sheds a different light on the pathology of this disease," and it has already sparked debate about how big a role this bacterium really plays.

River blindness begins with repeated bites from black flies that are common along rivers and streams in tropical areas. The insects transmit nematode larvae that settle under the skin, mature, and produce millions of young

Occupied territory. *Wolbachia* (red) thrive in the filarial worms blamed for river blindness.

larvae called microfilaria. Those of the species *Onchocerca volvulus* travel through the skin to the eyes, where they remain in the microfilaria stage and die after about a year. A victim of the disease can have "hundreds of worms wiggling in the eye," says Bradley.

Parasitologists have long assumed that the nematodes cause the inflammation that damages the eyes and cornea, probably by

releasing proteins when they die that spark an immune reaction. The drug currently used to fight river blindness kills larvae, which slows the course of the disease but doesn't cure it because the adults remain.

Wolbachia, by contrast, garnered little attention, although researchers have known for some 30 years that they live inside the worms. In the late 1990s, parasitologists demonstrated that the nematodes need these bacteria to reproduce, and researchers began to wonder what would happen if they killed the bacteria. Last year, Achim Hoerauf, a research physician at the Bernhard Nocht Institute for Tropical Medicine in Hamburg, Germany, found that in infected people, antibiotics kill the bacteria and interrupt the parasites' life cycle.

"The question then was what role might the bacteria be playing" in river blindness, says Eric Pearlman, an immunologist at Case Western Reserve University in Cleveland, Ohio. To find out, his group teamed up with Hoerauf and Mark Taylor, a parasitologist at the University of Liverpool, U.K.

In one experiment, the German team sent Pearlman extracts of worms taken from either untreated patients or those who had received antibiotics. In the latter group, the antibiotic had killed most of the *Wolbachia*, leaving a solution of worm proteins devoid of bacterial ones. When Case Western's Amélie v. Saint André injected the extracts into the eyes of mice, she and her colleagues found that the worm-plus-*Wolbachia* extract caused much more damage, judging by how hazy the mice's eyes became, than worm proteins alone.

Pearlman and his colleagues tested additional extracts, this time supplied by the Liverpool team. These came from two other filarial nematodes, one that doesn't carry *Wolbachia* and one that does. Only the latter clouded the mice's eyes. "It looks like *Wolbachia* is really causing a lot of the problem," comments Barton Slatko, a molecular parasitologist at New England Biolabs in Beverly, Massachusetts.

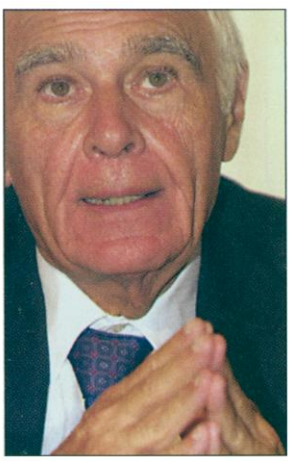
Thus it seems that "if one were to treat [patients] with antibiotics, potentially these microfilaria would no longer be able to incite an inflammatory response," notes Thomas Nutman, a parasitologist at the National Institute of Allergy and Infectious Diseases in Bethesda, Maryland.

But as Nutman and others point out, it's not yet clear how practical or effective these antibiotics might be. Microfilaria proteins may also play a role in the disease. And Eric Otteson, a clinical parasitologist at Emory University in Atlanta, notes that the extracts came from dead or dying adult worms and not from the juvenile microfilaria that colonize the eye. Thus, he says, the researchers have made "a leap of faith" in assuming that extracts of larval proteins would have the same effect. Nonetheless, many parasitologists view the international team's effort as an important step in understanding a disease that deprives hundreds of thousands of people of their vision. **–ELIZABETH PENNISI**

AIDS RESEARCH

Delays Jeopardize Italian Program

With a queasy sense of déjà vu, Italian AIDS researchers are bracing for severe funding cuts for the second time in less than 2 years. Only this time, their plight is even more dire: As *Science* went to press, Prime Minister Silvio Berlusconi's government had yet to allot any funds for the national AIDS program in its 2002 budget. To make matters worse, a series of freezes and delays has prevented most researchers from receiving grants awarded for 2001.



Where's the beef? Girolamo Sirchia had promised to fund AIDS program.

CREDIT: PIER PAOLO CITO/AP

Annual funding for the AIDS program, which peaked at nearly $14 million 6 years ago, now stands at about $11 million. But extracting that money from the government, which has changed hands once a year on average since World War II, is another matter. "It has taken a little miracle to get this funding each year," says Stefano Vella, chief of clinical AIDS research at the National Institute of Health in Rome and president of the International AIDS Society. In 1997, then–health minister Rosy Bindi froze the funds for several months. Then in 2000, she proposed slashing the AIDS research budget by 36% (*Science*, 7 July 2000, p. 28). Although the government of former Prime Minister Giuliano Amato reversed that cut, the money is again on the chopping block.

Italian scientists have been lobbying current health minister Girolamo Sirchia—who has overall responsibility for the program—and Berlusconi's deputy prime minister, Gianfranco Fini, for a budget at least at the 2001 level. Speaking last December in Milan on World AIDS Day, Sirchia promised that the money would be forthcoming. But since then, Vella says, "we have not seen anything." Nor have Sirchia and Fini replied

ScienceScope

Thou Shalt Share The National Institutes of Health (NIH) has released long-awaited draft guidelines on data sharing.

Worried that taxpayer-funded researchers might hoard data to the detriment of science, NIH officials are asking potential grantees to propose how they plan to share the fruits of their labor. NIH says it may provide extra cash to researchers who need help assembling publicly accessible databases or creating other distribution tools. But the policy draft (grants2.nih.gov/grants/policy/data_sharing/index.htm) emphasizes that the government has no wish to stand in the way of patenting potentially valuable discoveries, giving scientists up to 60 days to keep secrets while legal papers are finished. NIH is asking for comment by 1 June, with implementation by 1 January 2003.

Plugging Holes NASA finally has a chief of biological and physical research—and soon may have a chief financial officer too.

NASA Administrator Sean O'Keefe named Mary Kicza to the research job 4 March after a nearly 2-year, unsuccessful hunt for a prominent outside researcher (*Science*, 12 May 2000, p. 938). Kicza, an electrical engineer with a master's in business administration, was associate center director at Goddard Space Flight Center in Greenbelt, Maryland, and was responsible for coordinating earth and space science efforts. Kicza's lack of a biological or physical research background, however, is sure to raise eyebrows in the life and microgravity sciences community. O'Keefe's statement tries to parry that anticipated criticism by noting that Kicza has managed a diverse portfolio of research agendas for 2 decades. She will work closely with Shannon Lucid, a shuttle veteran recently named NASA's chief scientist.

O'Keefe also is likely to soon name Steve Isakowitz to the space agency's top budget slot. Isakowitz is currently an influential civil servant at the White House Office of Management and Budget, where he oversees science and space programs. He has been quietly skeptical of NASA's outer planets exploration program and space station research efforts—two issues he will now tackle from the inside.

O'Keefe also named Frederick Gregory as the agency's chief of space flight. The longtime astronaut will oversee the troubled space station program.