

that genes play some role in behaviors. Behavior, after all, comes from thought, which comes from the brain. The brain runs on neurotransmitters (chemicals that carry messages from one neuron to another) and receptors (sites on neurons at which neurotransmitters dock, like spacecraft on a space station). Both neurotransmitters and receptors are made according to instructions in genes. But it's a long way from these connections to "genes determine behavior." For one thing, environment influences which of the body's 100,000 or so genes are turned on: like a computer hard drive loaded with programs, only the one opened by a click of the mouse runs. So it is with genes. Take schizophrenia. Someone growing up in bucolic environs may carry the exact same "schizophrenia" genes as a kid in South-Central. Since stress increases the risk of schizophrenia, the denizen of the inner city will develop the disease but his country cousin will not, explains psychologist Irving Gottesman of the University of Virginia. If one twin is schizophrenic, his identical twin is schizophrenic only about 48 percent of the time: the environment has not "opened" his disease genes.

Because of such complications, behavioral genetics is moving from OGOD to the idea that no single gene is sufficient for a complex trait. Genes are propensities and probabilities, not destiny. But science has not heard the end of these claims. In July, at Jackson Laboratory in Bar Harbor, Maine, NCI's Hamer described his research on genes linked to neuroticism, a trait he called "much more heritable than [a susceptibility to] breast cancer." The gene is involved in the brain's serotonin system, he said. A paper on the "neurotic gene" will be published in the journal *Science*, according to one source, sometime in the next few months. The public, and the press, will likely eat it up, as they have earlier claims of behavioral geneticists. As philosopher Philip Kitcher of the University of California, San Diego, says, "The seduction of a simple explanation for complicated problems is the strongest force driving this field." But keep your ears pricked. Cries of "OGOD" will continue to echo throughout the land. ■

## HEALTH

# Goodbye to the Goober

## Peanut allergies have schools banning the butter

BY JOHN SEDGWICK

**W**HETHER YOU WOULD HAVE THOUGHT that good old PB&J could be a health hazard? Sad but true: the peanut-butter-and-jelly sandwich is under assault, along with its cousin the fluffier nutter, the peanut-butter cracker, the Reese's Piece, the peanut M&M and all the other delectable forms the humble peanut comes in. At the Breck School in Minneapolis, PB&J sandwiches must now be eaten at separate tables. The Bradstreet Early Childhood Center in North Andover, Mass., is one of many kindergartens to have created peanut-free classrooms this fall, and the Trinity School in New York City has expelled all forms of the peanut from the premises.

Why the frenzy over goobers? Because 1 percent of American children are now estimated to have a peanut allergy. Roughly 100 Americans die from all food allergies every year, according to the Food Allergy

Network, and the peanut is the top

killer on the list. While most reactions are far from fatal, kids are the most susceptible, and many schools are unprepared for the speed and severity of the attacks. "I think of it as a nuclear explosion," says Dr. Hugh Sampson, a food-allergy special-

### A classic questioned:

*PB&J sandwiches could pose a health risk to 1 percent of all children*

ist at Johns Hopkins Medical School. In some cases, just touching peanut butter can cause hives, and the tiniest taste can induce anaphylactic shock, killing a child in minutes. (Worried parents should take their child to a board-certified allergist for testing.) Before she realized that her daughter was allergic, Trisha Warringer of North Andover let the 3-year-old spread some peanut butter on a cracker for her brother. "I turned around and she was all blown up, every part of her, and her eyes were swollen shut." Warringer's daughter recovered, but others have not been so lucky. A 15-year-old with peanut allergy died in August on a Connecticut sidewalk after she ate a piece of coffee cake she'd thought was safe.

The number of children with peanut allergy appears to be growing. Sampson says it may have doubled in the last 10 years. The allergy requires a genetic predisposition, but allergists suspect the genes are more likely to kick in if youngsters are exposed to peanuts before their immune systems are fully developed at the age of 3. And many now are: in one study by San Diego pediatric allergist Robert Zieger, every one of the 185 subjects had been fed a peanut product by the age of 2. Because of their very ubiquity, peanuts are extremely difficult to guard against—especially since it can take only a speck to produce a reaction. Even after discovering her daughter's allergy, Warringer still had to rush her to the emergency room four times this summer. In one case, a piece of plain chocolate set her off, apparently because, back at the factory, it had been touched by machinery that had also come into contact with the peanut variety.

The food industry says it's doing its best to label peanut foods clearly and prevent accidental cross-contamination of other foods. Some critics of peanut bans say they offer a false sense of security, and that the best precaution is for allergic kids to be on the alert themselves. That might have to wait until the kids can read, however. Schools may also be inadvertently stigmatizing the allergic kids, some of whom have been taunted on playgrounds with peanut-butter sandwiches thrust at them like knives. But if schools do nothing, kids could be endangered. And it seems only fair that kindergarten not be hazardous to children's health. ■

