

Blown away. Seasonal ups and downs in particle detections were not due to a dark-matter "wind," a new study shows.

Rita Bernabei of the University of Rome, a physicist with the DAMA collaboration, says differences in the two detectors make a direct comparison between the results misleading. But other researchers say EDELWEISS has all but put the matter to rest. "For the first time, you exclude this DAMA positive evidence for dark matter," says Michel Spiro, also at CEA Saclay. "I'd prefer that it was confirmed than excluded, but this is important physics."

Yorck Ramachers of Oxford University suspects that DAMA's seasonal variation is a systematic error. The cumulative effects of annual cycles of temperature, humidity, and other factors might explain the "detection," he says. In any case, he says, several other dark-matter searches are likely to release data this year, so those who were rooting for the DAMA result might soon have fresh puzzles to console them. —CHARLES SEIFE

INFECTIOUS DISEASE

Cholera Strengthened By Trip Through Gut

Poor sanitation promotes the spread of cholera, but that's not the only way humans foster the deadly diarrheal disease. Microbiologists have discovered that the human gut seems to prime the bacteria responsible. Before *Vibrio cholerae* exit the body in watery stools, something about the intestinal environment causes them to rev up the activity of certain genes. These genes, in turn, seem to prepare them for ever more effective colonization of their next victims, possibly fueling epidemics, says Andrew Camilli, a microbiologist at Tufts University School of Medicine in Boston.

"The hypothesis that passage through the host enhances infectivity is quite provocative," comments Matthew Waldor, a microbiologist at Tufts–New England Medical Center in Boston. Adds Vic DiRita, a microbiologist at

the University of Michigan, Ann Arbor: "It's really amazing. It may explain the rapid and explosive nature of these epidemics."

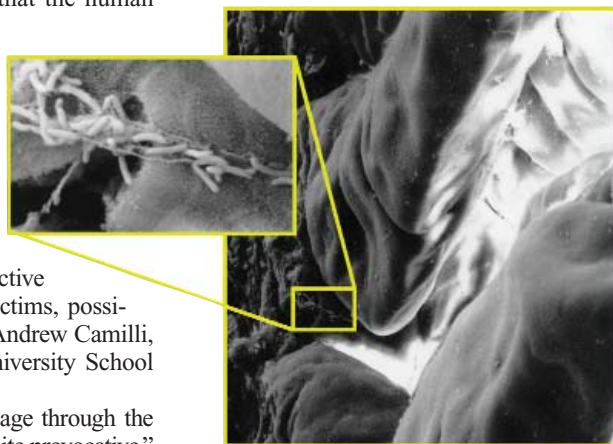
A thwarted experiment put Camilli and his colleagues on the trail of this so-called hyperinfectivity. He and others had long wondered why cholera epidemics become rampant as quickly as they do. Camilli thought the microbes residing in the human gut might develop defenses against the gut's acid environment. As a result, more of the excreted, acid-tolerant bacteria would survive in subsequent hosts. But when the researchers went to Dhaka, Bangladesh, to get fresh *Vibrio* to test this idea, technical difficulties foiled the experiment.

Instead, graduate students Susan Butler and D. Scott Merrell, who is now at Stanford University School of Medicine, made a peculiar observation. While in Bangladesh, they injected mice with a mixture of bacteria grown in the lab and isolated from human stools. The stool-derived bacteria greatly outcompeted the lab-derived bacteria, the researchers found, calculating that the former were up to 700 times more infectious than the latter.

This increased infectivity lasted at least 5 hours in bacteria living in pond water—long enough for someone to drink the infected water, says Camilli. However, the hyperinfectivity disappeared when the microbes were grown more than 18 hours in the lab, the team reports in the 6 June issue of *Nature*.

To understand what made excreted *Vibrio* different from their laboratory counterparts, Camilli and Stanford microbiologist Gary Schoolnik looked for changes in gene expression. They exposed a microarray made with pieces of *Vibrio*'s genes to *Vibrio* RNA isolated from fresh stools or lab strains. Some 3120 of the 3357 genes studied were equally active. But in the stool-derived sample, 44 genes were more active and 193 were less active.

When the researchers looked at the most logical suspects for increased infectivity,



Pathogenic squatters. In this mouse small intestine, *Vibrio cholerae* bacteria (inset) have latched onto cells lining the gut.

ScienceScope

Prying Open the Board Federal legislators are urging the governing board of the National Science Foundation (NSF) to conduct more of its business in public—or else. The U.S. House of Representatives this week was expected to pass an NSF authorization bill that calls on the agency's in-house watchdog, the inspector general (IG), to ensure that the board is complying with all relevant federal statutes pertaining to open meetings.

The House vote follows a Senate hearing last month at which Senator Kit Bond (R–MO) told atmospheric scientist Warren Washington (right), newly installed as chair of the National Science Board, "to avoid the heartburn and take care of the matter before it becomes a problem." Washington replied that he was "philosophically" in favor of "doing as much business as possible in the open" but that he needed to check with NSF officials before giving a fuller answer. IG Tina Boesz says that her office has started to look into the matter in anticipation of a formal request from Congress.

Image not available for online use.

Let the Race Begin This week, at a meeting in France, the partners in the \$4 billion International Thermonuclear Experimental Reactor (ITER) were to formally submit their candidate sites to host the mammoth fusion experiment. Japan, the favorite, last week announced its choice of Rokkasho, a village in Aomori Prefecture about 540 kilometers north of Tokyo that is already home to a controversial nuclear fuel reprocessing plant. The European Union was expected to offer two candidates: Vandellós, near Barcelona, the site of a shuttered nuclear plant; and Cadarache, near Aix-en-Provence, next to France's main nuclear power research facility. A private Canadian group is pushing a site in Clarington, near Toronto.

The winner, to be chosen by the end of the year, is supposed to be the best site within the country willing to pick up the largest share of the tab. Each potential host has a huge financial stake in the decision. The Aomori provincial government, for example, expects to reap some \$10 billion in economic benefits over the expected 30-year lifetime of the project.

Contributors: Philipp Weiss, Gretchen Vogel, Jeffrey Mervis, Dennis Normile and Xavier Bosch