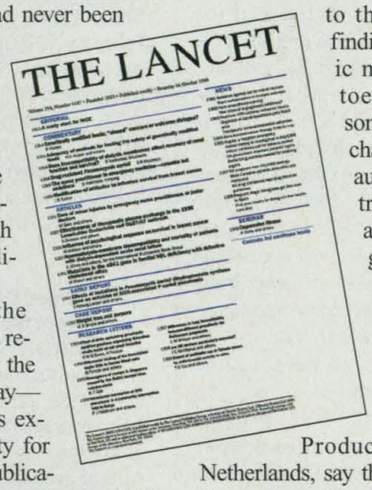
tral. The advertising will be "exquisitely" targeted to specific groups of readers, authors, and peer reviewers who use the company's services. Williams hopes to name an editor and editorial board soon.

–ELIOT MARSHALL

TRANSGENIC FOOD DEBATE

The Lancet Scolded Over Pusztai Paper

For more than a year, a study claiming to show that transgenic potatoes may make rats sick was at the center of a furious debate, even though its findings had never been published. Now, part of the controversial study by protein biochemist Arpad Pusztai has finally made it into the pages of *The Lancet*—only to drag the prestigious journal down into the trenches of the British war over genetically modified food.


THE LANCET

Critics—including the Royal Society, which after a review of the raw data called the work "deeply flawed" in May—contend that *The Lancet* is exploiting the study's notoriety for its own publicity and that publication in a top journal lends the paper credibility it doesn't deserve. The U.K.'s Biotechnology and Biological Sciences Research Council called the journal "irresponsible." But *The Lancet* editor Richard Horton says that giving Pusztai's data a public airing finally allows all parties to draw their own conclusions. Besides, he says, the paper survived an even stricter scientific scrutiny than normal.

The study made headlines around the world in August 1998, when Pusztai, a scientist at the Rowett Research Institute in Aberdeen, announced in a television interview that a diet of genetically modified (GM) potatoes could stunt rats' growth and impair their immune system. Just days later, the institute suspended Pusztai and banned him from speaking to the media, saying his claim lacked a scientific basis—a verdict later repeated in an internal review. But an international group of scientists, after examining data provided by Pusztai, demanded his exoneration (*Science*, 19 February, p. 1094). Their stance fueled the British media frenzy over transgenic crops and turned Pusztai, who is now retired, into a hero for the anti-GM movement. But what his study had or hadn't shown, remained unclear.

In their paper in the 16 October *Lancet*, Pusztai and co-author Stanley Ewen, a pathologist at Aberdeen University, don't mention stunted growth or suppressed immunity. Instead, they focus on abnormalities in the intestines of rats fed only potatoes equipped with the gene for GNA, a natural insecticide found in snowdrops. GNA and other lectins are thought to be potentially useful in helping crops fight off insects, but products engineered to express the gene haven't made it to the market yet. The researchers found that rats on the transgenic spud diet for 10 days had a thickening in the mucosal lining of their colon and their jejunum, a part of the small intestine, which didn't occur in animals fed nontransgenic potatoes or nontransgenic potatoes spiked with GNA at levels comparable to the transgenic ones. The findings suggest that the genetic modification of the potatoes—not GNA itself—is somehow responsible for the changes seen in the rats, the authors say. "Perhaps by introducing a gene you will activate or silence other genes in the plant as well," Pusztai explains.

But in a commentary in the same issue, three scientists from the National Institute for Quality Control of Agricultural Products in Wageningen, the Netherlands, say the study has several flaws. For instance, the effects could have stemmed from nutritional differences between the potatoes that had nothing to do with genetic modification; with just six rats in each group, the sample size was very small; and the monotonous diet had made all the rats protein-starved—not a good basis to assess a substance's toxicity, they argue. As a result, the Dutch scientists say, the data don't warrant the paper's conclusion. Pusztai, however, points out that the diets were comparable in protein and energy content and that a sample size of six is perfectly normal in studies like this.

Nevertheless, critics say the shortcomings should have caused the journal to reject the paper. John Pickett of the Institute of Arable Crops Research in Rothamstead, one of the experts asked by *The Lancet* to assess the paper, last week cast off peer reviewers' traditional cloak of secrecy and publicly denounced the journal for ignoring his advice. "If this work had been part of a student's study, then the student would have failed whatever examination he was contributing the work for," Pickett railed in a BBC interview.

Horton responds that the journal put the paper through an unusually rigorous review, asking six instead of the usual three experts to examine it. Of those, only Pickett squarely opposed publication, he says; four others raised criticisms that Pusztai and Ewen addressed, while a fifth deemed the study flawed but favored publication to avoid suspicions of a conspiracy against Pusztai and to give colleagues a chance to see the data for themselves. "When we had five out of six reviewers in favor of publication … we felt we had very strong grounds to go ahead and publish," says Horton, who also justified his decision in a commentary. Horton denies that *The Lancet* sought to get mileage out of the media hype, insisting that he would have printed the paper even if it hadn't been mired in controversy. But Marcia Angell, editor-in-chief of *The New England Journal of Medicine,* a competing journal, finds that hard to believe. "When was the last time [*The Lancet*] published a rat study that was uninterpretable?" she asks. "This really was dropping the bar."

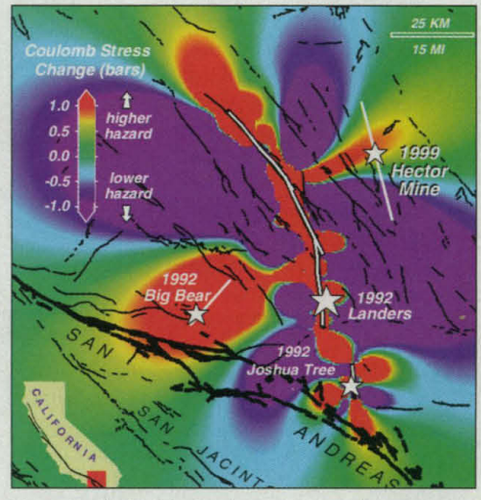
Horton says he sees nothing wrong with publishing a provocative paper: Arguments over a scientific study are "perfectly normal." "The problem is we are disagreeing about interpretation in this incredible crucible of public debate," he says. "I think everybody needs to cool it."

–MARTIN ENSERINK

SEISMOLOGY

Did One California Jolt Bring on Another?

No crustal fault is an island, seismologists are learning. Last weekend's Hector Mine earthquake, which struck the desert 160 kilometers northeast of Los Angeles, seems to support the idea that faults feel what happens to their neighbors. The magnitude 7.1 temblor—which did minimal damage because of its remote location—appears to have been triggered by the magnitude 7.3 Landers quake of 1992, which struck 160 kilometers to the east of Los Angeles. "There's clearly a relation" between the Landers and Hector Mine quakes, says seismologist Lucile Jones



SOURCE: R. STEIN/USGS MENLO PARK

Nattering faults. The Landers quake may have set off both the Big Bear and the Hector Mine quakes.